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Contents

- 1 SC + CPM:
A Climate
Practicum
- 2 Temperature
Measurements
Compared
- 5 AASC Meeting
- 7 Satellite
Analysis
Charts

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State
Climatologist

SC + CPM: A Climate Practicum

On April 12-13, 1989, I attended one of the most enjoyable and informative meetings of my life as a climatologist. We hosted a meeting of the National Weather Service's Cooperative Program Managers for Colorado and nearby states.

Participants included Ray Kowrach (CPM for Wyoming), Mike Elias (veteran CPM for eastern Colorado, western Nebraska, and western Kansas), Mike Asmus (rookie CPM for western Colorado), Tom McKee (Colorado State Climatologist), Odie Bliss (Colorado Climate Center secretary), and myself (Colorado Assistant State Climatologist).

Our agenda was anything but formal. Activities ranged from installing a Fischer-Porter raingage to doing data quality validation. Other topics of discussion included comparisons of the MMTS (Max/Min Temperature System) to CRS (Cotton Region Shelter) data, long-term stations and the upcoming centennial celebration, computer hardware and software, NCDC data quality control, problems and

solutions to reduce inconsistency errors and data shifters, strategies for finding committed volunteers, and much, much more. Throughout the two-day get together, there was also time for plenty of laughing and storytelling. SCs and CPMs both seem to be an independent bunch of folks. Joke telling goes with the territory.

The goal of the meeting was to give the CPMs an opportunity to see what we do with the climate data they help gather. At the same time, we climatologists got a good dose of the down and dirty problems faced by the CPMs in maintaining quality data from volunteers during a period where volunteerism seems to be ebbing. We studied many observation forms and found many examples of the variety of problems that seem to always be creeping into the records. We kicked around ideas on improving training and stimulating interest by the observers. We talked about "time of observation" and how that affects the final summarized data. We probably all could have talked for another week or two. It seemed that everyone had something useful to contribute. But we also had our jobs to do, so the meeting had to terminate.

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

NATIONAL CLIMATIC DATA CENTER IN COOPERATION WITH AMERICAN
ASSOCIATION OF STATE CLIMATOLOGISTS

The CPMs are committed to the cooperative program ... It was very exciting to see their enthusiasm and sincerity.

Plans for a great Centennial celebration are being made.

Of greatest interest to the CPMs was the myriad of climate summaries that have been produced, and the huge number of climate requests that get answered using the data from the Cooperative Program. Time after time, they expressed the wish that the observers could see how much their data get used. They also were concerned about giving more attention to the good observers instead of putting all their energy into fighting the problems. The importance of data quality and consistency took on a different light after seeing how intensively the climate data are being scrutinized as scientists continue to investigate the issue of global warming.

A number of action items are beginning to occur as a result of this little meeting. Lists of long-term stations are being circulated in an effort to help preserve the most consistent climate records for the region. Copies of several graphical climate summaries developed by the Colorado Climate Center will be distributed to cooperative observers via the CPMs. Plans for a great centennial celebration are being made. The four-year study comparing the MMTS to CRS temperatures at Fort Collins may be expanded to some mountain locations. (The greatest differences between the two seem to occur on sunny days when there is complete snow cover. Therefore, it seems only logical to test the systems where snow cover is very prevalent.) A conscientious effort is underway to correct the many observers who currently shift their temperature and precipitation records to the wrong day on their observation forms. If successful, this could greatly improve and speed up the data

validation efforts at NCDC and the Colorado Climate Center. Finally, plans are already being made to make this SC/CPM gathering a regular event. All participants found the meeting to be very constructive and want to do it again.

The CPMs are committed to the cooperative program and are doing their best to gather the kind of data that we, as climatologists, want and need. It was very exciting to see their enthusiasm and sincerity. But they could use our encouragement and moral support. Their job is not an easy one, and just as the individual observers sometimes have trouble seeing what the value of their work may be, the CPMs may also struggle with that problem. Give them a pat on the back. Invite them to stop in when they are in your city and show them some of the analyses you have been doing with the cooperative data. Give them a chance to tell a few CPM stories. My guess is that you will both have a pretty good time, and you will both come out ahead.

Nolan J. Doesken
Colorado Climate Center

Temperature Measurements Compared

Of concern is the occasion when the kind of instruments and their housing change. The maximum (mercury) and minimum (alcohol) glass thermometers housed in a louvered, white, wooden box that stands about 54 inches above the ground have been in use in the United States for just about 100 years now. (Few American records are longer than this.) Thus, the majority of our historical records has been based on the glass maximum and minimum thermometers that are

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enclosed in this box called a "temperature shelter" or "Stevenson screen" (named for the father of Robert Louis Stevenson).

In the last year or two, however, a new piece of temperature sensing equipment, the Maximum/Minimum Temperature System (MMTS), has been introduced into the cooperative network by the National Weather Service. Some of us nicknamed the MMTS housing the "beehive", since there is a vague resemblance between the two. While the electronic sensor and its "beehive" housing have certain advantages, it does mean that a change in the equipment used has occurred. Along with the use of the "beehive" housing and the sensor, is the possibility that their introduction will result in an apparent climate change in our records due simply to the kind of equipment used.

In order to see if this might occur, we made a comparison between the two systems at the University of Minnesota St. Paul Campus Climatological Observatory. The comparison began in May 1987, and is still continuing. The results indicate that a higher maximum temperature (0.59°F) was obtained with the temperature shelter and glass maximum thermometer than with the MMTS. The average minimum was 0.87°F lower in the temperature shelter than with the MMTS. Thus, the mean daily temperature averaged 0.14°F less than the MMTS daily average.

Up to this point, the results just noted are the same as we reported in an earlier study. However, we have since realized that a bias exists between our maximum and minimum thermometers and the

MMTS sensor when they are reset to the current temperature after an observation has been made. This bias will undoubtedly vary from station to station and is not to be considered a constant. For our instruments, it was found that the bias at reset time was such that the maximum thermometer averaged 0.72°F warmer than the MMTS, and it in turn was 0.72°F warmer than the minimum thermometer. (The equality of the biases is unexpected and just a matter of chance.) When these biases were accounted for, the results were as shown in Figure 1-3. That is, on the average at our station, the daily maximum and minimum temperatures as recorded by the thermometers in the temperature shelter were now 0.13° and 0.14°F , respectively, lower than the MMTS maximums and minimums. Therefore, the mean daily temperature averaged 0.14°F colder with the old system than with the MMTS or "beehive".

The MMTS temperature sensor is smaller (it has less mass) and thus is quicker to respond to temperature changes than the larger glass thermometers. As a result, higher maximums and lower minimums should be expected with MMTS equipment. However, the data shown in Figure 1, 2, and 3 indicate while the MMTS maxima are slightly higher, the minimum temperatures recorded in our temperature shelter are slightly lower. This might be explained by the poorer ventilation within the shelter, since the daily minimum most often occurs in the early morning hours when low wind movement is a normal occurrence.

In slightly more than two years of comparison, there was no indication of a seasonal difference between the two temperature measurement systems.

Figure 1. Temperature difference in °F between the shelter maximum and the MMTS maximum for a given shelter maximum temperature.

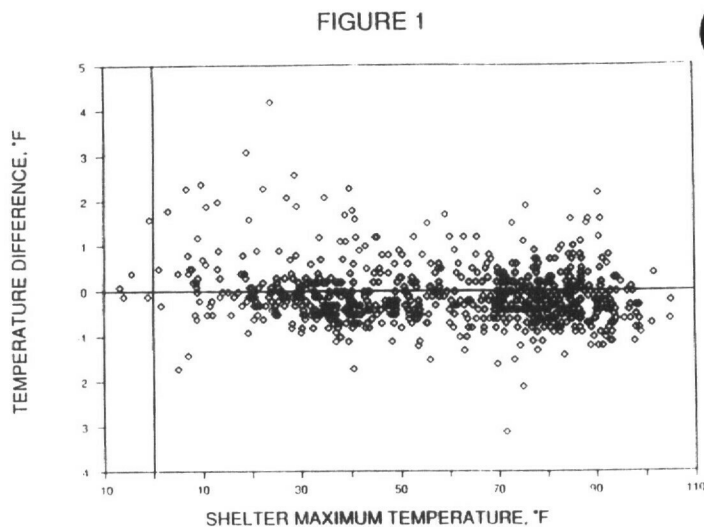


Figure 2. Temperature difference in °F between the shelter minimum and the MMTS minimum for a given shelter minimum temperature.

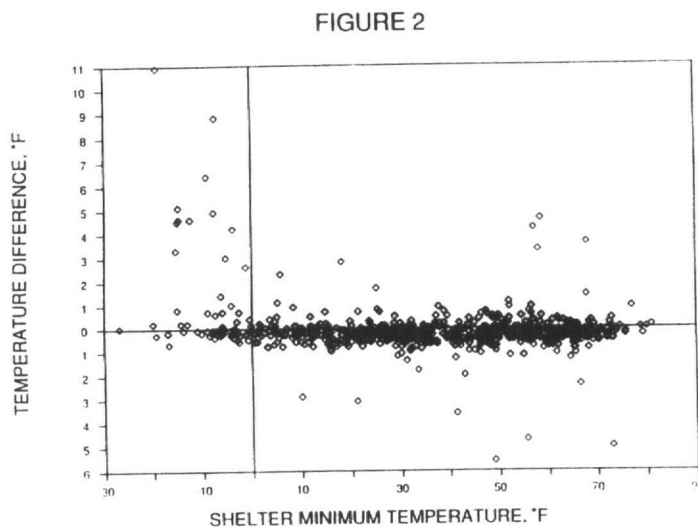
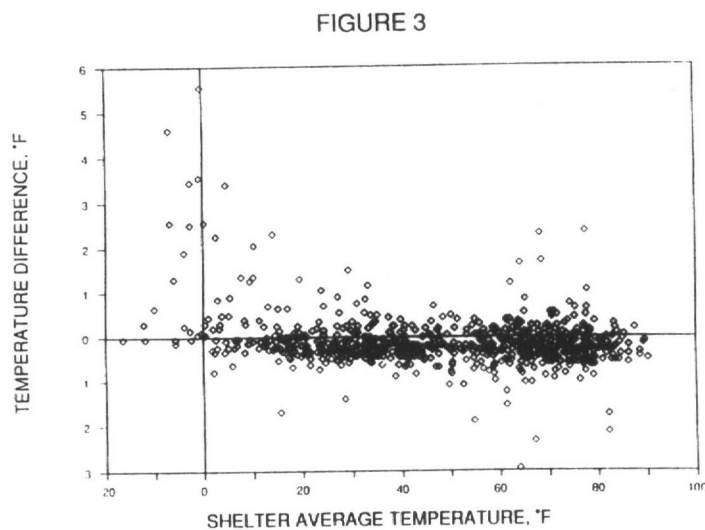


Figure 3. Temperature difference in °F between the shelter mean and the MMTS mean for a given shelter mean temperature.



AASC meeting covers topics from new satellite observing systems to new perspectives on data streams.

These comparisons do not show us, nor are they intended to show, which is the more accurate. However, the new system (which could very well be the more accurate of the two) could easily introduce a change in our records; a change that will not be due to the climate, but the result of the introduction of the MMTS or "beehive" into our climatological networks. In order to determine the effect of this new system, the two methods of temperature measurement should be recorded side by side for several years at a number of stations so that an adjustment factor can be determined and introduced into the records. In this way, there will be less chance for a false climate "change" to become a part of our historical climatic records.

Donald G. Baker
David L. Ruschy
University of Minnesota

AASC Meeting

The 1989 meeting of the American Association of State Climatologists was opened July 8, 1989, at Bar Harbor, Maine, by the Association's president Wayne Wendland. Through the course of that first day Wayne, and on the second day president-elect Kelly Redmond, introduced speakers from several branches of the National Oceanic and Atmospheric Administration, the United States Department of Agriculture, the Drought Information Center, the six Regional Climate Centers, and State Climatology Offices. The topics ranged from new satellite observing systems to new perspectives on data streams never intended for climate studies. For PCs, there will be "QC on the fly" as well as a reincarnated (but

improved) "TP40". Sandwiched between presentations, the Association's business meeting saw to matters requiring the decisions of its members.

The speaking program was started off with Ken Kunkel, who discussed some measures of variability recommended for use in addition to "normals". Alan Hecht of NCPO pointed out the administration-dependent uncertain future of climatology and the NCPO, and emphasized SC and RCC involvement in impact studies and risk assessment. The Regional Climate Centers each made presentations with many common themes including CLICOM use and training, and user services including special calculations on real-time information systems. Kelly Redmond explained an iterative quality control process involving NCDC, the Western Climate Center, and Oregon. Steve Doty of NCDC suggested possible award/recognitions and "focal" points for the Centennial Cooperative Observer Program. Tom Blackburn brought listeners up-to-date on a number of Coop issues including a return to a government-run Coop station maintenance program and the status of several MMTS issues. John Ball of OAR talked of a developing interest in climate within the research structures of NOAA and suggested that Mike Pall at 301-443-8415 could give further information on NOAA/OCAR overview of emerging high-tech sensors and associated acquisition hardware. Ken Hadeen of NCDC rounded out the first day by describing the reorganization of NCDC; new division heads needed; heavy PC use linked by LAN; international definitions, standards, and archival; and major pricing changes.

Kelly Redmond, introduced by Wayne Wendland (at that moment becoming the current

John Ball of OAR talked on a developing interest in climate ...

"past president") as the Association's president for 1989-90, started and presided over the business meeting held on the morning of the second day. Minutes and resolutions from the last meeting were dealt with briefly as the members turned to new business.

The formal decisions of the business meeting are presented here in the order in which they occurred. The Constitution (Title IV.2) was changed by the members to redefine voting members to also include "designated representatives of Regional Climate Centers." A legislative Study Group was formed to review existing and emerging legislation regarding global climate change and to recommend action to the executive committee and to members. Pat Michaels will chair that committee composed of the (new) executive committee and Claude Duchon, Harry Hillaker, John Purvis, Jim Laver, George Bomar, and Bob Muller. New Associate members Paul Croft, Bob Bermowitz, John Zeitzman, Ron McCall, and Frank Quinlan were approved by a voice vote. The only nomination for president-elect, Mark Shulman, and the recommendation that the Secretary-Treasurer, Jim Zandlo, be continued were unanimously approved. In a vote for preference, Atlantic City as chosen over Fort Worth as the site of the 1990 meeting (first half of August, a Tuesday through Thursday).

Other new business not resulting in any formal action included Tom Blackburn's suggestion that the AASC Secretary-Treasurer receive private contributions to a "Centennial Weather Station Fund." Kelly Redmond brought up long-term station continuity

problems to which was appended problems with data not originally designated for climatic use and problems associated with the replacement of traditional observations with automated devices. Kelly concluded this discussion by stating that as president he WILL write appropriate letters. Finally, insufficient interest was shown in holding the 1991 meeting in Hawaii during the time of a total eclipse of the sun.

Norton Strommen of USDA restarted the topical sessions by talking of viewpoints and activities associated with USDA's strategic plan including an expression of need to solve problems on an international cooperative scale. Again Ken Hadeen presents, this time about CLICOM system benefits, a new CLICOM version due this fall, and a CLICOM USERS' group. Greg McCurdy of Utah described his state's considerable and continuing investment of efforts within that system. Ian Barrie of the UK AG Weather Program gave some insights into another country's data systems and data requirements and into its budgetary milieu. Jim Laver of CAC described a broad range of activities and products designed to describe impacts of the climate. Norm Canfield told us everything we wanted to know (or is possible to know) in terms of numbers, dates, etc., about the imminent ASOS system. Steve Williams described a high-tech, global scale interdisciplinary NASA effort known as "Mission to Planet Earth." Finally, John Vogel of the NWS Office of Hydrology brought us back to the surface with new studies of probable maximum precipitation and other hydrologic studies which in one form will run on PCs and make TP40 a thing of the past.

In closing, Kelly Redmond notes

*Dr. Mark
Shulman named
President-elect.*

*Atlantic City
will be site of
1990 AASC annual
meeting.*

*A strong need
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regional services.*

*Twenty-four
Satellite
Analysis Charts
are now available
from NCDC.*

that Doug Clark, SC-Wisconsin, will be on sabbatical in Denmark for the next year and that a half-time student will attempt to keep things going there. Also, Oregon may lose funding for its SC position this year. Kelly urges that a strong need for state level SC style services will continue in spite of emerging regional services. Kelly also urges members to read, comment on, and respond to HR1880.

Wayne Wendland declared the 1989 meeting closed.

Jim Zandlo
Secretary, AASC

Satellite Analysis Charts

The National Climatic Data Center (NCDC) in Asheville began processing subscription orders for Satellite Analysis Charts in January 1989. These charts had formerly been available from the Satellite Data Services Division of NCDC. Seventeen weekly or monthly sea surface temperature and snow and ice charts from seven different series were available initially. These charts, produced by the Ocean Products Center, the Navy/NOAA Joint Ice Center, and the Synoptic Analysis Branch of the National Environmental Satellite, Data, and Information Service are sent to Asheville for distribution. In May 1989, NCDC began a subscription service for seven additional weekly or bi-monthly charts formerly distributed by the Ocean Products Center.

Since usefulness of the charts is time-critical to a large number of users, especially in the fishing industry, efforts to shorten the length of time from production in Washington to mailing from Asheville are

on-going. Most charts are sent via overnight mailing, and two sets of charts (Gulfstream and Thermal Analyses) are FAXed to Asheville on the day of production. Sets of the Gulfstream and Thermal Analyses are mailed from Asheville weekly. Other charts are mailed semi-monthly or monthly depending upon production times. Charts can be FAXed from Asheville to customers, but presently fees are very expensive: \$55.00 for a one-time FAXing or \$25.00 per week for a period of at least 3 months or longer. Work on making FAX available for customers to access on a daily basis is on-going.

Back issues for all of the subscription charts plus discontinued charts are available for varying periods from the archives which were transferred to NCDC at the same time as the subscription service. Back issue charts are \$1.00 each. Mailed chart size varies from 8 1/2 x 11 inches to 11 x 17 inches.

For more information, contact NCDC's user services or send for the brochure "Satellite Analysis Charts Available from the NCDC - June 1989."

Federal Meteorological Handbooks

The National Climatic Data Center is now servicing requests from the private sector for new Federal Meteorological Handbooks (FMH). Currently, two new FMHs are available for \$20.00 each plus shipping and handling.

FMH No. 2 - Surface Synoptic Codes

FMH No. 10 - Meteorological Rocket Observations

Contact NCDC user services for details (704-259-0682).

The U.S. delegation to the CCI-X meeting held in Lisbon, Portugal included (L-R) Ken Kunkel, Jay Fein, Ken Hadeen, and Dave Rodenhuis.



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