

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
WASHINGTON

February 26, 1957

IN REPLY, PLEASE ADDRESS
CHIEF, U. S. WEATHER BUREAU
WASHINGTON 25, D. C.
AND REFER TO
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MEMO

(Climatological Service Memorandum No. 58)

WASHINGTON, D. C.
2-26-57

MEMORANDUM

TO : Area and State Climatologists, Substation Inspectors, Field Aides, WRPCs, River District Offices, and Area Engineers. (With copies to Regional Offices for information)

FROM : Office of Climatology

SUBJECT: Climatological Service Memorandum No. 58

GENERAL

1. W. B. FORM 612-14A: We have long been aware of the existence of additional information which has a direct bearing on climate. Much of this observational data comes from instruments purchased by private interests, with the data recorded on forms of their own design.

The new form, 612-14A, is designed to help us obtain copies, in standard form, of as much "Supplementary" data as possible. Since it will usually be used to supplement Form 612-14, no provision has been made on 612-14A for maximum and minimum temperatures, and amounts and times of precipitation. Space is provided for current temperature and wind speed at various levels, and for soil moisture and temperature at various depths. Blank columns are included for other data. The Bureau will contribute the blank forms to any cooperator who in return will make one copy which can be filed at the National Weather Records Center.

A pad of the new forms will soon be sent to each State Climatologist for information and additional forms should be ordered from the Regional Administrative Office and distributed where appropriate to all persons with observational programs who agree to cooperate.

2. W. B. FORM 614-2: This form has been simplified to one sheet and will now replace W. B. Form 614-5 and 614-6. We wish to thank all State and Area Climatologists for their very helpful recommendations in this connection.

The revised form is now being printed and will soon be available at Regional Administrative Offices.

3. THERMOGRAPHS AT SUBSTATIONS:

Re: CSM No. 51, Item 10, and CSM 35, Item 1

The following memorandum on this subject has been issued to the Weather

Records Processing Centers:

"Our policy in regard to thermographs at substations is that we feel this provides an inexpensive way to extend our network of stations providing hourly temperature data, and that we should, at appropriate times, encourage their installation at strategic points in the "a" network. Because of the cost we do not expect to increase the number of thermographs at substations materially, however, we believe we can eventually divert some of our thermographs from first-order stations not in the 24-hour network. Accordingly, we do want to insure that all such records now received are properly annotated and documented.

"In a survey made in late 1952 we found that about 125-130 substations had thermographs, of which 41 were owned by the Weather Bureau. It is likely that these figures have not changed appreciably since.

"The WRPCs should take the following action to carry out this policy:

1. All cooperative observers known to have thermographs should be encouraged to turn the traces over to the WRPC when they finish with them.
2. Traces received at the WRPCs should be logged in and inspected for proper identification and for any malfunctioning of the instruments. Evidences of malfunctioning should be called to the attention of the observer.
3. The traces need not be compared with daily observations, except that they should be used to resolve obvious errors, discrepancies, or doubtful cases.
4. Traces should be forwarded to the NWRC on a monthly basis."

4. TEMPERATURE RECORDS: Newspapers and others occasionally play up items such as breaking of temperature records (sometimes only by a few tenths of a degree) or the highest (or lowest) temperature on a given day (Oct. 20th e.g.).

We have no objection to these stories when a significant record occurs but the fact that changes in exposure, environment, and instrumental equipment may easily account for more than the degree by which the record is broken, brings us to discourage wide claims of a newly established record unless a real record is established. Some satisfactory substitute wording has been suggested by L. A. Joos, Illinois State Climatologist:

"82 or 83 degrees on Oct. 12 and 13th are 'near record' or are among the hottest ever recorded at this time of year."

As he points out, the placing of undue emphasis on a single extreme value is not statistically sound.

5. COOPERATION WITH AGRICULTURAL MARKETING SERVICE: The AMS has a budget request in for funds to provide for additional staff at some of their Statistician's offices in order to allow for cooperation with us in a joint Weekly Weather and Crop Bulletin, especially in those states where we do not now have such cooperation. They hope to know by March or April if their request will be approved. In the meantime we should go a little slow in promoting cooperation in those states where we do not yet have it. Our long range goal continues to be to have AMS responsible nationally for the crop portion of the bulletin, with the Weather Bureau responsible for the weather portion.

6. SUBSTATION HISTORIES:

Re: CSM 55 Item 6

Substation histories have now been published for all except the following:

California	Hawaii
Idaho	Alaska
Pennsylvania	West Indies

An important step is to see that all subsequent changes are accurately logged so that each history may be kept up to date. Accordingly each WRPC will maintain a master copy in which all changes will be entered. Tentative plans call for printing supplements periodically (perhaps every 5 or 10 years). The WRPC copies will serve as a valid check against the Central Office record, prior to publication of the supplements.

We do not want State Climatologists to get involved in keeping a file of current substation histories. On the other hand they should be able to get up-to-date information about individual stations for which they have a specific need for the periods in between publication of the histories.

Where histories have not yet been published, or where later information is needed, perhaps sufficient information can be obtained from the index in the CD annuals, where station openings and closings are recorded. Transcopies could be made in a few individual cases where a specific need exists. We do not believe the State Climatologists' offices should maintain a complete file of their histories.

7. MEMO OF UNDERSTANDING: Two copies of a new type of Memo of Understanding will soon be sent to each State Climatologist's office. This agreement permits would be cooperators who do not have punching facilities to have the punching done at the NWRC on a trust fund basis.

8. SEPTEMBER MEETING OF THE NORTHEASTERN TECHNICAL COMMITTEE ON AGRICULTURAL CLIMATOLOGY: The following reports were presented at the September 1956 meeting of the above group (NE-35) at College Park, Maryland:

Report of Sub-committee on Precipitation (NE-35)

The following recommendations were made by the sub-committee and approved by the entire committee September 7, 1956.

I. Class limits for studying rainfall probabilities as follows:

<u>begin</u>	<u>end</u>	<u>begin</u>	<u>end</u>	<u>begin</u>	<u>end</u>
0.00	- 0.09	1.00	- 1.09	2.00	- 2.49
0.10	- 0.19	1.10	- 1.19	2.50	- 3.9
0.20	- 0.29	1.20	- 1.29	3.0	- 4.9
0.30	- 0.39	1.30	- 1.39	4.0	- 4.9
0.40	- 0.49	1.40	- 1.49	5.0	- 5.9
0.50	- 0.59	1.50	- 1.59	6.0	- 6.9
0.60	- 0.69	1.60	- 1.69	- - - - -	- - - - -
0.70	- 0.79	1.70	- 1.79	- - - - -	- - - - -
0.80	- 0.89	1.80	- 1.89	29.0	- 29.9
0.90	- 0.99	1.90	- 1.99		

It was decided that if a preliminary analysis showed these class limits were too small, two or more could be grouped to form larger classes. More definite recommendations will be made after preliminary analyses are completed.

II. Missing values will be calculated by the three point method developed by the U. S. Weather Bureau.

III. It is recommended that probabilities of rainfall be presented in tabular form rather than graphically. The exact nature of the tabulation to be determined at time of publication.

IV. There was considerable discussion, both by the sub-committee and the entire group, of the definition of "wet" and "dry" periods and as to how they were to be tabulated. The following were finally agreed upon:

The three following tabulations of dry periods will be made:

- (1) Three or more consecutive days with less than 0.01 inches of precipitation.
- (2) Three or more consecutive days with less than 0.10 inches of precipitation.
- (3) Three or more consecutive days with less than 0.20 inches of precipitation.

These "dry" periods are to be tabulated as occurring in 4-week periods. If a "dry" period extends from one 4-week period to another, it is assigned to the 4-week period in which there are the greatest number of days, if the split is 50-50, it is assigned to the 4-week period in which it started.

A second tabulation is to be made grouping the "dry" periods on a weekly basis. The "dry" period being assigned to the week in which the mid-point occurs.

V. The three following tabulations of "wet" periods will be made:

- (1) Three or more consecutive days with 0.01 inches of precipitation or more. (The Bureau's position on value of days with .01 precipitation has been explained to the Committee.)
- (2) Three or more consecutive days with 0.10 inches of precipitation or more.
- (3) Three or more consecutive days with 0.20 inches of precipitation or more.

VI. It was recommended that for the present no attempt be made to utilize the snowfall data on a regional basis. Much of the information on snow cover is not complete and where it is reported the probability of errors due to the difficulties encountered in estimating depths make it of little value. However, there are several areas, particularly Northern New England, where satisfactory records are available. In the areas where satisfactory data exist, a study will be made of snowfall amounts and length of time various depths of snow remain on the ground.

VII. Recommendations as to procedure to be used in establishing confidence limits to be placed on precipitation probabilities will have to wait further consultation with statisticians.

Report of the Subcommittee on Temperature (NE-35)

A subcommittee of the NE-35 Technical Committee was charged with suggesting temperature summaries to be made under contributing projects. The suggestions were made and, after modification during discussion by the Technical Committee, the following was moved and accepted by a vote:

1. Compute the mean daily maximum, minimum, and mean temperatures for each of the 52 weeks on the climatological calendar for each year. Compute the mean and variance of each of these weekly means using a sample of about 30 years.

2. Determine the last and first date of occurrence of 0, 16, 20, 24, 28, and 32°F. for each year in a sample of about 30 years. Compute the means and variances of each of the 12 dates using the 30 year sample.

3. Divide the climatological calendar into 13 - 4 week periods beginning March 1. For each of the 4 week periods and using about a 30 year sample determine the frequencies of 1, 2 n days with maximum temperatures greater than 90°F. Do the same for runs with maximum temperatures greater than 95 and 100°F. and for runs with minimum temperatures less than 0, 16, 20, 24, 28, and 32°F. Put a run in the 4 week period in which most

of it occurs; in the event the days of a run are evenly divided between 2 - 4 week periods, put it in the period in which it began.

4.. Divide the calendar into the same 4 week periods as in 3 above. For each of the periods, for days with minimum temperatures of 52 - 32°F. inclusive, and using about a 30 year sample, determine the frequencies of falls in the minimum temperature of 20°F. or greater during the following 24 hours. For each of the periods, for days with minimum temperatures of 42 - 32°F. inclusive, and using about a 30 year sample, determine the frequencies of falls in the minimum temperature of 10°F. or greater during the following 24 hours.

5. Divide the calendar into the same 4 week periods as in 3 above. Compute the number of "degree days" below 65°F. for each period for each year; compute the mean and variance of the number of these degree days for each period using a sample of about 30 years. In this same way, compute the means and variances of the number of degree days above 40°F. and above 50°F. for each period.

9. ACTIVITY OF NE-35: The following table, submitted by the Northeastern Area Climatologist indicates the status of the card punching program of the Regional Committee NE-35 on the Application of Climatology to Northeastern Agriculture:

<u>State</u>	<u>Cards Punched By</u>	<u>Number of Stations Selected</u>	<u>Number Already Punched</u>	<u>Analysis of Cards Started</u>
Connecticut	NWRC	8	8	yes
Delaware	State and U.S.W.B.	10	7	no
Maine	U. of N.H.	3	3	yes
Maryland	State and U.S.W.B.	5	3	no
Massachusetts	U. of N.H.	4	4	yes
New Hampshire	U. of N.H.	3	3	yes
New Jersey	NWRC	11	11	no
New York	NWRC	21	21	no
Pennsylvania	State	43	1	no
Rhode Island	U. of N.H.	1	1	no
Vermont	U. of N.H.	2	2	yes
West Virginia	NWRC	15	10	yes
		<u>126</u>	<u>74</u>	

10. MEETING OF COMMISSION FOR CLIMATOLOGY: The Commission for Climatology of the WMO held its second session January 14-25, 1957,* Considerable progress can be reported on a World Climatic Atlas, Guide to Climatological Practices, and International exchange of CLIMAT MESSAGES. Technical Regulations were reviewed and revised to conform with current practices. Working groups have been appointed for Statistical Requirements and

* in Washington D. C.

Practices, Regulations, Climatic Guide, Historical Weather Data, Climatic Classification and Dynamic Climatology, Derived Elements, Micro-and-Agro-Climatology, and Punch Card Layout. Mr. Veryard of the United Kingdom was elected President and Mr. Boughner of Canada, Vice President. On January 28-29 a tour of the National Weather Records Center was arranged for representatives of the 26 nations in attendance at the Commission meetings. A paper on "Preparing Climatic Data for the User" was presented to a scientific session of the Commission by Dr. Landsberg. A more detailed report of this meeting will be carried in a forthcoming issue of Topics.

11. USE OF ACETATE OVERLAYS FOR TABULATING DATA: Mr. Von Eschen, State Climatologist for New Mexico, has come up with a novel idea for the preparation of weather summaries for monthly and annual CDs, and in writing preliminary weather stories for news releases. This is passed on with the thought that the method may be of interest to other State Climatologists.

It is often desirable to compare substation data with normal or extreme values. For this purpose he obtained several sheets of clear acetate approximately 16 x 20 inches, bound with plastic tape. On the large climatological base map he has entered the normal values of temperature and precipitation for each station; also average maximum and minimum temperatures, extreme temperatures of record, greatest 24-hour precipitation, etc. This is the biggest part of the job, but once done the maps serve indefinitely. The various data are entered on separate maps for each month and for the year.

To compare current data with these averages or extremes, he places an acetate sheet over the appropriate base map and enters the current readings on the acetate sheet with wax pencil. Colored pencils used for departures or extremes makes the review easier. Each station value can readily be compared with the information shown on the base sheet.

He does not compare all elements each month, although the precipitation and mean temperature values are usually entered. Other comparisons depend upon whether there were unusual conditions during the period in question. As an example of the versatility of the procedure, he realized that the annual precipitation totals for 1956 would probably be the lowest of record over most of his state. Since he wanted to make the comparison as an aid in writing the annual summary, he prepared a base map showing the lowest annual rainfall of record for all stations with 10 years or more of record. When the 1956 totals were received from the WRPC it required but a short time to enter them on the acetate overlay and compare them with record values.

After the data on the acetate sheets have served their purpose the sheets can easily be wiped clean with a rag dampened with a suitable cleaner. He has found this method effective and time-saving.

12. SPECIAL DROUGHT ISSUE OF NATIONAL WEEKLY WEATHER AND CROP BULLETIN: We want to thank State Climatologists and all others who helped prepare the January 10, 1957 special drought issue of the Crop Bulletin. Unusually heavy demand has virtually exhausted our supply. Any office with surplus

copies of this issue is asked to send them to the Office of Climatology.

13. REVISION TO PUNCHING INSTRUCTIONS: For information of State Climatologists, the WRPCs have been requested to change punching instructions so that precipitation amounts interpolated by the 10 to 1 ratio may be indicated on the punch cards. The change affects paragraph 1009.411, Processing of Forms 1009 and Related Forms and reads:

Under the heading "Punch Instructions" for punching "day with" in columns 33-45 the new instructions should read " '1' in appropriate column for each occurrence, except for rain or snow (columns 33 and 34). If precipitation amount in columns 23-26 has been estimated from snowfall by the 10:1 ratio, punch x over 9 ($\frac{x}{9}$) in column 33. Leave any or all columns blank except for the codes noted above".

FOR WRPCs

14. AMENDMENTS TO PROCEDURES: The following changes to instructions have been issued to the WRPCs:

Paragraph 1009.615. Change the example given for carrying the name of the WRPC CD story writer to:

"John Doe
Climatologist
Weather Records Processing Center
Kansas City, Missouri"

(This will make this the same in monthly and annual CDs.)

Paragraph 1009.630. Change the last sentence to read: "When the same fastest mile (or fastest observed one minute wind speed) is recorded at a station on two or more days during a month, the direction and date of the first occurrence should be published with the plus symbol (+) attached to the date".

Paragraph 1009.6302. Where appropriate the following explanatory note should be carried with the double plus symbol (++) as a reference mark on the wind speed "Fastest observed one minute wind speed". This station is not equipped with automatic recording wind instruments.

1009.632. Change the sentence about "M" to read: If one or more days temperature record is missing, the reference "M" should be entered in the columns for average maximum or average minimum and to the average for the month. If less than 10 days record is missing, averages should be published, along with the reference "M".

Paragraph 1009.637. Delete last sentence referring to summer hail storms since reference for hail no longer applies.

Paragraph 1009.6371. Delete last two sentences.

Paragraph 1009.652. Change the first sentence in the water equivalent note to read: Water equivalent values published in Table 7 are the water equivalent of snow, sleet or ice on the ground. Samples for obtaining measurements are taken from different points for successive observations; consequently occasional drifting and other causes of local variability in the snowpack result in apparent inconsistencies in the record.

Change the note for "M" to read: One or more days of record missing; if average value is entered, less than 10 days record is missing. See Table 5 for detailed daily record. Degree day data, if carried for this station, have been adjusted to represent the value for a full month.

Add the double plus symbol (++) with the following explanation: Fastest observed one minute wind speed. This station is not equipped with automatic recording wind instruments.

1009.822. If one or more days record of either maximum or minimum temperature is missing, the letter "M" should be entered. If 9 days or less or either maximum or minimum are missing, the monthly mean should be entered with the referenced letter "M". If one month or more are missing, the annual column should be dashed.

1009.83. Change the note for "M" to read: One or more days' record missing; if average value is entered, less than 10 days record is missing. See monthly Climatological Data for detailed daily record.



H. E. Landsberg
Director, Office of Climatology

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