

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
WASHINGTON
April 24, 1959

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C-3.1



MEMORANDUM

TO : Area and State Climatologists, Field Aides (HC), Field Aides, WRPCs, River Forecast Centers, River District Offices, and Area Engineers (with copies to Regional Offices for information)

FROM : Office of Climatology

SUBJECT : Climatological Services Memorandum No. 71

GENERAL

1. CD WEATHER STORIES: Reference CSM No. 64, Item 1. A year has now gone by since the CD weather story was routinely a part of each monthly issue in Climatological Data.

During this year, 2 states had a story on unusual or outstanding weather each month while 2 had no story at all. Of the 540 monthly issues of Climatological Data, 202 carried a story and 338 did not.

Although some of our own people have expressed some concern about the discontinuance of these texts, there has been very little unfavorable reaction from the recipients. Less than a dozen written objections have been received here.

However, it must be emphasized that a story should be carried whenever unusual or outstanding weather occurs. It was never our intention that these stories be discontinued entirely; on the contrary, they should be used as a supplement to the tabular data whenever this is necessary to present an adequate picture of the weather over the state. Unusual weather conditions that extend over more than one month, such as a drought, an unusually cold winter, or an exceptionally wet spring, should also be considered for treatment in a C. D. weather story even though the conditions in the month ending the period may not be particularly outstanding. The decision on whether or not weather conditions warrant a story must be left to the good judgment of the State Climatologist.

There will be cases where a weather event may be unusual or outstanding in one state, and yet be either overlooked or not considered newsworthy in an adjoining state. In such cases the WRPC will serve a useful function by suggesting that a story be prepared when it would be inconsistent for the story to be missing for one state.

2. NATIONAL INVENTORY OF SOIL AND WATER CONSERVATION NEEDS: After discussions with some of the United States Department of Agriculture officials concerned with the National Inventory of Soil and Water Conservation Needs, Wayne C. Palmer of the Office of Climatology offers the following suggestions concerning the Weather Bureau's role in the program. These are merely suggestions

and no doubt the type of climatic information needed will vary a good deal from place to place. Special situations will, of course, require special attention. We realize that State Climatologists will not have the time to follow all or, in some cases, any of the suggestions below. These suggestions are given as guidance material for discussing the problem with Soil Conservation Service people and others, and for working up climatological data for the Inventory as time permits.

The National Inventory of Soil and Water Conservation Needs which has been undertaken by the United States Department of Agriculture is concerned, among other things, with adverse climatic conditions for which appropriate conservation practices are feasible. The climatic limitations are not to be confused with site limitations - such factors as location on a flood plain, periodically high water table, land configuration, etc. Under climatic limitations one can include such items as:

- a. moisture deficiencies
- b. moisture surpluses
- c. the length of the freeze-free period
- d. the number of days with significant amounts of precipitation
- e. the number of days with heavy precipitation
- f. the duration of dry spells
- g. the duration of wet spells
- h. the duration of hot spells
- i. the duration of cold spells
- j. the number of windy days

In almost every instance the concern is (or should be) with the probability of occurrence of the various items. However, such detailed information is not generally available and there is doubt that the Inventory procedures are set to make use objectively of such refined climatological information if it were at hand. It seems likely that monthly, growing season, or annual averages will suffice in most instances.

Basically, adverse climatic conditions can be summarized as too hot, too cold, too wet, too dry, or too windy at various times or for various uses. The items enumerated above all supply information on the occurrence of these limiting extremes. Of course, to be very precise one cannot answer a question concerning, say, too cold, unless one first asks, "too cold for what?" But this apparently goes slightly beyond the requirements for this particular Inventory.

Apparently, those making the Inventory are indirectly taking account of the moisture supply aspect in climates that are subhumid or drier by means of the land capability classification work which uses the 1931 Thornthwaite formula for precipitation effectiveness. (See Soil Conservation Service Memorandum 22, May 19, 1958, pages 17-18. This was sent to all State and Area Climatologists.) Of course it is well known that there are moisture deficit and moisture surplus problems in other climates. It seems likely that the United States Department of Agriculture could also make use of estimates of the average monthly moisture deficits and surpluses as computed by means of the 1948 Thornthwaite formula.

There are a number of other methods for computing water balance but considering the data available and the purpose, the Thornthwaite method will give a useful general estimate of average monthly moisture surplus and deficit. The simplest procedure, based on normals or long-term mean monthly temperature and precipitation, will suffice.

A technique for computing potential evapotranspiration was presented in the April 1958 Monthly Weather Review.

Unfortunately, our published tables of normals, means, and extremes fail to supply adequate information on most of the items enumerated above. However, the older Climatological Record Books do contain some information which is directly applicable to items d and e.

Each state or area will probably have to make its own definitions for "weather spells." It seems that in most places the comparative significance of dry spells would be represented by the average duration of the longest period during the growing season which provided less than 0.20 inch of precipitation in a single day.

Hot spells might be considered as the average duration of the longest period each year having daily maximum temperatures above 90°F. (This temperature is apparently a little above the optimum growth temperature of most plants.)

Cold spells of major agricultural significance could probably be considered as the average duration of the longest period during the growing season with daily mean temperature more than 10°F below normal. In some areas it may be that the period of most extreme cold in winter should be considered as the most important cold spell.

A wet spell is not easily defined, but useful information would be provided by the average duration of the longest period during the growing season having more than 0.20 inch of precipitation each day. Total precipitation during such periods would also be of interest.

One could arbitrarily define a windy day as a day with an average wind speed of 25 m.p.h. or more during two or more hours of the day. A more general statistic might be the percent of the time that the average hourly wind speed exceeds 25 m.p.h. during each month.

All the above may seem like a bit of an Utopian approach and it probably is. Neither the Weather Bureau nor the Department of Agriculture has the time or facilities to evaluate all these things in detail. But the information on climate will be used subjectively and probably exact answers to climatic questions would not be warranted. It may be that subjective answers are sufficient and that by thinking along the general lines outlined above, the State Climatologist can provide expert estimates of some of the items that the Inventory people are interested in.

3. CLEARANCE FOR PREPARATION OF CLIMATIC SUMMARIES: Reference CSM No. 64, Item 3. The Editor's Office has agreed with us that climatic summaries prepared in connection with SCS Soil Survey Reports (where an individual of the

Bureau is credited as author by name) may be cleared by the Area Climatologist rather than by the Central Office.

The last sentence of Item 3, CSM No. 64, should therefore be changed to read, "However, if an individual of the Bureau is credited as author by name, the paper should be cleared by the Area Climatologist before publication."

4. DEPTHS FOR SOIL MOISTURE MEASUREMENTS: The question of standardization of depths for soil moisture measurements is somewhat complicated. Form 612-14A was designed on the basis of point observations (by Bouyoucos or similar blocks) at proposed WMO standard depths. However, the program of observations by the Weather Bureau, which was being experimented with when the form was designed, was abandoned. At the present time, the data being collected and published are principally from sources such as Experiment Stations and are mostly in six-inch and one-foot increments with a few exceptions (which also do not fit the WMO recommendations).

At the recent Warsaw meeting, the WMO Commission for Agricultural Meteorology recommended that soil moisture be measured in 10-centimeter increments down to 100 centimeters or by layers from 0-10, 10-20, 20-50, and 50-100 cm. The earlier recommendation (CAgM-I, Paris, 1953) was for inclusion in the WMO Technical Regulations but it was omitted when the Technical Regulations were finally issued, so its status as an accepted standard is uncertain. The Warsaw recommendation is for inclusion in a proposed "Guide to Agricultural Meteorological Practices" which will not be issued until about 1961.

Therefore, while our eventual goal will be to conform to these proposals when they are formalized, we are not pressing for a change at this time. However, if new programs or new installations could be planned on this basis, it would be helpful to the long-range plan. We are actively pressing this in connection with soil temperature and a unified program is gradually emerging.

Instrumentation for soil moisture sampling is still a major problem and until we are in position to make more specific recommendations we see no objection to continuing to collect soil moisture data on the basis of present increments for the time being.

Attention is invited to the article "Soil Moisture Reporting" by Milton L. Blanc in the March 30, 1959 issue of the National Weekly Weather and Crop Bulletin.

5. CROP CALENDARS: In speaking of crop calendars we should make it plain that the term is slightly misleading, and that what is really desired is an agricultural weather problems calendar. The purpose of such a calendar is to alert the meteorologist to those aspects of weather and climate that are of agricultural importance at various times.

The crop calendar should be tied to the phenologic stages of the crop and to farm operations affected by weather. It may even be that the basic time scale should be in terms of phenologic events of the natural vegetation, with these events tied loosely to our Gregorian calendar.

At any rate the calendar should show weather requirements, hazards and problems. This is not easy to do; in fact, it is very difficult and requires a good deal of cooperative effort between the meteorologist, the county agent, the agricultural experiment station, and even some of the better local farmers. The Montana survey by Caprio is a good example of how some basic information can be collected. This was published as Montana State College Circular No. 22, August 1958, "A Survey of Weather Conditions Important to Agriculture in Montana" and a copy was sent to each State and Area Climatologist.

We hope the above remarks will clarify, somewhat, the problem of crop calendars.

6. RECOGNITION OF LONG SERVICE COOPERATIVE OBSERVERS: The February 26, 1959 issue of the Daily Weather Map, featuring 21 cooperative observers with 50 or more years of service, is discussed in two issues of "The Congressional Record".

In the March 2, 1959 issue Senator Ervin of North Carolina comments under the heading "Unsung Public Servants", pages 2815, 2816, 2817, and 2818.

In the March 4 issue in the Appendix under the heading "Maryland Voluntary Weather Observers Praised", remarks of Congressman John R. Foley are carried on page A1699.

Copies of the above map-back have been sent to supervising offices for distribution to all non-institutional cooperative observers.

7. STATUS OF THE BENCH-MARK PROGRAM: Reference Item 7, CSM No. 64; Item 1, CSM No. 55; and Item 2, CSM No. 48. Analysis of Winthrop College South Carolina data for homogeneity has been nearly completed. Work on this project has been temporarily delayed.

Raw bench-mark data from a number of the stations will be published in the Census Bureau's "Historical Statistics of the United States, Colonial Times to 1957," scheduled for release next October.

We hope to be able to move ahead with some more instrumentation for all bench-mark stations before long. First priority for purchase of new instruments will be given to soil thermometers and pyrhemometers.

8. DISCOMFORT INDEX: Under the date of March 2nd the Office of Climatology issued a Memorandum to all first order stations on the subject "Discomfort Index" and "Cooling Degree Days" with attachments. The News Room, Office of Public Information, Department of Commerce, issued a Science and Technology release on March 8th, subject "Weather Stations Will Figure Discomfort Index This Summer". This information release was given national publicity and it had created a flood of inquiries to this office. It is clear that this problem has much popular appeal.

In the near future you will receive copies of a Letter Supplement which will provide Discomfort Index values for a wide range of sums of simultaneous dry bulb and wet bulb readings. It will also include additional information on

the subject. Extra copies will be furnished so that they will be available for interested local television and radio commentators who could assist you in sampling public reaction and in determining the value of this idea for the local area. It is hoped that this concept will be found intriguing and be utilized in public information activities during the coming season.

9. CLIMATIC GUIDES: The Climatic Guide for New York City, New York, and Nearby Areas, Number 40-26 of the Climatography of the United States series, has recently been distributed to many Weather Bureau Offices. This 61-page issue treats the climate of this area in considerable detail. The previous prototype issue of the series was the one for Baltimore, Maryland, which was completed in 1956. Work is now going forward on the corresponding publication for the Chicago area. Any Meteorologist in Charge who feels that the New York Guide would be helpful at his station may request it from the Central Office Publications Section. A limited supply of the Baltimore Guide is also still available.

10. CHANGES IN STATE CLIMATOLOGISTS ASSIGNMENTS: Mr. Paul Waite, Wisconsin State Climatologist, has been selected as State Climatologist for Iowa. He plans to enter on duty at Des Moines about May 1.

Mr. C. R. Elford, who was State Climatologist at Des Moines, Iowa, is now State Climatologist at San Francisco, California.

11. WEEKLY WEATHER AND CROP BULLETINS: Since the local Weekly Weather and Crop Bulletins are the responsibility of the Agricultural Marketing Service, it will no longer be necessary to send a copy to the Central Office Library. Each State Climatologist is asked to have the Library removed from the mailing list. (One exception is the Bulletin for Puerto Rico, which is still issued by the Weather Bureau. In this case, a copy should continue to be sent to the Library.)

In all cases a file copy should be retained at the station, as outlined in the Appendix III, Volume I, Chapter I-F-39 of the Weather Bureau Manual.

We have recently received a few requests from State Climatologists for purchase of preprinted stencils for use in the bulletin. These stencils should be obtained by Agricultural Marketing Service since A.M.S. is responsible for furnishing all supplies. See memo of November 26, 1957, file C-3.1.

12. AMS-WB COOPERATION ON THE NATIONAL WEEKLY WEATHER AND CROP BULLETIN: Mr. James R. Kendall, Agricultural Statistician, has been assigned to other duties by the Agricultural Marketing Services and has been replaced by Mr. Melvin L. Koehn, formerly of the Sioux Falls, South Dakota, AMS Office. Mr. Koehn will spend two days per week in the Office of Climatology, assisting in the preparation of the National Weekly Weather and Crop Bulletin.

13. PUBLICATIONS NEEDED AT THE NATIONAL WEATHER RECORDS CENTER: The stock of separates of the following publications is completely exhausted at the NWRC:

Climatological Data National Summary 1953, Annual Summary
Monthly Climatic Data for the World 1952, April, May

Climatological Data for Illinois 1936, January 1951, March, May
 Climatological Data for Iowa 1937, Annual Summary

If any office has surplus copies of any of these publications, please forward them to the National Weather Records Center.

14. NUMBER OF COPIES OF "STORM DATA": All State Climatologists will regularly receive one copy of the new publication, "Storm Data". If more copies are needed for a particular month (unusually stormy weather, etc.), a memo should accompany Form 614-3 asking the National Weather Records Center for the desired copies for that month.

Since "Storm Data" will be of primary interest to only a small group of recipients, we do not anticipate a large list of subscribers. Anyone having regular need for this publication should be encouraged to subscribe for it.

15. CSM INDEX: An Index, covering CSMs 62 through 70, has been prepared and will be distributed.

16. PRESS CLIPPING SERVICE: While we have from time to time encouraged the use of press clipping services, we occasionally learn of cases where it has not been possible to obtain satisfactory service.

Quality of the service should be a primary consideration when clipping contracts come up for renewal.

17. W. B. FORMS 614-3 AND 614-9: State Climatologists should mail the Forms 614-3 (Storm Data and Unusual Weather Phenomena) and 614-9 (Storm Summary Report) in the same envelope to the NWRC. Present instructions are for these forms to be mailed not later than the 15th of the following month. We now realize that in some circumstances this mailing date is not always possible. Thus, whenever possible, we would like to have the above forms mailed by the 15th. However, the deadline is extended to the 20th under those circumstances where the earlier mailing date is not practicable.

After these forms have been forwarded to the NWRC, all changes or corrections should be directed to that office, not to Office of Climatology. If such changes are received at the NWRC after preparation of the data for publication is too far advanced, they will be included as "errata" or "delayed data" in the subsequent June or December issues.

18. PUBLICATIONS DISTRIBUTED TO STATE AND AREA CLIMATOLOGISTS AND WRPC'S: The following publications have been distributed since CSM #70 was issued:

Soils Memorandum (SCS 23) Revised "Climatological Services Available to States".

"Agricultural Drought in New England" by Robert S. Palmer.

Technical Bulletin No. 97, Agricultural Experiment Station, University of New Hampshire, Durham, New Hampshire.

"Trends in Climatology", H. E. Landsberg, reprinted from Science, Oct. 3, 1958, Vol. 128, No. 3327, pages 749-758.

"Interaction of Soil and Weather", H. E. Landsberg and Milton L. Blanc, reprinted from Soil Science Society of America Proceedings, Vol. 22, No. 6, November-December 1958, pages 491-495.

"The Origin of the Atmosphere", H. E. Landsberg, an article from Scientific American, August 1953, Vol. 189, No. 2 (distributed some time ago).

"The Climate of South Carolina Freeze Analysis", S. Car. Agricultural Experiment Station and U. S. Weather Bureau.

"A Survey of Weather Conditions Important to Agriculture in Montana" by J. M. Caprio, Montana State College, Circular No. 22, Agricultural Experiment Station, Bozeman, Montana.

"Bibliography of Translated Russian Articles and Publications", Foreign Area Section of Office of Climatology.

"Drouth - A Report on Drouth in the Great Plains and Southwest" (sent only to selected State and Area Climatologists and WRPCs).

"Field Measurements of Evapotranspiration as Related to Environmental Factors", University of Missouri.

"Whither Weather, Climate, and Agriculture?", National Academy of Sciences - National Research Council.

"Climatology - A Warehouse of Knowledge", R. W. Schloemer.

The second publication listed in CSM #68, Item 9, should be corrected to the following:

"Estimation of Rainfall Probabilities" by Friedman and Janes.

FOR WRPCs

19. AMENDMENT TO PROCEDURES: The following instructions have been issued to the WRPCs:

"Change paragraph 1009.824 of Procedures to read as follows: 'Table 3-- Extremes and Minimum Temperature Data'. Stations should be arranged alphabetically by state. Entries of extremes and dates in the first four columns should be in the following manner: 102 7-12 7 1-30. Entry of date and temperatures in the columns listing spring and fall minima should be as follows: 3-31 22. To determine the number of days between corresponding dates, for example, between May 29 (149th day of year) and September 22 (the 265th day), subtract 149 from 265 to obtain 116. This is the freeze-free period."


H. E. Landsberg
Director, Office of Climatology

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