

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
Washington, D. C.
June 30, 1956

C-3.1

MEMORANDUM

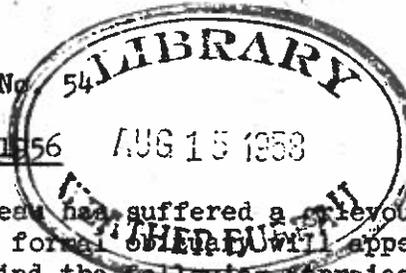
TO: Area and State Climatologists, Substation Inspectors, Field Aides, WRPC's, River District Offices, and Area Engineers. (With copies to Regional Offices for information)

FROM: Office of Climatology

SUBJECT: Climatological Service Memorandum No. 54

Robin E. Spencer, 1896-1956

AUG 15 1958



The climatological service of the Weather Bureau has suffered a grievous loss through the death of Mr. Robin E. Spencer. A formal obituary will appear in Topics. But his friends and colleagues may find the following appraisal of this kind man given by Claude Mahoney, Washington radio commentator, more revealing than a recount of dates and jobs held.

(Reproduced by permission)

"Once Over Lightly" this morning is not going to be so light, for there is a memory to be recalled... It is the memory of a weather man, and his death notice may have been seen by some of you in the newspapers. He was Robin E. Spencer, and he was Assistant Chief of the Climatological Services Division of the U. S. Weather Bureau. That was an inside job -- an office job -- and Mr. Spencer was not out hunting hurricanes... But he and I kept in touch with each other from time to time, for old times' sake... And here is the story of the beginning of the friendship with the weather man who was so much more than a weather man...

I was a reporter on the Indianapolis Star, and on a dull day the city editor sent me out -- as he did frequently -- to dig up a feature for the Sunday edition. I walked only a block and a half this time, and stopped at the office of the Weather Bureau in Indianapolis. It was on the top floor of a building on North Pennsylvania street. Well, I interviewed the weather man in charge -- and he was R. E. Spencer. (I never knew his real name was Robin for some years.) About the time I was closing my notebook on the weather something brought the conversation around to other subjects -- and I found to my surprise that Mr. Spencer was a writer as well as a meteorologist. He had already written the novel, "The Lady Who Came to Stay"... That meeting high up in the building -- and on the roof, too, where the instruments were located -- that meeting blossomed into a friendship...

Now, we must throw up some kind of a curtain to denote the passing of time... During that passing of time I came to Washington and went to work for the Wall Street Journal. On one day a week I had to hike over to the Weather Bureau building on M street and get a special weather report -- a crop report, really -- as it came off the printer. I had to dictate parts of that report to the Dow, Jones printer... On one of the first trips to that office I happened to look up and see my old pal from Indianapolis -- R. E. Spencer.

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He had been transferred to Washington, and we had lost track of each other... We caught up fast... "The Lady Who Came to Stay" was being made into a play, and he was going to New York to see the opening.. That called for a party at which Mr. Spencer met a number of my friends -- the strange kind of people outside the world of meteorology...

One time later, some of us were sitting on a terrace in a deep discussion of the weather and an argument developed... I happened to remember that we were not far from Spencer's house, and I just called him up. He came over and brought his books. He settled the argument and established me as a man who had authority behind him. In late years I had not seen Mr. Spencer so much, for I was cooped up more and more out here and he was cooped up more and more inside the Weather Bureau. Now and then I got a note about a piece he had written in the Weather bulletin... And my thoughts always went back to the top of that building in Indianapolis...

GENERAL

1. INFORMAL MINUTES OF 3RD MEETING OF ADVISORY COMMITTEE ON CLIMATOLOGY:

The Advisory Committee on Climatology, set-up under contract with the U. S. Weather Bureau by the National Research Council, met on June 14 and 15, 1956, at Columbus, Ohio. Local arrangements were made by the State Climatologist for Ohio, Mr. Leland T. Pierce. The meeting took place in the New Post Office Building. The general theme of the meeting covered the programs and activities of the Area and State Climatologists. Present at the meeting were the following:

Members of the Advisory Committee:

Dr. Thomas F. Malone, Chairman
 Dr. J. H. Longwell
 Dr. A. O. Kuhn
 Dr. W. A. Baum

(Dr. Church was absent in Europe)

Office of Climatology:

Dr. H. E. Landsberg

Area Climatologists:

Dr. Gerald L. Barger - North Central Area
 Mr. James K. McGuire - North Eastern Area

State Climatologists

Mr. A. Eichmeier - Michigan
 Mr. L. T. Pierce - Ohio
 Mr. L. A. Joos - Illinois
 Mr. C. R. Elford - Iowa
 Mr. L. A. Schaal - Indiana
 Mr. Nelson Kauffman - Pennsylvania.

As an introduction to the discussion Dr. Landsberg showed a map indicating the States which have full-time State Climatologists and others which at the

present have only part-time climatologists. He briefly discussed the slightly different administrative arrangements with State Climatologists located at State Universities in separate offices, in integrated offices of the Weather Bureau and those where climatological functions are only a part-time duty at the present time. Also, he briefly outlined the plans for further changes in the State climatological program. These are contingent upon availability of funds and properly qualified personnel.

Dr. Barger then discussed the general climatological program in the North Central States. All of these now have a Weekly Weather and Crop Bulletin cooperatively produced by the Agricultural Marketing Service and the Weather Bureau. Twelve of the state universities or other state agencies have also entered into cooperative agreements with the Weather Bureau to produce punched card decks of long-record cooperative stations for the period prior to 1948 when the Weather Bureau started routine punching of substation observations. He presented a summary of the weather and climatological project carried out by the North Central Agricultural Experiment Stations, also known as Project, NC-26. Several of the state experiment stations in the North Central area now employ on their staffs meteorologists or climatologists to further the objectives of this project. Most of the state climatologists are also cooperating with physicians designated by the American Academy of Allergy to determine, if possible, meteorological causes for allergic complaints and diseases. In most of the states of the North Central region soil moisture sampling is going on with cooperation of the State Climatologists. Among special studies carried in these states, Dr. Barger mentioned the freeze and thaw study made at Brookings, South Dakota, and the cooperative drought studies in Kansas, Missouri, and Iowa. He also mentioned the Missouri Climatic Atlas produced by the University of Missouri under Dr. Decker and the micro-climatic studies of Professors Sugmi and Wang at the University of Wisconsin, now in the process of publication.

The studies on rainfall probabilities in the Great Plains and the need for a standard of an agricultural station were briefly touched upon. Also, the rain making efforts in South Dakota, Southwest Missouri and Iowa were mentioned. In this connection the discussion revealed a need for some objective articles on the artificial stimulation of precipitation. There is no source of reliable official statements available for the agriculturist. It was brought out that recent articles in the press and in popular magazines have been more confusing to farmers than enlightening.

Dr. Barger's presentation was followed by Mr. McGuire's report on the activities in the Northeast Area. Mr. McGuire discussed his visits to the various universities and Agricultural Experiment Stations and the effort to get a card punching program launched comparable to that in the North Central States. At present it appears at least twelve stations in New England, ten stations each in New York, New Jersey and six in West Virginia will be punched by local agencies. In Maryland and Delaware, with the cooperation of the University and State Weather Service, all long-record cooperative stations will gradually be placed on punched cards. During the next fiscal year part of this will be financed by Project NE-35 of the Northeastern Agricultural Experiment Stations. This project is entitled "Applied Climatology for Agricultural Projects," and present estimates foresee that

initially \$20,000 will be spent on production of punched cards and \$10,000 on micro-climatology. Mr. McGuire discussed the general industrial and commercial interest in climatology in the Northeast and in particular stressed the need of additional climatological information applicable to air conditioning for most of his states. He also pointed towards the need for preliminary releases of climatological data prior to publication.

Mr. Eichmeier reviewed the State Climatological Program in Michigan. The publication of five elaborate station summaries was based on the punched card program. He indicated the extent of the state cooperation through the Michigan Weather Service which contributes \$6,200 per annum from state funds to the climatological program. An interesting cooperative project on the micro-climatological scale is the study of two small drainage basins where 16 recording rain gages cover an area of only 25 square miles. Another micro-climatic station at Michigan State University was also expected to be in operation this autumn. He pointed out the use of climatic data for the preparation of the maple sap forecasts through the establishment of relations between sap running, maximum temperatures and sunshine. The first regular substation summary in the climatology series for Michigan is about to appear for the Battle Creek substation. Another cooperative project is carried on in Michigan with the Army Engineers Lake Level Survey. Storage gages are operated in Northern Lake Michigan and comparisons with land stations are being obtained. Present indications show considerably lower totals on the island stations compared to land. Occurrence of temperatures of 24, 28, and 32°F have been published for the cooperative stations on a probability basis.

For Ohio Mr. Pierce reported the initiation of a punched card program in April with the Ohio Agricultural Experiment Station. He outlined his cooperation with the Worcester Experiment Station and the Agricultural Research Station at Coshocton. He reviewed in some detail the use of the lysimeter records for an improvement in the Thornthwaite formula on evapotranspiration and the application of this information to the hay crop. He has also produced crop moisture deficit charts on the basis of his improved formula which seem to check, at least during the current year, quite well with observations made by county agents. Another micro-climatic program in Ohio is the planned installation of a weather station at the University farm in Columbus for comparisons with data gathered by the Weather Bureau at the airport and urban stations.

Mr. Joos reported on the cooperative arrangements with the State Water Survey in Illinois where his office is located. He mentioned that 33 stations have been punched and four substation summaries have been published by the Illinois State Water Survey cooperatively with the Weather Bureau. The first annual report on the cooperative punched card program just appeared and will be distributed to State Climatologists. One of the new developments is the sequence counting procedure for wet and dry days. He also mentioned the preparation of a tornado study for Illinois. He pointed out that Illinois has the unfortunate distinction of the maximum tornado deaths.

Mr. Elford of Iowa reported on the long-standing climatological interest in Iowa which even antedates the Signal Corps Weather Service. The State still contributes \$6,000 per annum for clerical help used in the State Climatologist's office and the use of state transportation for the State

Climatologist. A great many programs are carried on more or less routinely. Among them are the agricultural reports on corn moisture and corn phenology. A preliminary monthly report is issued also for Iowa. At 15 stations soil moisture is measured four times a year. Samples of various publications from his office were given to the Committee. Among them a dry and wet bulb frequency distribution and a pamphlet on the climate of Iowa which appeared as part of the annual Iowa Yearbook of Agriculture. Elaborate substation summaries have been prepared for Cedar Rapids and Pocahontas.

Mr. Schaal, although only recently installed as State Climatologist for Indiana at Lafayette, reported the excellent cooperation received from the University and particularly from Professor Newman. Punching for twenty substation records has been initiated and the statistical department of Purdue University will do some of the analyses. He pointed out the desirability of adding to the probabilities of freezing and subfreezing temperature values of 36 and 40°F which have agricultural significance. A study with the Indiana Gas and Electric Company on natural gas consumption will add to the degree day index wind and pyrheliometer information in order to make it more realistic for correlation with gas consumption. One of the items of specific interest in the Weekly Weather and Crop Bulletin for Indiana was the interpretation of the 30 day outlook of the Weather Bureau for farmers by Professor Newmann of the Purdue Agronomy Department. For example, in the June 5th release the bulletin had the following comment: "Farm Operation: with the below normal rainfall pattern foreseen in June several good hay making days should be forthcoming. Perhaps the making of dry hay should be practiced in the early part of the season this year rather than waiting until late July and August. In planning hay making operations it is advisable to check the daily and five-day forecasts first before beginning work. A five-day forecast is now available Monday morning." This particular interpretation found favorable attention among those present at the meeting as an intelligent use of available weather information. Mr. Schaal also mentioned his consultations on micro-meteorology and ecology of bacterial wilt with personnel of the State Agricultural Experiment Station. Substation summaries are about to appear for Lafayette and Valparaiso.

Mr. Kauffman of Pennsylvania pointed to the progress of the substation history program in his state which is now completed for all stations which will appear in the Bulletin W Supplement. The cooperative punched card program in Pennsylvania is depending on a special appropriation of the State Legislature of \$20,000; as yet still to be earmarked for this specific purpose by the Department of Forests and Water. If these funds become available 50 to 100 stations will be placed on punched cards. Close cooperation has been established with the Federal Pasture Laboratory and the Pennsylvania State University at University Park. A study on the temperature variations as indicated by stations on the campus and the university farms is now under way. Discussions on relations of weather to highway safety have been held with the Turnpike Commission particularly as related to precipitation and to fatigue factors in good and bad weather. Mr. Kauffman outlined the typical type of requests directed to State Climatologists as exemplified by inquiries received at his office during the month of May.

Interspersed with the presentations were discussions of the committee with the state and area climatologists. Among the more interesting were the general conclusion that the State weather and crop bulletins should be kept flexible and maintain their individual character. It seems to be undesirable to standardize either format or contents. It would also be desirable from time to time to pick out outstanding issues from one state and circulate them to others to serve as models.

Among general problems raised was the question of the desirability of preliminary monthly summaries of climatological data for which there is still a rather substantial number of requests. This question needs a complete evaluation and the possibility of returning to weekly or even daily reports by cooperative observers should be explored again. In some states the severe storm reporting clipping service still needs improvement. Another question requiring evaluation is the issuance of the Corn and Wheat Bulletin from Chicago.

It was also discussed that it might be desirable in the future to list when new division averages are established, instead of departures from normal, the departures from median for monthly or weekly precipitation or explore the publication of quintiles similar to the usage in "Climatic Data for the World."

It was brought out that it would be highly desirable to produce a bibliography of studies based on the punched card project, in the various states. Also, that guidance outlining the fundamentals of methodology in using punched cards for climatological purposes be given and publicize specific applications for the use of the punched cards when they become available. In this discussion Dr. Barger pointed out some of the studies that have already been prepared, such as the Minnesota study on water depletion of soil in relation to irrigation scheduling and the Iowa Freeze hazard study, the rainfall and corn yield project, and others.

Dr. Landsberg briefed the Committee on the plans for the state climatological program, especially the gradual expansion into states where as yet no full-time climatological positions exist. This is essentially a matter of availability of funds. He also indicated that for the current year authority has been granted to employ 5 or 6 student trainees in the offices of state climatologists. This has the double advantage of affording some help to the state climatologist and at the same time acquaint young people with the Weather Bureau and the current opportunities in climatology. It was pointed out by Dr. Baum that the announcement for the student trainee program was deficient inasmuch as it did not permit students who had a B. S. in another science to participate even though they are just beginners in meteorology. The Committee felt that in view of the current shortage of personnel a student trainee program would offer the best opportunities to recruit well qualified personnel for the future, especially if they find working conditions in the Weather Bureau attractive and the program challenging to their imagination.

The Committee was then briefed on the current status of research projects in climatology. First and foremost, the progress of the microfilming process for punched cards and the status of development of FOSDIC were discussed. Also, the plan for the 70-mm combined microfilming of punched

cards and documents from which the data had been derived for the purpose of developing a rapid selector-recall system for climatological data was presented. The progress of the Civil Defense Fallout Project, the Public Health potential air pollution index, the Navy Marine Atlas and its merchant marine "derivative"; the Hurricane statistics and the soil moisture, soil temperature study were briefly described.

The Committee and State Climatologists again evidenced considerable interest in the status of the bench-mark station program. It was pointed out that there is really a dearth of good long records and that the analysis of homogeneity for the station selection is proceeding slowly.

The cooperative research agreements with other institutions were then presented to the Committee. Among these are the drought index studies under way at Kansas State University, Missouri State University and Iowa State University. The contracts on phenology with the American Institute of Crop Ecology, on climatic comfort indices with the University of Washington, on representativeness of marine climatic data with the Florida State University, on historical climatic documents with the American Meteorological Society and the cooperative project with Meteorological Abstracts and Bibliography on reference cards and abstracts for climatological material of interest to state climatologists.

The plans for other research projects were discussed. In this discussion the desirability of further phenological observations for climatological purposes was brought out. It was the general consensus that in the next few years a further expansion in the field of bioclimatology would be highly desirable. This should encompass not only the agricultural phase but also the human health aspects. In this connection the joint studies with the American Academy of Allergy, the histoplasmosis problem of Public Health Service and the air pollution studies were stressed. Dr. Malone raised the question of the use of climatic data for forecasting and in the preparation of probability predictions. He briefly mentioned the work now going on at his research center and felt that some of the facilities now becoming available at Asheville should be geared to do further research in this direction.

The Committee then discussed date and place of its next meeting. This will be held in conjunction with the AMS meeting in Asheville, possibly followed at a later date by another meeting at one of the WRPC's. Subsequently the Committee held an executive session for the purpose of rendering a formal report to National Research Council.

The Area and State Climatologists met with Dr. Landsberg for some informal discussions on climatological service problems.

2. PROGRESS ON STATE CLIMATOLOGICAL DIVISIONS. (Reference our memorandum of March 12, 1956.) A number of State Climatologists have reviewed their climatological division boundaries, as suggested in the reference and sent their suggestions in for approval. Where this has been done, and long term means are available, division departures will be resumed in CD.

In our memorandum, however, we asked that a report on division boundaries be submitted by September 1, 1956. We would much appreciate an effort on the part of those State Climatologists who have not yet made a report, to do so at their earliest convenience. The reason for this urgency is that the WRPCs are in a much better position to compute the necessary long-term (1931-1955) means and departures during the summer than at any other time.

3. STATE AVERAGES. The following paragraphs are taken from a letter by Mr. Steves, Supervising Climatologist at the Chattanooga, Tennessee WRPC to a requester who had asked for state values. We consider this a good approach to this question.

"It has been thought for some time that the State averages which were published for so long were purely fictitious and had no actual basis in fact. It was difficult, if not altogether impossible, to find a single station that even approximated these values for both temperature and precipitation, and if the snowfall average were to be included finding such a station would indeed be out of the question. In writing weather summaries for the Climatological Data bulletins we have noticed repeatedly that State averages would be quite near normal yet almost completely masked would be periods of outstanding importance in one or more parts of the State. Perhaps a good way to put it would be to say that reliance on an array of State averages for any given month to determine the weather of that month over a period of years is a good bit like trying to assess the contents of a row of books by merely looking at the covers. Many - and oftentimes we must include ourselves in this group - become so accustomed to seeing things done a certain way over a long period of time that they not only fail to evaluate what is being done, but vigorously resist any effort to make hoped for improvements.

"We hope the foregoing comments will serve to dissuade you from using State averages of temperature, precipitation and snowfall. However, should you believe these averages have sufficient value to warrant their continued use, on the attached sheet you will find the method we have used for their computation."

4. FURTHER DEVELOPMENT ON COOPERATION WITH AMERICAN ACADEMY OF ALLERGY. (Reference items 3 and 4, CSM No. 52.) Dr. Harold S. Tuft, Chairman of the Academy Committee on Weather and Allergies, has distributed information to the various members of his committee clarifying their part in the proposed study in which an attempt will be made to relate weather phenomena to human discomfort. The clinicians listed in item 3, CSM No. 52, should now have this information and will therefore know more about the part they should play in this study, and how the State Climatologists may cooperate.

5. CLIMATOLOGICAL ASSISTANCE TO AGRICULTURE. Many individual farmers are often faced with the question of whether or not to invest in hail insurance on their wheat. In many sections it is so dry that they wonder whether the wheat will be worth risking the additional expense of hail insurance premiums. Often the tendency of the individual farmer is to wait for rain to improve his prospects before he buys the insurance.

It is possible to work out the climatological probabilities of various amounts of rainfall between now and harvest. In other words, climatology can provide some useful answers to the question: "What are the chances that it will rain enough between now and harvest to make: (a) a fair wheat crop, (b) a good wheat crop, (c) an excellent wheat crop?"

Inasmuch as relatively little work of a climatological nature has been done on subjects such as this in the past, the Office of Climatology would like to receive copies of studies of such climatological information which anyone in the field may be able to develop.

6. FORM OF SOIL MOISTURE DATA. In view of the increasing interest in and demand for publication of soil moisture measurements there are plans for publishing in the Weekly Weather and Crop Bulletin, National Summary, tables of available soil moisture measurements. In order that the information will be uniform for interpretations and comparisons the following six-column table has been proposed.

(Example)

SOIL MOISTURE, AMES, IOWA

Soil - Clarion Webster

Plot - Alta-Fescue Sod

Date - June 1, 1956

Method - Gravimetric

Depth of Layer (inches)	Field Capacity (a)	Wilting Point (b)	Available Capacity (c)=(a-b)	Total Moisture (d)	Available Moisture (d-b)*	
0 - 6	2.1	1.2	0.9	1.2	0.0	inches
6 - 12	2.0	1.0	1.0	1.1	0.1	
12 - 24	3.5	2.3	1.2	2.4	0.1	
24 - 36	2.8	1.5	1.3	2.0	0.5	
36 - 48	2.8	1.3	1.5	1.6	0.3	
48 - 60	2.7	1.2	1.5	1.6	0.4	
Total inches	15.9	8.5	7.4	9.9	1.4	

* Available moisture may exceed available capacity if gravitational water is present.

(Later on, as the number of such observations increases, this table may be replaced by two columns giving available moisture and deficiency from field capacity. This can be done after a preliminary trial period without serious loss of information.)

The depths and layers shown on this table are generally adequate for most purposes; however, it is not necessary to adhere strictly to them. In some areas the soil characteristics and cropping conditions will make it unnecessary to make measurements as deep as five feet. Please bring this matter to the attention of those agencies with whom you may now or will be cooperating in securing such data.

7. CASH AWARDS. Mr. Benjamin Ratner of the Dynamic Climatology Section, Office of Climatology has received a Superior Accomplishment Award of \$100 for his work in connection with climatological analysis of radioactive fall-out patterns.

Mr. Kenneth L. Hein of the Chattanooga WRPC has been given a Superior Accomplishment Award of \$50 for developing a successful technique for mechanically determining freeze data for inclusion in Climatological Data annual.

8. RESUME OF ARRANGEMENT OF REVISED CHAPTERS OF PART C, WEATHER BUREAU MANUAL, VOLUME III. In the revision of Part C, Weather Bureau Manual, Volume III, with many changes involved in arrangement and context, it was impossible to avoid some complications. The fact that some of the instructions contained therein, formerly the responsibility of the Office of Climatology but now to be prepared by the Observations and Station Facilities Division, and including some whole chapters and individual paragraphs, further complicated the situation. To clear up any difficulties you may have in maintaining proper arrangement of the various chapters of Part C we are furnishing below a complete and detailed resume of the structure of that part on climatology.

Chapter C-01. Functions and Organization for Climatological Operations. The old chapter, showing date of February 12, 1954, should be retained until a revision is completed by this office. The revision will also be Chapter C-01.

Chapter C-02. Climatological Networks. This old chapter, showing date of February 12, 1954, should be retained until a new chapter is issued. The new chapter on networks will be prepared by the Observations and Station Facilities Division and will not be a part of Part C.

Chapter C-02. Public Service - Climatological. This new chapter, dated December 12, 1955, replaces the old Chapter C-03, dated February 12, 1954. The old Chapter C-03 should be destroyed.

Chapter C-03. Weather Records Processing and the Punched Card Program. This new chapter, dated November 21, 1955, replaces the old Chapter C-05, dated May 7, 1954. The old Chapter C-05 should be destroyed.

Chapter C-04. Climatological Publications. This new chapter, dated January 30, 1956 replaces the old Chapter C-06, dated May 7, 1954. The old Chapter C-06 should be destroyed.

Chapter C-05. Instructions for Preparing Copy for Climatological Publications. This new chapter, dated April 27, 1956, replaces the old Chapter C-07, dated May 7, 1954. The old Chapter C-07 should be destroyed except for paragraphs C-0745 and C-0750. The contents of these two paragraphs will be included in a chapter to be prepared by Observations and Station Facilities Division and should be retained until revised instructions are issued to replace them. We suggest that the old paragraphs C-0745 and C-0750 be placed immediately following the new Chapter C-05, and a note attached to them to show why they are being retained.

Chapter C-08. Climatological Forms and Charts. This chapter, dated May 2, 1952, is still in effect generally. Its contents will be included in another chapter (not in Part C) and will be prepared by the Observations and Station Facilities Division. Chapter C-08 should be retained until its replacement is issued.

Chapter C-09. The "Climat" Program. This chapter, dated June 28, 1951, will be revised and brought up-to-date by this office. It will then be numbered Chapter C-06. It, too, should be retained until a revision is issued.

Of course, some of the original instructions in the old chapters still in effect (C-01, C-02, C-08, and C-09) have been amended from time-to-time by circular letters, memoranda, etc., but they are still, in general, the basic instructions.

9. BOUND VOLUMES OF CLIMATOLOGICAL DATA (STATE): We plan to bind the Climatological Data for each state (or section) in volumes to include all of the monthly and annual issues for the period January 1952 through the Annual 1956. As stated in our memorandum (file C-3:1) dated April 12, 1956, each State Climatologist will automatically receive the volume for his state as it becomes available.

The need for Climatological Data for neighboring states is recognized, but we believe that this need can be better satisfied by regular and current receipt of the separate monthly and annual issues. For keeping these separates more or less compact a ring binder could be used to hold whatever period of years is most convenient. Thus, when filing or bookcase space becomes limited, or the need for older issues lessens considerably, surplus separates can be returned to the NWRC.

Only where it can be shown that bound volumes are specifically justified in lieu of separates will they be furnished for other than the "home" state. It cost approximately four dollars to bind one of these volumes. Wholesale binding is not justifiable.

Offices requiring separates of CD's for states other than their own should arrange with the NWRC to be placed on the proper mailing lists. Where a good case for binding can be made send requests to the Office of Climatology.

10. COOLING DEGREE DAYS AND AIR CONDITIONING. There has been an obvious public surge of interest in air conditioning design, development and distribution. Each phase has its own problems, and we are attempting to determine the suitable methods of data presentation. One important factor is that temperature alone does not determine air conditioning need. Aside from the element of sensible variation to high temperatures amongst individuals, it has been found that humidity is nearly as important as temperature. For this reason hourly wet-bulb temperatures are being incorporated into the Monthly Local Climatological Data Supplement. One approximation of need for air conditioning is a new concept, the "discomfort index," which is the average of the simultaneous dry-bulb and wet-bulb temperature reading. The lower limit of this index which indicates need for air conditioning is yet to be finally determined but it seems likely that this limit, expressed as the mean of the 24-hourly readings for the day, will be not far from 60° while the hourly index value indicating the point at which air conditioning units will be turned on will probably be 70° or a little higher. Other approximations have been suggested, but this discomfort index concept lends itself to punched card techniques. The first published tabular example appears as Table No. 26 in the "Climatic Guide for Baltimore, Maryland" which you recently received.

In order to coordinate completely on this problem we would appreciate comments on findings of the area and state climatologists with respect to data requests, methods of analysis and use of data by interests in the respective states.

11. THE COOPERATIVE WEATHER OBSERVER. Central Office stocks of this publication, issued in 1951, are getting low. State Climatologists and others having a supply of this book will please report the number on hand.

12. USE OF THE TERMS "DIVISION" AND "DISTRICT". We suggest, for the sake of standardization, that climatological break-downs within a state be referred to as "divisions" rather than "districts".

13. FORM 612-13, ROUTING OF. It has been suggested by the State Climatologist in California that routing of Forms 612-13 be changed as follows:

1. River District Offices to mail original and carbon copy of Form 612-13 containing precipitation and/or temperature data to WRPC.
2. WRPC to forward carbon copy or photocopy of Form 612-13 to State Climatologist.

Under the present method, the River District Offices mail the original to WRPC, and the carbon copy to the State Climatologist. The proposed method would eliminate split mailing by River District Offices. The suggestor stated that it would also insure a complete file of Forms 612-13 at State Climatologists' Office without the necessity of keeping a separate checking system.

Before any change is made in the present system of routing Forms 612-13, the Hydrologic Services Division would like to have comments from all field offices concerned as to the effect of the proposed plan on any special field programs and whether the change would be helpful.

Replies should be made directly to Hydrologic Services Division by August 1, 1956.

14. ACTIVITIES OF STATE CLIMATOLOGISTS. The following is taken from a recent report of the State Climatologist, California:

"Some of the more interesting recent requests:

- a. U. S. Food and Drug uses current temperature information compiled for crop bulletin as guide for planning trips in inspecting vegetable crops. For example, freeze damage to celery is sometimes hard to detect by casual observation but celery will deteriorate in shipment - therefore after reported freezing temperatures in celery areas (predominantly Salinas Valley) special inspection trip is made to examine carefully for frost damage. Similarly, precipitation reports are important in timing inspection trips to tomato farms since cold damp weather causes mold, and about one week after rains the inspector visits areas to see if mold is breaking out. If weather is immediately warm and dry following rain there is little mold and no inspection trip is necessary.
- b. In addition to use of relative humidity for cooling calculations we have had several requests for maximum relative humidity and temperature conditions from organizations preparing to purchase electronic equipment which cannot be used with relative humidities and temperatures above certain limits, the last visitors being representatives of the Southern Pacific Railroad who were planning to buy equipment which could not be used above a relative humidity of 80% or a temperature of 90 degrees.
- c. International Mineral and Chemical Company (maker of "Accent") is interested in climatic regimes of various areas to correlate with mono-sodium glutemate content of sugar beets which varies inversely with sugar content and shows wide fluctuations over areas and in different years.
- d. Standard Oil Company bases "anti-vapor lock gasoline" formula on "practical maximum temperatures" in area where gasoline will be used.

15. REMINDER. In items #8, 11, and 13, of CSM #53, we asked for reports on Forms 1066, climatological books, and telephone numbers, respectively. If you have not already done so, please let us have this information.

H. E. Landsberg
H. E. Landsberg
Director, Office of Climatology

GUIDE TO CLIMATOLOGICAL SERVICES MEMORANDUM NO. 54

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