

UNITED STATES DEPARTMENT OF COMMERCE  
WEATHER BUREAU  
WASHINGTON

April 10, 1961

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

C-3.1

FILE: 922 MEMO

(Climatological Services Memorandum No. 85)

WASHINGTON, D.C.  
4-10-61

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 : Director, Climatology

SUBJECT : Climatological Services Memorandum No. 85

1. MINUTES OF 11th MEETING OF ADVISORY COMMITTEE ON CLIMATOLOGY, MARCH 6 AND 7, 1961: The Committee met at the National Weather Records Center, Asheville, N. C. All members of the Committee (Dr. Longwell, chairman, Dr. Hewson, Dr. Reifsnyder, Dr. Benton, Dr. Miller) were present. Dr. Linn Hoover, Secretary of the Earth Sciences Division of the National Research Council also attended the sessions. The Office of Climatology was represented by Dr. Landsberg.

An informal report on progress of the Office of Climatology during the past year was rendered. Some of this is reflected in various publications which appeared in the interval. Among them are "Climatology at Work" and the "Cooperative Weather Observer". An important landmark in international cooperation was established at the CCI III meeting in London in December 1960. The results of this meeting will affect several of the operating programs of the Weather Bureau in Climatology (See report of this meeting in CSM 84). Changes in personnel at the National Weather Records Center and future staffing plans were briefly discussed. The systematic attempts to qualify climatological personnel better through academic and administrative courses was stressed.

The Committee was informed of the current status of funding for climatological work and the budget request pending before Congress for the next fiscal year.

The grave difficulties encountered for climatological work by the instability of the Weather Bureau Station Network was briefly discussed. The problem of maintenance of certain stations primarily for stability of climatic records was laid before the Committee. Is the pattern at Blue Hill Observatory and perhaps Central Park Observatory to become a prototype? The present status of analysis of the benchmark stations and the gradual expansion of this observing program with more sophisticated equipment was briefly touched upon.

Dr. Crutcher, Acting Director of NWRC, informed the Committee on current activities. The transition to the Minneapolis-Honeywell Computer will be completed by about the middle of April 1961. Specialized Navy work will

culminate with the completion of the Marine Climatological Atlas. The final volumes on the Arctic and Antarctic Seas are scheduled for completion in 1962 and 1963, respectively. The Committee then inspected the two volumes of Upper Wind Statistics Charts for the Northern Hemisphere prepared by Dr. Crutcher. The Committee expressed its great interest in this fine production. It certainly contains the basis for further important contributions in dynamic climatology. (These were further discussed under the future research plans). Other prospective jobs include refractive indices for the Sandia Corporation; a task for the Department of Agriculture on leaf, bark, and root temperatures; a snow load study for the proposed microwave network of the Bell Telephone Company.

Mr. McMurray gave a briefing on the IGY pole-to-pole cross sections, which are being prepared for each day of the IGY period along the 80°W. meridian. In the southern hemisphere this line can only be roughly approximated by available data. Completion of the manuscript sections in several months is envisaged. As a by-product of these mean monthly cross sections are being prepared. The first few months have been completed and have been compared to various available long-term means. Rather interesting anomaly charts and sections on the position of the maximum zonal winds have been drawn for part of the period. This set will be completed as soon as the individual analyses permit.

Mr. Joiner brought the Committee up-to-date on FOSDIC operations. A total of 54 million cards have been reduced to film. This is not much over 1 1/3 year of current card accession. The space problem will remain acute until the second filmer, scheduled for delivery during 1961, is brought into operation. The FOSDIC reader has proved itself in the checking of the film and on several recall jobs. The second model will be considerably more sophisticated and will be capable through suitable buffer stages to convert data from the film directly to computer input media other than cards.

The progress on the Decennial Census of Climate was reported by Mr. Canfield. He pointed out that the item of first priority is new station normals for the period 1931-1960. The problem is quite complicated because in this interval of 295 stations only 21 had no change in thermometer shelter. Adjustment of the normals to the latest exposure has been vastly complicated by the installation of 83 hygrothermometers in the past year. In discussion of this program the Committee was quite concerned about the impact of these changes on the climatological program. The group talked about the plans for placing the old (index) normals 1921-50 in juxtaposition to the new (standard) normals 1931-60. Several members of the Committee voiced doubts whether one could properly test the significance of differences and counseled that the publication of these data simply list the values and indicate the procedure by which they were obtained, avoiding if possible the term "significance" because of the possible ambiguous interpretation.

It was indicated that the amount secured for the decennial census (\$35,000) would not suffice to complete the normals project this fiscal year because of the complications. The prospect of including normals for several thousand substations to be done at the WRPCs was welcomed. The Committee suggested that those substations which had remained in the same location in the whole

30 year period be properly identified in the publication.

Considerable time was spent in discussing the statement on research and development plans distributed with the agenda. The Committee members voiced the opinion that this should be looked upon only as a first step, especially as regards the funding. An order of magnitude increase should be envisaged. In particular, several members felt that the time was ripe to exploit the material that served as basis for Dr. Crutcher's wind atlas for derivation of dynamic properties of the atmosphere. Among them are eddy stress terms, momentum balance, energy balance, moisture transport, etc. The suggestion was made to develop procedures to calculate these derived terms from the upper air data so that this could be eventually included in the routine procedures of upper air data processing at NWRC. This could then serve as climatological background material for other studies in dynamic meteorology. The Chairman invited Committee members to send him individual comments on the research program. He will consolidate these into a recommendation to the Chief of Bureau.

The report on bioclimatic work in Europe was briefly discussed. The point was made that in the field of human bioclimatology the basic problem lies primarily in fields other than meteorology. However, the role of meteorologist as a consultant was stressed. In order to qualify Weather Bureau personnel in this respect the possibility of sending some well-qualified members of the staff to the contemplated graduate training program of the Central University group was mentioned. Dr. Hewson indicated that plans for this are sufficiently well advanced to begin, in a modest way, next September.

The increase in confusion engendered by the Lally-Watson Article in the December 1960 Weatherwise article on Humiture was noted. The Committee felt that this term and its new definition should be avoided by the Weather Bureau and will make a formal statement to this effect to the Chief of Bureau. They agreed with Dr. Sargent's letter of January 20, 1961 to the Editor of Weatherwise. In view of the physiological uncertainties in the various indices, the Committee thought it might be advisable to gradually accustom the public to the use of the dew point temperature as an indicator of atmospheric moisture content and the implications of the temperature dew point spread.

The establishment of the new oceanographic data center and its relation to NWRC was briefly discussed. The interest of the Weather Bureau in this new establishment was stressed and the Weather Bureau representation on the directing board was indicated. The Committee expressed the hope that the new center would not duplicate work of or compete with other data centers and also that full advantage be taken of the experience and know-how of NWRC in its operation.

The possibility of changing the Northern Hemisphere daily data tabulation into a world-wide publication under WMO sponsorship was laid before the Group. The possibility of obtaining checked data from foreign nations would seem to be one of the major advantages for the meteorological data archive and for research meteorologists. The Committee favored the idea. Dr. Benton felt that it might be desirable to ascertain the actual use of this data source by research workers in this country and abroad.

Dr. Hoover acquainted the Committee with several pending problems before the Earth Sciences Division of NRC. The various committees might be asked to contribute to these. Among them is a survey on the status of research for the Federal Council for Science and Technology and recommendations from the National Academy - National Research Council on research to further the Administration's broad programs. He also briefed the Committee on the status of the Indian Ocean oceanographic study and the meteorological program that was finally appended to it.

The Committee discussed informally plans for future meetings. One might perhaps be held at the West Coast when the IUGG assembles there. The possibility of a meeting in conjunction with an AMS conference on Applied Meteorology at NWRC some future year, might also be envisaged.

2. FROST DEPTH DATA: Re CSM #57, Item 5. State Climatologists are asked to report to us the frost depth data on file in their offices. The report should include name of station and approximate period of record.

3. MOISTENING SPONGES FOR FILMAC READER-PRINTER: Mr. Andrew D. Robb, State Climatologist for Kansas, has suggested that offices that have infrequent use for their Filmac 100 Microfilm Reader-Printer could keep their sponges moist in a simple manner. He uses a narrow-mouth pickle jar with a tight fitting lid, and stores the sponge in it with a small amount of activator fluid. The sponge is then inserted in the tray when needed, and is ready for action. This is a good suggestion, provided that care is taken to prevent the activator solution from dripping on clothing. The solution weakens fabric, and causes holes to appear in the cleaning or laundering processes.

4. GOVERNMENT CAREERS IN METEOROLOGY: The following is a talk given by Dr. Landsberg to the Connecticut Chapter of the American Meteorological Society at a recent meeting. It was primarily for the guidance of teachers in secondary schools.

"Two-thirds of all meteorologists in the country work for the federal Government. Many among the remaining third have contracts from the government. That makes Uncle Sam the largest employer and sponsor of meteorologists in the world. There is every reason to believe that this will remain so in the foreseeable future.

"It is, therefore, only appropriate that we should take a look at the federal career chances in this field. The general terms of the jobs, both civilian and military, are, of course, the same as in other branches of the public service. But let me assure you at the outset that the meteorological jobs are neither humdrum nor stifling. You - on the outside - often get that picture of a boring bureaucracy the minute government is mentioned. But let me assure you that this work is, in fact, quite different from its popular image.

"President Kennedy, in his State-of-the-Union message on January 30 of this year, said:

'Let the public service be a proud and lively career. And let every man and woman who works in any area, at any level, be able

to say with pride and honor in future years: "I served the United States Government in that hour of our nation's need."

"There is no doubt that the needs of the nation in meteorology will continue to grow. Nor is there any doubt that there are vastly expanding horizons for work in our field. This applies both to research and to practical use of the new knowledge in the day to day activities. We welcome new help, new ideas, and new views for our effort which has had a long and honorable history.

"Since the early days of the Republic the federal government has been engaged in meteorological studies and explorations. Our third President, Thomas Jefferson, probably stimulated much of the early work. We know that he faithfully took daily notes on the weather himself. We also know that he instructed Lewis and Clark to keep weather records on their famous expedition to explore the West. Our forebears well appreciated the weather influence on land development and they were concerned with the effects of weather on health. Since 1814 the federal government has been officially engaged in meteorological work. In these early days the Army Medical Department, the General Land Office, and the Patent Office were busy in this field. A little later the Navy and the Smithsonian Institution were added to the list. Over ninety years ago the Signal Corps was charged with the task of forecasting the weather and, finally, in 1890 much of the work became centered in the civilian Weather Bureau.

"In weather problems the responsibility of the federal government is uniquely involved. Weather is truly interstate in its movements and its effects. Hardly any other natural force has as much influence on the general welfare, which the Constitution is pledged to foster. Thus you will find that most federal departments and agencies have an interest in meteorology. I could throw nearly the whole federal alphabet at you because a recent count showed that there were at least 15 bureaus and agencies that employ meteorologists. The largest groups are with the military services, both in uniform and as civilians, and with the Weather Bureau. Their work covers so many activities that it would consume all evening to tell. Most of them are engaged in observing, forecasting, and research.

"This may sound a bit prosaic to you. But is it really? The fact is that many meteorologists lead an exciting and adventurous life. American meteorologists have posts from pole to pole. You find them on duty on high mountain tops, on the high seas, on far-away Pacific islands. Some serve in foreign lands, helping to set up weather services and training local personnel in the latest advances in our science. Although these far-flung opportunities exist, most of the meteorologists are located in the large and small cities in every state of the Union. There they work around the clock for the well-being and safety of their fellow citizens. They trace and predict storms, and the associated weather as it travels by, in unending sequence. It is less spectacular--and certainly much less publicized--work than that of our friends in the FBI, but none the less these weather men keep also track of vicious 'criminals', small and large--from twisters to hurricanes. About ten of the heavy tropical storms occur in oceans around us each year. They are our ten most wanted criminals. Our advance guards, the intrepid hurricane hunters

find them out at sea. Then the radar pickets swing into action to plot their course. The computer whirs madly to analyze their fingerprints and the forecasters warn their fellow citizens of their fury. It's as dramatic and as well-organized a hunt of a vicious disregarder of human life and property as you can find. Nowadays the effort is usually crowned by success and many lives are saved. On a smaller scale, the same protective organization functions for floods, snowstorms, and tornadoes. Meteorological networks span the far-flung reaches of the airways and act as weather guards for all flights. Safety, convenience and speed of flying depend on weather.

"But, as you all know, meteorology is not a completely exact science as yet. A vast research effort, over 90 per cent financed by the federal government, is penetrating the remaining secrets of the atmosphere. Much of this research is done in federal laboratories. These are well equipped and geared to do the most advanced work. Research in this field covers a very wide frontier. A few examples of the problems will have to suffice as illustration. At one end are the new scouting systems in the weather satellites which permit us to get a unique picture of global cloud patterns. They also will tell us more about the heat income of the earth from the sun and the radiative loss of heat from the earth. For the first time we will soon know these two basic elements which are fundamental to the understanding of the atmospheric flow. We have also never given up the hunt for new clues in making longer-range forecasts. Perhaps the answer is still inscribed in undeciphered language on the face of the sun. Our quest for knowledge also includes those subtle long-range changes which lead to long-term climatic fluctuations. Perhaps we can lift more veils from the mysteries of ice ages.

"Much of this knowledge, once acquired can be put to practical use in leading us to better use of our land resources. These problems in an era of population explosion are nation-wide and world-wide. They are of greatest concern for long-range government policies.

"Many of the projects carried out in government laboratories or in the universities under government sponsorship deal with studies of the water cycle from sea-to vapor-to cloud-to raindrop and snowflake-and rain. And back again through the run-off of precious water supplies to the sea. Are there possibilities to interfere artificially with this cycle? We soon hope to have unequivocal answers to this question.

"In all these efforts the finest of measuring devices are needed. Much electronic gear is at hand but the end is not in sight. Similarly, the large-scale electronic computer has been engaged in tying observations together into a coherent net. Causes and effects are being unravelled and with mathematical tools today's events are projected into the future. At present it is still an uncertain future. The observations are incomplete, the chain of sequences has missing links, the mathematical puzzles are only partially solved.

"Isn't it natural then that we are looking for help? We need new talent for the many riddles. We need men and women who can build evermore complicated equipment--and keep it going. We need mathematical and physical talent to help us in putting together the great atmospheric jig-saw puzzle. Above all

we need devoted meteorologists who are enthused by the rays of the sun, the chase of the clouds, the song of the winds. We need devoted new young scientists who are willing to serve their fellow-men.

"We hope you see the challenge of the tasks. We hope you will use your good influence to steer some of your students toward the satisfying careers that await them in meteorological science."

5. METEOROLOGICAL SATELLITE DATA: The first 7 100-ft. reels of TIROS-I cloud pictures have been transferred to the NWRC for archiving and servicing requests for copies. It now appears that there will be approximately 55 reels of TIROS-I cloud picture data.

6. PUBLICATIONS DISTRIBUTED TO STATE AND AREA CLIMATOLOGISTS SINCE CSM #84:

Atmospheric Influences on Crops (Iowa's Agricultural Weather), Iowa State University.

A Primer on Water, U. S. Geological Survey, Leopold and Langbein.

Distribution of Precipitation in South Carolina - Climatic Series No. 6, Clemson Agricultural College and U. S. Weather Bureau.

The Phyto-Climate of Wisconsin, 3. Moisture Normals and Hazards, Jen Yu Wang.

An Annotated Meteorological Bibliography for Secondary Schools, George H. Siehl, U. S. Weather Bureau.

*R. W. Schlemmer*  
for H. E. Landsberg  
Director, Climatology

GUIDE TO CLIMATOLOGICAL SERVICES  
MEMORANDUM NO. 85

<u>Item</u>		<u>Page</u>
1	MINUTES OF 11th MEETING OF ADVISORY COMMITTEE ON CLIMATOLOGY, MARCH 6 AND 7, 1961 . . . . .	1
2	FROST DEPTH DATA . . . . .	4
3	MOISTENING SPONGES FOR FILMAC READER-PRINTER . . . . .	4
4	GOVERNMENT CAREERS IN METEOROLOGY . . . . .	4
5	METEOROLOGICAL SATELLITE DATA . . . . .	7
6	PUBLICATIONS DISTRIBUTED TO STATE AND AREA CLIMATOLOGISTS SINCE CSM # 84 . . . . .	7