

REPORT OF THE CHIEF OF THE WEATHER BUREAU
UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

Washington, D. C.,

September 5, 1928.

Released afternoon
November 30, 1928

The Honorable W. M. Jardine,
Secretary of Agriculture.

Dear Mr. Secretary:

I have the honor to submit herewith the annual report of the Chief of the Weather Bureau for the year ended June 30, 1928.

Respectfully,

C. A. Marvin
Chief of Bureau.

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Two topics will be selected from the major activities of the bureau during the year ended June 30, 1928, for brief discussion in the abridged form of administrative report now in vogue, namely, (1) meteorology in aid of aviation, and (2) marine meteorology.

Meteorology in aid of Aviation.

Reference was made in the annual report for 1926 to the passage of the air commerce act, and we are now entering upon the third year of operations under the provisions of this act. It seems important to make of record the specific authority and

National Oceanic and Atmospheric Administration Report of the Chief of the Weather Bureau

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provisions in this act governing meteorological work for aeronautics. Section 5 (e) makes an important amendment of the organic act of the Weather Bureau, and reads as follows:

(e) Section 3 of the Act entitled "An Act to increase the efficiency and reduce the expense of the Signal Corps of the Army, and to transfer the Weather Service to the Department of Agriculture," approved October 1, 1890, is amended by adding at the end thereof a new paragraph to read as follows:

"Within the limits of the appropriations which may be made for such purpose, it shall be the duty of the Chief of the Weather Bureau, under the direction of the Secretary of Agriculture, (a) to furnish such weather reports, forecasts, warnings, and advices as may be required to promote the safety and efficiency of air navigation in the United States and above the high seas, particularly upon civil airways designated by the Secretary of Commerce under authority of law as routes suitable for air commerce, and (b) for such purposes to observe, measure, and investigate atmospheric phenomena, and establish meteorological offices and stations."

The foregoing is the specific authority under which the Weather Bureau of the Department of Agriculture conducts all its activities in aid of aeronautics. However, in order that these activities may be thoroughly coordinated with the responsibilities and duties imposed upon the Department of Commerce in the same act, mention is made of an important portion of section 2 of said act, which reads as follows:

Sec. 2. PROMOTION OF AIR COMMERCE.-- It shall be the duty of the Secretary of Commerce to foster air commerce in accordance with the provisions of this Act, and for such purpose--

(a) * * * * *
(b) To make recommendations to the Secretary of Agriculture as to necessary meteorological service.
* * * * *

Funds enabling the Weather Bureau to function under these added responsibilities were first made available in deficiency appropriations, for 1926, and annually thereafter in regular appropri-

ations of the Department of Agriculture, always, however, based on specific recommendations by the Secretary of Commerce as to the amount of work necessary to meet the prospective establishment of airways and aeronautical work planned by the Department of Commerce. It is pleasing to state that the most friendly cooperation has characterized the joint operations of the representatives of the two departments engaged in performing their respective duties.

On the part of the Weather Bureau, the ultimate objective sought to be attained in every case, in connection with airways established by the Department of Commerce, is to assign and maintain on duty at every important airport one or more skilled meteorologists, whose duties require them to receive from the central organization of the Weather Bureau the fullest possible advices, reports, observations, etc., including forecasts and warnings, and to pass these on to pilots of airplanes at the time of, and in accordance with, the flight immediately in contemplation. In the performance of these duties by the Weather Bureau, hearty cooperation is necessary, not only on the part of pilots but of officials of the transport companies, also representatives of the municipalities and of the airports themselves, in order that housing facilities and accommodations may be provided for the meteorologists, to enable them to properly and efficiently perform their duties. Naturally, in the beginning facilities and accommodations of this character were sometimes

wholly wanting, or inadequate and uninviting, leading to discontent and dissatisfaction on the part of earnest-minded meteorologists. However, this condition is rapidly disappearing and provisions are now generally made that entirely facilitate the work of the Weather Bureau in this line.

The basis of advices and warnings to pilots is necessarily derived from the great network of meteorological stations that has been built up by the Weather Bureau throughout past years. In some cases these stations are rather widely distributed. Moreover, observations are made regularly only at 8 a.m. and 8 p. m. For the needs of aeronautics, more intensive and special stations are required, especially in certain regions. To make provisions for this, the policy of the Weather Bureau has been to establish what are called "ground stations" at frequent intervals all along the airway. These ground stations are very often supplementary landing fields, and are frequently manned by employees of the transport companies or others, whose meteorological duties are to report present weather conditions, including ceiling, visibility, etc., as far as practicable, either at fixed intervals between regular observations or whenever called for by the meteorologist at the main airport. This supplementary service, to be effective, requires immediately available channels of communication all along the airways, the maintenance of such channels of communication being in general the function of the Department of Commerce rather than of the Weather Bureau. In the absence of leased wires or other equally effective com-

munication along airways, it has sometimes been necessary to use commercial systems, which involve certain delays. However, with the development of airways and the perfection of the whole machinery of operation, the meteorological service is becoming more and more effective.

The expanse of the territory covered by airways in the continental area of the magnitude of the United States can hardly be realized by those not immediately responsible for the organization and establishment of the service, obviously at very considerable expense. Here, again, it is a pleasure to mention the very cordial cooperation that has been maintained with municipalities and organizations interested in aeronautics. During the past year, especially, one of the transport companies operating over California, undertook itself to organize certain intensive meteorological operations according to ideas of its own. In the course of time, however, this activity became absorbed in the general program of conduct of the Weather Bureau work in this field. The time is near at hand, however, as aviation becomes more extensive and traffic more congested when it will become necessary to supplement the two daily observations, at 12-hour intervals, by intermediate observations midway between. In fact, there is a growing demand for four observations from meteorological stations over the entire globe, instead of two as generally taken heretofore. The hours for these observations are quite likely to be advanced in the near future in the United States so as to occur at 1 and 7 a.m. and

1 and 7 p.m., instead of at 8 a.m. and 8 p.m. as in the past. Aerial navigation is chiefly the cause of this, but more frequent observations are of great value for many other purposes as well.

To meet modern demands in meteorology, it became necessary a few years ago to undertake the entire reorganization of the scheme for collecting, by telegraph, the meteorological reports from field stations. Passing over the extreme magnitude of an undertaking of this kind, and the difficulties involved, it is gratifying to report that a new and more flexible system is now in operation, which greatly facilitates the collecting of observations and placing them more promptly than heretofore in the hands of those entitled to use them. The new system, moreover, permits of the shifting of the hours of observations, as mentioned in the foregoing, which was not possible under the old method of collection.

These reorganizations of the work of the bureau have contributed very greatly to the better adjustment of the whole program of activities to the growing demands of the public, and of air navigation especially, and we confidently look forward to the rendering of an increasing amount of service of a highly efficient character.

Marine Meteorology

Progress in meteorology during recent years has been urged onward chiefly in order to meet the demands by aviation and the navigation of the air. In no other field has this been so

difficult and pressing as that of transoceanic air navigation. The dream of the meteorologists for many years has been the collection of systematic synoptic observations from ocean areas as well as from the elaborate network of continental stations each important nation has been able to set up. In past years, these synoptic observations by means of ship reports have been available only after, in some cases, many months, when the mail reports could reach their destination. The only use which it has been possible to make of such observations is to chart them with continental observations and prepare daily weather maps, possibly a year or more after the observations have been made. Now, however, to meet the needs of transoceanic navigation of the air, we must have observations immediately available by radio and otherwise. Such a service as yet only very imperfectly organized, but is the pressing need of meteorology at the present day. Plans are already far advanced for the making of long ocean flights by one or more huge airships, and in preliminary understandings the great maritime nations of the globe are agreed that the time is ripe for each nation to organize ocean meteorological observations by the selection of a certain number of ships of its own registry which shall uniformly make radio observations, at least twice a day, possibly four times daily, while on the high seas. Arrangements also provide for the collection of these ship reports at those coast stations best adapted to receive them, and to promptly interchange such observations, internationally, in con-

nection with observations at continental stations, thus placing at the disposal of all participating nations the complete network of simultaneous reports needed in the preparation of weather charts twice, or four times, daily.

Coincidental with the foregoing, especially in the United States, is the necessity of compiling and analyzing numerous observations received in the past by mail from ships at sea, in order that normal conditions shall be gradually established, and especially that conditions in remote regions from which few reports are received shall be brought up to date and the information made available to navigators, not only of the oceans but of the air. The necessity for the extension of the daily program of meteorological work to oceanic areas is more obvious when we consider that continental stations in the aggregate cover and represent approximately only one-fourth of the earth's surface, the remaining three-fourths being oceanic areas.

The highest efficiency and accuracy in formulating weather forecasts and warnings is only attainable when the meteorologist has before him a complete picture of the weather conditions over the whole surface of the globe, or at least over the whole surface of the Northern or the Southern Hemisphere.

Up to the present time the meteorologist has been limited in his knowledge of atmospheric conditions simply to the continental areas, and often only to a single continent.

The development of an international meteorological oceanic service along these lines is perhaps the most urgent technical problem concerning meteorology at the present time.