

Technical Attachment

The First Texas Tornado Warning Conference

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The first Texas Tornado Warning Conference was held on 24 June 1953 at Texas A & M College, but it had its real beginning four minutes before the tornado struck downtown Waco, Texas, on May 11. A student assistant in the department of oceanography was operating the modified SN 7 10 cm radar set in the Electrical Engineering Building as part of a research project to investigate the application of radar information to synoptic weather analysis. Neither he nor any of the other meteorologists on the staff of the department was aware on that afternoon in May that a "black area" alert had been posted to give extra significance to the isolated echo that he picked up at 3:00. At 16:32 Central Standard Time, four minutes before the tornado struck downtown Waco, he took a routine photograph of the PPI scope which by this time displayed five large echoes. A comma-shaped echo on the 80 mile marker attracted no particular attention. When the evening newscasts began to carry word that a tornado had struck Waco, the personnel of the project began an all night vigil at the radar set.

By the next day it was clear that, with a reasonable amount of coordination between existing weather agencies, the means for preventing a large portion of the loss of life in the Waco disaster was at hand but had gone unused. If the meteorologists at Texas A & M had been aware that a black area alert was in effect, and if a warning plan had been made, the existence of the large echoes on the radar scope would have offered a basis for notifying communities in the vicinity of the echoes of the impending danger. This hind-sight examination of these events in May led to consideration of a storm warning plan which would coordinate existing services into an effective system for anticipating tornado strikes. The first approach considered was a letter to the governor, in which the existing facilities would be outlined and an offer made to assist the governor's representatives in establishing a radar warning system. This letter was drafted and was working its way through the channels of the college system when Captain H. T. Orville's boundless enthusiasm caught up with it. At his suggestion a conference to bring together interested agencies was conceived, planned and conducted in near-record time.

* This summary was the introductory paper in the *Proceedings of the Conference on Radio Meteorology*, held at the University of Texas, Austin, November 9-12, 1953. It is reproduced here essentially verbatim, with only minor punctuation changes, to commemorate the 50th anniversary of this historic gathering. Editorial comments, where noted, are in italics.

Invitations to take part in the conference were issued to all agencies and persons with an interest in the problem of "severe weather warning." Among these were: the U. S. Weather Bureau, Headquarters Air Weather Service of the Air Force, the U. S. Navy, Dow Chemical Company, Copano Research Institute, Central Power and Light Company, Oklahoma A & M, University of Texas, The Severe Storm Warning Center of the Air Force, Headquarters 16th Weather Squadron, Headquarters 24th Weather Squadron, Naval Air Station at Corpus Christi, the Texas Department of Public Safety, and The Texas Civil Defense Officer, as well as the departments of oceanography and electrical engineering at Texas A & M. In addition Mr. Jeff Davis, a newspaper publisher of Crockett, Texas, and Captain Orville, of Bendix Aviation Corporation, were invited as speakers.

Considering that less than a week elapsed between issuance of the invitations and the holding of the conference, it is remarkable that only four of the eighteen agencies invited were unable to attend.

The primary purpose of the conference was to examine existing facilities to determine whether coordination could weld them into an effective warning service. The agenda for the conference listed the following subjects for discussion:

- 1) existing tornado warning facilities,
- 2) observations of tornadoes and tornado situations,
- 3) survey of existing communication and radar facilities,
- 4) optimum utilization of existing facilities,
- 5) proposed warning systems, proposed research, and
- 6) the appointment of a working committee.

Following a brief address of welcome by Dean David H. Morgan, the conference was addressed by Captain Orville who traced the history of the Navy's participation in hurricane warning networks. Mr. Robert Simpson, Mr. E. L. Hardy [*USWB Region 2 - later renamed Southern Region - Director*] and Mr. L. F. Jones outlined the Weather Bureau's role in tornado warning. Mr. Joe S. Fletcher of the Department of Public Safety described the activities of that department during the San Angelo and Waco tornadoes [*which had occurred on May 11 that year*]; and Dr. J. C. Freeman, Jr. reviewed existing radar facilities. Each agency present at the conference was given an opportunity to describe what facilities and what procedures it had available for contribution to a general comprehensive warning system.

In the discussion attending these addresses it was brought out that an immediate improvement in warning efficiency could be gained by improvement of communications between the Weather Bureau and the Department of Public Safety. During the conference, representatives of these agencies reached an agreement to install a direct telephone line between the [*Austin*] Department of Public Safety offices and the [*Austin*] Weather Bureau Office, which would prevent the reoccurrence of a situation wherein the Department of Public Safety was unable to learn the exact nature of the storm threat. A second development which took place during the conference was the disclosure by Mr. Simpson, representative of the Washington office of the U. S. Weather Bureau, that the Weather Bureau had in its possession approximately 100 APS-2 radar sets which were to be converted for

storm protection purposes, but that the Weather Bureau was unable to make the modifications at a rapid rate. The suggestion was made that, if individual cities could support the conversion, it would be possible to place a modified radar set in each First Order Weather Bureau station throughout the state. This would result in a radar network capable of completely covering the state of Texas.

Considerable discussion arose concerning the question of when and how to warn the public about tornado danger. The need for avoidance of panic, the danger of crying “wolf” too often, and methods of educating the public to take intelligent action were discussed.

The conference closed with the appointment of a working committee whose function it is to implement the recommendations of the conference. This committee was composed of: Dr. John C. Freeman, of the Department of Oceanography, as chairman; Lt. Col. A. Payton, 16th Weather Squadron, Conley AFB, Waco, Texas; Mr. Jeff Davis, Editor and owner of the *Crockett Democrat*, Crockett, Texas; Mr. E. L. Hardy, Regional Director, Region 2 of the U. S. Weather Bureau, Fort Worth, Texas; and Mr. Joe S. Fletcher, Assistant Director, Texas Department of Public Safety, Austin, Texas.

This committee has met twice since the conference. At its first meeting in Waco on 9 July 1953, the committee discussed the problems of communications between the Department of Public Safety and the Weather Bureau, the operation of radar sets in the proposed Weather Bureau network, the problem of educating the public to intelligent action on the issuance of a tornado alert and a method by which the facilities of the Department of Public Safety could be enlisted to examine the actual storminess associated with an intense echo. The second meeting of the committee was held at Fort Worth, Texas, on 20 August 1953. At this time it was disclosed that arrangements for improved communications between the Department of Public Safety and the Weather Bureau had progressed to the point that a direct line had been installed between the Austin Weather Bureau Station and the Austin Office of the Department of Public Safety. In addition, each First Order Weather Bureau station in Texas had be furnished with the address of the appropriate Department of Public Safety Official to contact in the event of severe weather.

The mechanics of dispatching highway patrol cars to investigate intense echoes were further discussed; and a procedure was set up outlining a future meeting, at which the plan would be further worked out between Weather Bureau officials and Safety Department captains. The problem of educating the public to proper action on receipt of a tornado alert was discussed at length. It was decided that Mr. Davis, of the committee, would undertake a program of writing for public education purposes as chairman of a sub-committee. An article on the subject is being written for publication the *The Saturday Evening Post* and should be widely disseminated.

The Texas radar tornado warning network, an outgrowth of the first conference, has been furthered considerably. A contract has been entered into between the Texas A & M Research Foundation and the U. S. Weather Bureau to provide for the modification of the necessary radar sets as funds are available. A series of meetings with interested cities has been held. At the time of the writing of this summary, meetings with Houston, Galveston and Fort Worth have already indicated that support will be forthcoming for modification of radar sets. The spirit of the conference was best summarized by an editorial in *The Houston Chronicle* of June 28, which said in part:

“The Meteorological Department of Texas A & M College sponsored a conference to lay groundwork for such a [tornado warning] system. A committee has been appointed to set up the warning service. The latest scientific devices including radar will be employed. Because of the rapidity of modern communications an hour or two of warning of a tornado threatened community will save lives and greatly reduce property damage. The system to be inaugurated may prove one of the most worthwhile projects Texas could have.”

Ed. note: Three things seem exceptional from the above text. First, that within no more than two or three weeks of the causative event - the May 11 tornadoes - invitations were on their way to what turned out to be key individuals to participate in the June meeting at TAMU; second, that all but one of the invited group gathered within a week of notification; and third ... most remarkably ... that so much could have been accomplished by the following November, when the above summary was published. And all without Internet or email!

Perhaps not so remarkable is that even in 1953, the media (as seen in the final quote) seems to have been prone to over-anticipate our warning potential: “... because of the rapidity of modern communications *an hour or two of warning* of a tornado threatened community will save lives and greatly reduce property damage.”

The June 1953 conference was historically significant for several reasons, the most obvious being the development of what came to be called the Texas Radar Project. Regional Director E.L. (“Erle”) Hardy was awarded the Department of Commerce Silver Medal in 1955 for the role he played in that, summarized in an issue of *Weather Bureau Topics*:

With Mr. Hardy’s enthusiastic support and counsel, the Texas Radar Project was developed and a cooperative agreement was consummated with the Texas A&M Research Foundation whereby the Weather Bureau furnished unmodified radar equipment obtained from surplus military stocks and the Foundation with financial support from municipalities modified the equipment for installation in Weather Bureau Offices in Texas and nearby states.

This cooperative project is the first undertaking of its kind in the United States and represents a rare and outstanding contribution of major significance to the people of the United States. Not only is this the first closely knit network of radar stations set up entirely for storm detection purposes, but it is also the first example of such extensive cooperation between Federal, State and Local agencies in the history of the United States.

The “extensive cooperation” noted in the last sentence above refers not just to the radar systems, but also to the closer liaison that developed between Weather Bureau offices and local and state officials during severe weather operations. The June 1953 conference laid the groundwork for better telephone (later radio) communication among offices and agencies, preparedness activities, and even spotter networks. In other words, it can be fairly said that those aspects of today’s NWS severe weather operations are rooted in the June 1953 gathering.

The momentum obvious in Kahan’s November 1953 summary continued to build, so that it was reported in the June 1955 *Weather Bureau Topics*:

By May 1 of this year radar equipment had been installed under [the Texas Radar Project] at 12 cities in Texas and Louisiana, bringing to a total of 19 the number of radar weather installations in the two States ...

This is the first tornado season in which the network has been sufficiently complete as to be effective in the detection and tracking of severe storms such as tornadoes. The observations have proven to be very valuable. On several occasions they have furnished the first tip that severe storms were developing. Such alerts have prompted the issuance of tornado forecasts. In several cases, once tornado forecasts had been issued, local officials, by direct broadcast, have been able to keep the public informed of the exact position of the severe storm by observing and tracking them with radar.

The last sentence above seems to imply local officials had access to radar themselves, or were working in some cases alongside Weather Bureau employees. Perhaps this was a precursor of today’s amateur radio operations at forecast offices. In any case it verifies the foresight of the group which had met two years earlier at Texas A&M to plan for just such close collaboration.