U.S. DEPARTMENT OF COMMERCE
John T. Connor. Secretary

WEATHER BUREAU
Robert M. White, Chief

WEATHER BUREAU SURVEY TEAM

Report of PALM SUNDAY TORNADOES of 1965

APRIL 11, 1965

WASHINGTON, D.C.

1965

FORM CD-121
(11-63)
(PRES. BY
A.O. 206-10)

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

TO : Chairman, Tornado Survey Team

DATE: May 3, 1965

In reply refer to: CWB-1

FROM : Chief of Bureau

SUBJECT: Tornado Warning Survey

I am pleased to see the report submitted to me today by the tornado warning analysis team.

In view of the magnitude of the work involved in preparing this study, it has been completed with amazing speed. In the three weeks since the terrible disaster of April 11, your team has toured the strickened areas and prepared a comprehensive report with recommendations for improvement in methods of alerting the public to hazardous weather conditions.

I shall study your report on this vital matter very carefully. Your findings and recommendations will be given immediate consideration, and appropriate actions to improve public safety will be taken as soon as possible.

Robert M. White

Robert M. White

FORM CD 12
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UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

TO : Chief of Bureau

DATE: May 2, 1965

In reply refer to: MS-1.2

FROM : Chairman, Tornado Survey Team

SUBJECT: Tornado Survey - Series of April 11, 1965, Tornadoes

The tornado survey team which you established on April 12, 1965, has completed its assigned task. Our report, together with our recommendations for your consideration, is attached. Annex II to the report is a review and compilation of all forecasts and of all warnings issued and transmitted by each Weather Bureau office responsible for warnings in those counties affected by the April 11 series of tornadoes

As chairman of the group, I should like to express my appreciation and thanks to all of the members who participated in the survey and particularly for the very timely and efficient assistance of Regional Director Roy Fox and his staff at Kansas City for their help in organizing and conducting the survey, as well as in the gathering and post-analysis of reports from those stations not specifically included in the survey team itinerary.

P. H. Kutschenreuter

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd.)

LIST OF ABBREVIATIONS

MIC - Meteorologist in Charge of Weather Bureau Office

NSSL - National Severe Storms Laboratory, Norman, Oklahoma (see Section IV)

Radar scope- Indicator unit which provides a pictorial representation (usually on the screen of a cathode ray tube) of radar information such as range, height, area, density and bearings of storm echoes.

RAWARC - Radar Warning Circuit. A teletypewriter circuit between most Weather Bureau offices in the tornado and hurricane areas. Used for the exchange of radar information, hurricane and tornado forecasts and warnings and reports of tornado, hurricane and other severe storm occurrences and damage. (See Figure 6.)

SELS - Severe Local Storms Center, Kansas City, Mo. (see Annex 1).

STATUS REP - State User Service Representative. Meteorologist in Charge of one of the Weather Bureau offices in the state (usually the state capitol) who also acts as the statewide channel between the Weather Bureau and users of weather information. Represents the Weather Bureau and its service programs to user groups; evaluates and represents user requirements and complaints to the Weather Bureau. Evaluates statewide effectiveness of Weather Bureau programs from the user requirements standpoint.

SECTION I: INTRODUCTION

A post analysis early on April 12 indicated that the Weather Bureau's tornado forecasts issued on April 11, 1965, were excellent. Yet the reported death toll was already approaching 200 and still rising rapidly. Why?

To answer this question, Dr. Robert M. White, Chief of the U. S. Weather Bureau, appointed a survey team of five Weather Bureau officials (P. H. Kutschenreuter, Deputy Director for Service Programs, Washington, D. C., Chairman and leader of the group; Roy Fox, Regional Director, Kansas City, Mo.; Edwin Kessler, Director, National Severe Storms Laboratory, Norman, Okla.; Allen D. Pearson, Head of Emergency Warnings Branch, Weather Analysis and Prediction Division, Washington, D. C.; Herbert Lieb, Acting Director, Public Information Office, Washington, D. C.). The group assembled in Kansas City on the evening of April 12. The routes covered by various segments of the group and the estimated damage figures and death tolls by state are given in Figure 1 of this report.

The Survey team has subsequently made a more intensive post analysis of the forecasts. This, together with the surveys carried out in many of the affected areas, verified the fact that the tornado forecasts were indeed very good to excellent. This is plainly evident from Figure 2 and the fact that 33 out of the 37 reported tornadoes occurred within the forecast areas. Further, many of those interviewed in the area (officials, and local citizens who suffered property losses but took precautionary action and survived) volunteered that the loss of life would have been much greater except for the forecasts and warnings. As a matter of fact, the calibre of these forecasts provides a striking example of progress in severe weather forecasting since the Severe Local Storm (SELS) Center was first established to carry out this most difficult task some fifteen years ago.* In spite of this, 271 people died. The death toll would have been much higher had it not been for the excellent cooperation of the radio and TV stations in broadcasting the forecasts and warnings throughout the affected areas.

The recommendations which follow (SECTION II) are the recommendations of the survey team to the Chief, U. S. Weather Bureau, and are based upon the findings of the survey as well as an analysis of reports obtained from all Weather Bureau offices in the area. The recommendations are made from the standpoint of importance as factors in connection with the heavy loss of life in the Palm Sunday tornadoes.

Continued research, both basic and applied, is considered so essential that it is difficult to equate it on a priority basis with the operational recommendations. RESEARCH, therefore, is considered separately (see SECTION IV).

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* Prior to that time no attempt was made to forecast tornadoes, although the term "severe local thunderstorms" was sometimes used in instances when tornado development was considered likely; tornado warnings were not issued under any circumstances.

SECTION II: RECOMMENDATIONS OF THE SURVEY TEAM

(Supporting information and further details in connection with each of the following recommendations are given in SECTION III.)

1. Hold preparedness meetings in collaboration with the appropriate Federal, State, county and local government officials and news disseminators in order to develop emergency plans for alerting all segments of communities whenever emergency warnings are issued. Urge news outlets to install positive alerting devices (remoted to the announcer's position where necessary) on weather teletypewriter machines installed on their premises.

2. Saturate the public before and during the season with explanatory material on tornadoes, tornado forecasts, tornado warnings and the appropriate action to be taken in each instance with the assistance of press, radio and TV, schools and community groups.

3. Strengthen severe storm warning reporting networks in local communities and insure that they remain alert and active.

4. Complete the state-wide weather teletypewriter dissemination networks connecting Weather Bureau offices directly with news outlets and provide for interstate connections as necessary.

5. Provide remote narrow bandwidth radar repeater scope (or scopes) to each Weather Bureau office in tornado-prone areas where such office is dependent for protection on a radar in another locality. (Figure 5 is a map of the existing radar network.)

6. Complete the radar coverage with modern WSR-57 type radar for all areas east of the Rocky Mountains as soon as practicable, insuring that all populous areas are well within reasonable radar range and that "blind spots" are reduced to a minimum.

7. Provide back-up emergency radio communications between adjacent Weather Bureau offices and between Weather Bureau and appropriate Civil Defense, state, county and local offices with emergency responsibility.

8. Provide adequate emergency power for all radar installations and all communications equipment (including teletypewriters) at all Weather Bureau offices.

9. Extend the RAWARC circuit to include all Weather Bureau offices in tornado-prone areas. (Figure 6 is a map showing the existing RAWARC system.)

10. Surveys. In addition to surveys such as this one carried out by Weather Bureau staff (and the separate and more intense local surveys carried on for research purposes) occasional surveys should be carried out by behavioral science groups and aimed at evaluating the effects of forecasts and warnings on individual user reactions.

SECTION III: SUPPORTING INFORMATION TO RECOMMENDATIONS OF THE SURVEY TEAM

RECOMMENDATION 1. Hold preparedness meetings in collaboration with the appropriate Federal, State, county and local government officials and news disseminators in order to develop emergency plans for alerting all segments of communities whenever emergency warnings are issued. Urge news outlets to install positive alerting devices (remoted to the announcer's position where necessary) on weather teletypewriter machines installed on their premises.

A large number of people in the areas for which tornado forecasts were issued on April 11 were aware of the forecasts. However, due to a "balmy" Palm Sunday afternoon (the first really pleasant day this year), many were away from radio and TV and did not hear the subsequent warnings. Undoubtedly also, because of the balmy weather existing at the time, many considered that this was just another instance of crying "wolf".

Many had heard tornado forecasts before and hadn't experienced any tornadoes. This is not surprising. The area included in a tornado forecast generally encompasses some 20,000 to 30,000 square miles. The area traversed by an individual tornado averages on the order of four square miles. An average of about two tornadoes occurs in a tornado forecast area. This means that only about 1/3,000 of the area will, on the average, actually experience a tornado. Considering a tornado path on the order of 16 miles in length, on the average only about 1/50 of the area would be within even five miles of a tornado.

It is not surprising, then, that in areas outside the major tornado belt people gradually lose interest in tornado forecasts, especially on a balmy Sunday afternoon. What is needed is a positive alerting system for tornado warnings in addition to the present dependence solely on radio and TV.

Because of the much higher frequency of tornadoes in Tornado Alley (South Central U. S. - the area of most frequent tornado occurrence -- see Figure 3), communities in those areas have adopted an emergency arrangement. The Civil Defense "take cover" siren signal is used as a positive alerting device for tornado warnings. None of the areas visited by the survey team had such an arrangement. Although the forecasts and warnings were issued to recipients on rather extensive telephone lists, except for radio and TV distribution the information in most instances was carried no further.

Since timeliness is the most important element in connection with tornado warnings, every effort must be made to reduce the Weather Bureau offices' telephoning list to an absolute minimum. Telephone calls are time-consuming at best. Those furthest down on the list may not in some cases be

reached until the need for the warning no longer exists. Further, the calls require vital staff time which should more appropriately be spent in tracking the storms and keeping warnings and information up-to-date. Practically all of these telephone calls are to the officials and news distributors in counties in which there is no Weather Bureau teletypewriter connection, but for which the Weather Bureau office placing the call has been assigned warning responsibility. The statewide teletypewriter dissemination network included in Recommendation 4 would eliminate the necessity for most, if not all, of these calls.

Of considerable importance also is the fact that in practically all instances the various news and weather teletypewriter machines at radio and TV stations are located several doors away from the announcer's position. Staffing at radio and TV stations, particularly the smaller stations, is normally at an absolute minimum on Sunday afternoons. While the usual staff may consist of three or more people (news editor, announcer, engineer, etc.), Sunday staffing frequently is reduced to as little as one person who serves as combined news editor, announcer and engineer. Although this employee may make several trips to the news room to clear the machines, important bulletins can go unnoticed for an appreciable length of time. In the case of urgent tornado warnings, this can well be the difference between a timely emergency broadcast or a broadcast after the fact.

Emergency warning transmissions on all Weather Bureau teletypewriter circuits are announced by a customary ten-bell signal. Unless there is an attendant on duty within earshot of the machine, however, this signal will go unnoticed. A positive alerting device, such as an alarm indicator lamp or warning bell, can be connected to the teletypewriter receiver and remotely located to any area. The lamp or bell signal can be programmed to remain activated until a person is alerted, goes to the machine and presses a button or switch to turn the indicator off. The cost for such an installation on each teletypewriter receiver is: $1.75 a month for the control relay, a $5 installation charge for the lamp or bell signal, and about $1 a month recurring charges.

Such a warning device will readily demand immediate attention to emergency warnings. These will hereafter be transmitted under a heading "Emergency Bulletin," repeated five times on successive lines to attract attention, and then followed by the text of the emergency warning. In addition, the present practice of preceding the warning transmission by the customary ten-bell signal will be continued in order to alert those recipients who may not have installed an auxiliary alerting device. This procedure would permit an announcer to advise all listeners to stand by for an urgent emergency bulletin, clearing the way for the text to be broadcast -- perhaps in many instances even as the warning is being received.

RECOMMENDATION 2. Saturate the public before and during the season with explanatory material on tornadoes, tornado forecasts, tornado warnings and the appropriate action to be taken in each instance with the assistance of press, radio and TV, schools and community groups.

The tornado forecast is normally issued for a period of as much as six hours. It designates an area in which severe thunderstorms, damaging winds, hail, tornadoes, are likely to occur.* The initial forecasts are generally issued well in advance of the first storm development. They are subsequently revised and kept up-dated as severe weather begins to develop.

The Weather Bureau tornado warning, on the other hand, is not issued until the actual existence of a tornado has been either positively identified visually by a voluntary observer who has reported the occurrence to the Weather Bureau office, or else identified fairly positively by radar. Based on predetermined upper winds and the tracking of echoes on the radar scope, the path of an identified tornado can be determined with rather high precision. A tornado warning is immediately issued by the Weather Bureau for the counties and communities in its path.

In essence then, a tornado forecast means: 1) don't panic, 2) go about your normal business, 3) either keep tuned to your local radio or TV station for up-to-date information or keep your weather eye open to developing storms (normally in the western quadrant), and 4) be aware of tornado safety rules and have a shelter area or evasive action in mind. A tornado warning, on the other hand, means simply: take cover and do it fast! -- Also, it pays to have a portable radio handy so you can keep up with subsequent developments and the eventual "all clear" signal when given.

For those not having basements for protection, and especially for those in tourist courts, the most expedient action is to determine the path of the tornado, by actual sighting if possible or from the text of the warnings which have been broadcast, and then to proceed at right angles away from the path. A second alternative is to take shelter in a ditch or depression as an emergency measure. All of these and other suggestions are included in the explanatory material mentioned in the following paragraph.

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* A word of caution and explanation should be considered here: The issuance of a tornado forecast for a specific area should not be falsely construed as indicating that no tornado will occur outside the forecast area. It is emphasized that the forecast includes the area in which tornadoes are most likely to occur. The forecast areas are purposely kept as small as practicable in order to avoid needlessly alerting the populace of an unduly large area. Those in counties adjacent to tornado forecast areas should maintain at least a casual watch on local weather developments.

The Weather Bureau has published and distributed thousands of copies of informational pamphlets and leaflets which include tornado safety rules. Civil Defense, Red Cross and others have published and distributed thousands of additional copies. In addition, films and recordings of explanations have been made and distributed. Because of the relative infrequency of tornadoes in the area, however, only a few people remembered the rules, apparently none had them available, and, in the rush of the emergency, very few of the radio and TV stations could find and broadcast their own copies.

Very few of those interviewed in the tornado affected areas were aware of the difference between a tornado forecast and a tornado warning. Accordingly, there was no real feeling of urgency even among most of those who actually heard the warnings on radio and TV. The "warning" was generally interpreted as just an up-dated statement of the tornado forecast.

NOTE: None of the above statements should in any sense be interpreted as at all critical of the performance of radio and TV stations in the affected areas. On the contrary, all were very cooperative. Without their absolutely essential contribution, the loss of life would have been much greater. The overall effectiveness of this valuable emergency service must be further improved, however, and by intensive cooperative effort on the part of both the Weather Bureau and the broadcasters, it can and will be materially improved.

For example: Following the transmission of each tornado forecast and warning on the local weather teletypewriter loop, the Chicago Weather Bureau Office transmitted the text of precautionary suggestions to be broadcast following the broadcast of the forecast or warning. This eliminated the necessity for the radio station to search for the appropriate material. This will be standard practice on all local weather teletypewriter loops hereafter, using perforated tape prepared in advance and kept on file for just such emergencies.

RECOMMENDATION 3. Strengthen severe storm warning reporting networks in local communities and insure that they remain alert and active.

Warning responsibility for every county in the U. S. has been assigned to a specific Weather Bureau office. Several years ago it was standard procedure for the Meteorologist in Charge of each Weather Bureau office each spring to visit designated severe weather observers in the counties for which he was assigned warning responsibility.

These voluntary observers were instructed in the identification of tornadoes and provided with a private telephone number to be used in reporting these occurrences to the responsible Weather Bureau office.

Time and travel funds for such organizational visits have been inadequate in recent years. Instead of the annual visits, the voluntary severe weather observers who had previously been recruited are now queried by letter and requested to complete and return a postcard indicating their availability and willingness to continue in the program.

In the absence of tornadoes or other severe storms over extended periods of time, the interest of such voluntary observers gradually diminishes. Fewer and fewer cards are returned and in many areas the voluntary observing corps has diminished to the point where it consists almost entirely of state and local police, firemen, etc. While the contributions of these officials has been most helpful, without an adequate network of fixed reporting locations throughout an area, the development of many tornadoes can go unreported for a matter of several minutes -- precious minutes in connection with advance warning.

Personal visits to such voluntary observers are highly desirable both before and during the seasons of severe weather in order to develop and maintain their cooperation and enthusiasm, and particularly during extended periods of relative inactivity. As a first approximation toward meeting staffing requirements for this purpose, it is urged that one additional employee be assigned in each state. The person in this position should preferably be assigned to the station with STATUS REP responsibilities. This extra position could then be made available to relieve the STATUS REP from routine duties for sufficient periods to visit his reporting network, to make other essential contacts throughout the year, and to assist in organizing emergency alerting procedures. In addition, the employee would be detailed for relief periods to the other Weather Bureau stations in the state for similar purposes at sufficient periods throughout the year.

> RECOMMENDATION 4. Complete the state-wide weather teletypewriter dissemination network connecting Weather Bureau offices directly with news outlets and provide for interstate connections as necessary.

In any weather emergency situation, areas having direct access to a teletypewriter system connected with a Weather Bureau office receive the most direct warning service. Other areas are dependent on other means of

communications which involve one or more relays and consequent delays. Also, the weather service in these other areas is not as complete as in areas where there is a local Weather Bureau office unless adequate communications are available.

A state-wide teletypewriter circuit with transmitting connections in every Weather Bureau office in the state and with receiving connections available in every community would provide equal and continuously available weather information and warnings to all communities whether or not they have a local Weather Bureau office. Such a circuit would also provide a measure in emergency "fail-safe" possibilities. If communications from a particular Weather Bureau office were disrupted, an adjacent office would provide forecasts and warnings in the interim.

Such an arrangement should also include provision for interstate connections; for example, South Bend should be connected with Chicago. Also, the present local circuits should be integrated into the state-wide circuits; since nearby Weather Bureau offices transmit an appreciable proportion of similar material on their respective circuits, overall transmission requirements at each Weather Bureau office would be reduced somewhat.

> RECOMMENDATION 5. Provide remote narrow bandwidth radar repeater scope (or scopes) to each Weather Bureau office in tornado-prone areas where such office is dependent for protection on a radar in another locality. (Figure 5 is a map of the existing radar network.)

Because of the high cost (both dollars and personnel) it is impracticable to install an elaborate and up-to-date weather radar at every Weather Bureau office. Those offices having direct access to a radar have an obvious advantage over offices without a local radar installation.

To partially overcome this handicap at non-radar offices, the radar operators of large weather radars maintain a "watch" over weather developments which may affect those areas not having a radar installation. They prepare and transmit hourly radar summaries over the RAWARC circuit. These are consolidated into severe weather charts for larger areas which are transmitted by facsimile weather circuits.

As the seriousness and urgency of the situation develops, verbal descriptions are conveyed by telephone directly from the radar operator to the meteorologist responsible for the warnings. This is time-consuming, both on the part of the radar operator and on the part of the Meteorologist in Charge who must receive, digest and utilize the information.

In the case of multiple echoes, the radar operator naturally gives priority attention to the most intense radar echo areas. This could operate to the detriment of Weather Bureau offices in other areas where echoes may not be as intense (or may have diminished for a while) but subsequently increase. For example, the Chicago radar operator, by giving most emphasis and attention to the much stronger echo areas in the Wyatt-Dunlap-Elkhart area, may not have sufficiently emphasized the importance of the echoes near Grand Rapids. Fortunately, however, the Grand Rapids staff, on the basis of available Chicago radar information plus limited Muskegon radar reports and other information, recognized the seriousness of the situation and issued a forecast for "severe thunderstorms with large hail and damaging winds" an hour and a half before the tornado itself developed. This forecast was up-dated at 5:50 p.m. to include "a tornado or two." The Michigan State Police have indicated that the forecast which included the damaging wind statement was especially effective and accurate.

Direct transmission of a radar scope picture by means of ordinary telephone lines is now possible to any number of repeater scopes at remote locations. Further design, development and testing at the NSSL (see SECTION IV) indicates very promising results for transmission and receipt, using a digitized procedure with pictorial display. This new type of equipment is entirely compatible with the very limited number of slow-scan equipment which has already been installed at a few locations.

The installation of such equipment at each of our offices, and its eventual availability for connection to such circuits in large metropolitan areas in which we have no offices, will aid materially in providing essential timely and completely up-dated information, minute by minute. It will enable our meteorologsts to provide radio and TV with a blow-by-blow description of the development and path of all severe thunderstorms and tornadoes.

RECOMMENDATION 6. Complete the radar coverage with modern WSR-57 type radar for all areas east of the Rocky Mountains as soon as practicable, insuring that all populous areas are well within reasonable radar range and that "blind spots" are reduced to a minimum.

Radar is acknowledged as the most valuable single tool in assessing the intensity, changes in intensity and movement of squall lines and thunderstorms. Although the radar does not provide positive identification of tornadoes in all instances (the developing tornado may be imbedded in or beyond an excessively heavy precipitation area), it frequently assists in identifying potential tornado areas and does provide a reliable means of tracking the paths of severe thunderstorms and those tornadoes which have developed.

There are still important gaps in our radar network east of the Rocky Mountains. Further, several of the radars still in use are the less effective and less reliable WSR-1 to WSR-4 and the SP-1 models (see Figure 5). A case in point is the temporary difficulty with the Muskegon radar. These are rapidly becoming obsolete. Some are in a state of disrepair, replacement parts are no longer available and it has become necessary to begin shutting down some and cannibalizing them for parts to keep the more essential ones in operation. Action is underway for replacement of these older type radars by the more efficient and effective WSR-57 type. These plans should be implemented with all practicable speed.

RECOMMENDATION 7. Provide back-up emergency radio communications between adjacent Weather Bureau offices and between Weather Bureau and appropriate Civil Defense, state, county and local offices with emergency responsibility.

During a severe storm emergency, landline communications are highly vulnerable. There were a number of instances of communications failures as a result of landline disruptions during the Palm Sunday tornadoes. In some instances this delayed or prevented the receipt of essential information and in other instances caused important delays.

Similarly, communications disruptions between the Weather Bureau office and appropriate Civil Defense, state, county and local offices which have emegency responsibility caused some delay. Emergency backup FM radio communications, frequently used and tested, is essential in order to minimize the inherent dangers of loss of communications during such critical periods.

RECOMMENDATION 8. Provide adequate emergency power for all radar installations and all communications equipment (including teletypewriters) at all Weather Bureau offices.

Communications and the performance of local equipment, such as the very important radars, were disrupted or lost in some instances due to power failure. If we are to approach a "fail-safe" operation, the installation, maintenance and frequent testing of emergency power equipment at each Weather Bureau office is essential in tornado areas as well as in hurricane areas.

RECOMMENDATION 9. Extend the RAWARC circuit to include all Weather Bureau offices in tornado-prone areas. (Figure 6 is a map showing the existing RAWARC system.)

The RAWARC teletypewriter circuit (Figure 6) is used for rapid internal communications between Weather Bureau offices and between Weather Bureau offices and the SELS center. It provides a two-way channel for the immediate distribution of severe weather forecasts from the SELS center to the local offices, for the transmission and exchange of local warnings issued by our respective offices, as well as for the immediate transmission of severe local storm and tornado reports to the SELS center. This is a prerequisite to keeping on top of severe storm developments and revising and up-dating forecasts and warnings.

Although all Weather Bureau offices in the major tornado areas have connections to this circuit, there is need for further extension into some areas not currently included.

RECOMMENDATION 10. Surveys. In addition to surveys such as this one carried out by Weather Bureau staff (and the separate and more intense local surveys carried on for research purposes) occasional surveys should be carried out by behavioral science groups and aimed at evaluating the effects of forecasts and warnings on individual user reactions.

The survey undertaken as the basis for this report provided considerable valuable information for recommendations for improvement in the communications and information flow from the meteorologist through the various news outlets to the public. Even perfect forecasts and warnings, were they possible, are still of only very limited value unless they are communicated to someone who has a need for them and uses the information as a basis for action.

Earlier in this report it was mentioned that there was no feeling of urgency on the part of many people, even though they actually heard the broadcast of tornado warnings. As meteorologists the Weather Bureau staff did a very good job. To make sure that our product is effectively used, however, we require the assistance and advice of other disciplines such as the journalists, the behavioral scientists, etc. Frequent surveys such as this one, by meteorologists, should be supplemented occasionally by surveys undertaken by behavioral scientists and others. This will help us tailor our forecasts and warnings so as to generate the appropriate and necessary response.

SECTION IV: RESEARCH

The progress in severe weather forecast development mentioned in the Introduction to this report is a direct result of practical and applied research as well as the application of the results of basic research to the everyday forecast and warning problems. The initial applied research was carried out by a dedicated group of forecasters assigned to the SELS unit when it was first established.

Subsequently the National Severe Storms Project, which included the cooperation of several government agencies, universities and private research groups, was established by the Weather Bureau in the spring of 1960. During 1962 a radar laboratory was established at Norman, Oklahoma. It was equipped with a number of specialized radars to assist with the severe local storm investigation being carried on in that area.

The installation has since been designated the National Severe Storms Laboratory (NSSL) and has become the Weather Bureau's center of research and development for severe storms and radar meteorology. It has comprehensive observing facilities, strong in-house scientific talent and manages a program in which many agencies of government, education and commerce participate.

Continued support for both the basic and applied research and development being carried out at the NSSL is essential to further improvement and refinement of our severe storms forecasting and warning responsibilities. Promising means for identifying severe storms in the early stages of their development, tracking them accurately and communicating information about them are being developed. The results of such investigations may eventually provide an aswer to the question of the ultimate practicability of influencing or inhibiting certain severe storm developments. A brief resume of some of the more important projects now being carried on by the NSSL is given in the following paragraphs.

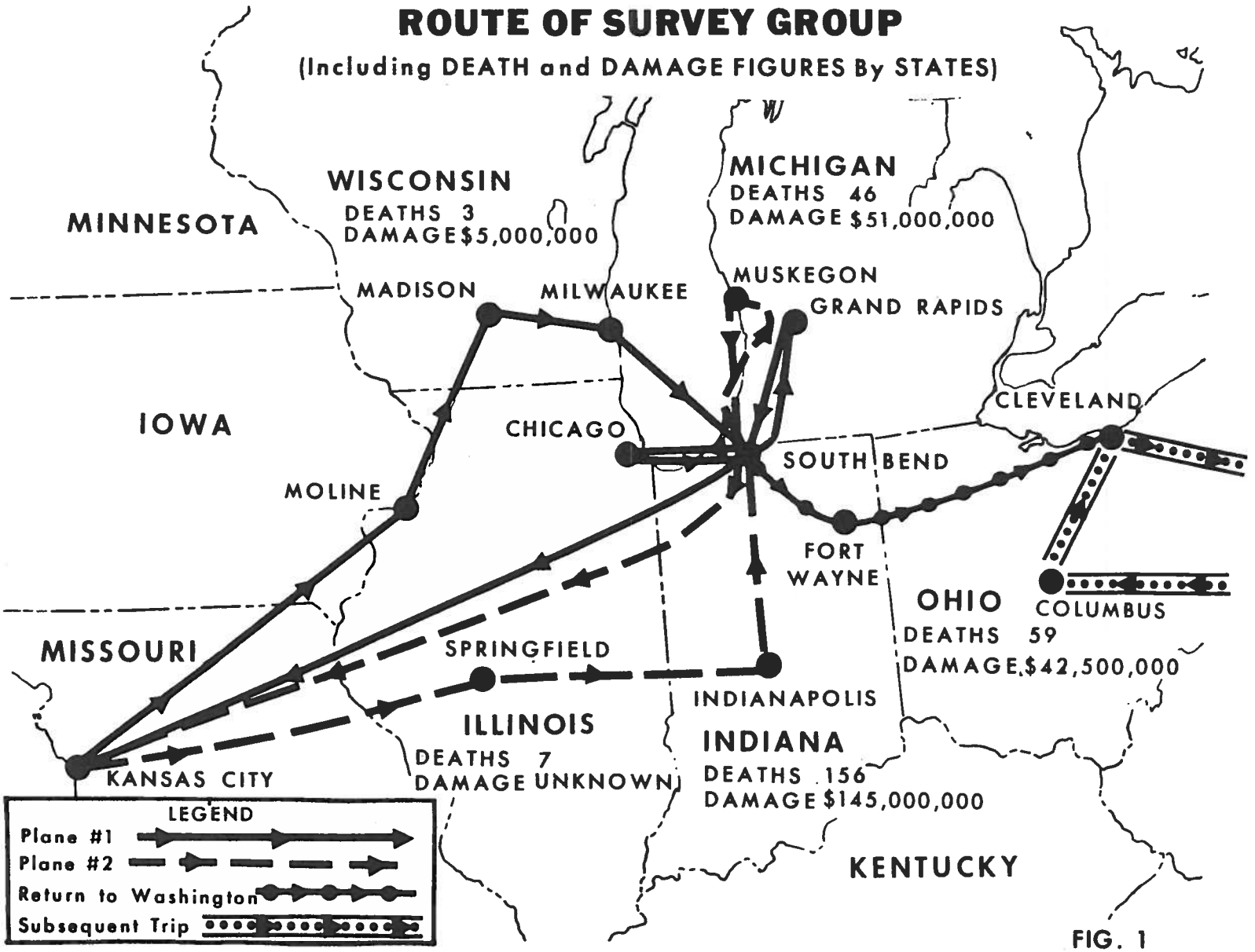
Promising means for identifying severe storms in early stages of their development, tracking them accurately, and communicating information about them, are being developed at NSSL.

A prototype Doppler radar is being tested. It measures the phase shift associated with the radial motion of scattering. This phase shift is proportional to the radial wind speed. It seems likely that a tornado breeding storm will show a characteristic Doppler signature which can be a basis for earlier accurate warnings.

A new system for accurate radar data and transmission via phone lines for remote PPI display and computer processing has passed initial trials at NSSL and is being programmed for implementation in the National Meteorological System.

While radar may be used to give an indication of the distribution of water content and wind, the electrical manifestation of storms is absent from the conventional radar display. A three-station system and processing-central for locating lightning discharges at ranges between 30 and 150 miles has snown very promising early results and is being further developed this year. The combination of time series data concerning storms' electrical properties with the associated distributions of wind and moisture also promise important new research benefits.

Measurement-oriented research conducted at NSSL would be benefited by the addition of stations to the 52 observing locations already maintained by the Laboratory. The present stations are not sufficiently close together to provide needed storm descriptions in the detail which can be effectively examined with new technical aids. Also, meteorological sensors should be purchased and installed on the 1,500-ft. WKY television tower. This is an important adjunct to the network of surface stations.


ROUTE OF SURVEY GROUP
(Including DEATH and DAMAGE FIGURES By STATES)
MINNESOTA
WISCONSIN
DEATHS 3
DAMAGE $5,000,000
MICHIGAN
DEATHS 46
DAMAGE $51,000,000
MADISON
MILWAUKEE
MUSKEGON
GRAND RAPIDS
IOWA
CHICAGO
CLEVELAND
SOUTH BEND
MOLINE
FORT WAYNE
OHIO
COLUMBUS
DEATHS 59
DAMAGE $42,500,000
MISSOURI
SPRINGFIELD
INDIANAPOLIS
ILLINOIS
DEATHS 7
DAMAGE UNKNOWN
INDIANA
DEATHS 156
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KANSAS CITY
KENTUCKY
LEGEND
Plane #1
Plane #2
Return to Washington
Subsequent Trip

FIG. 1

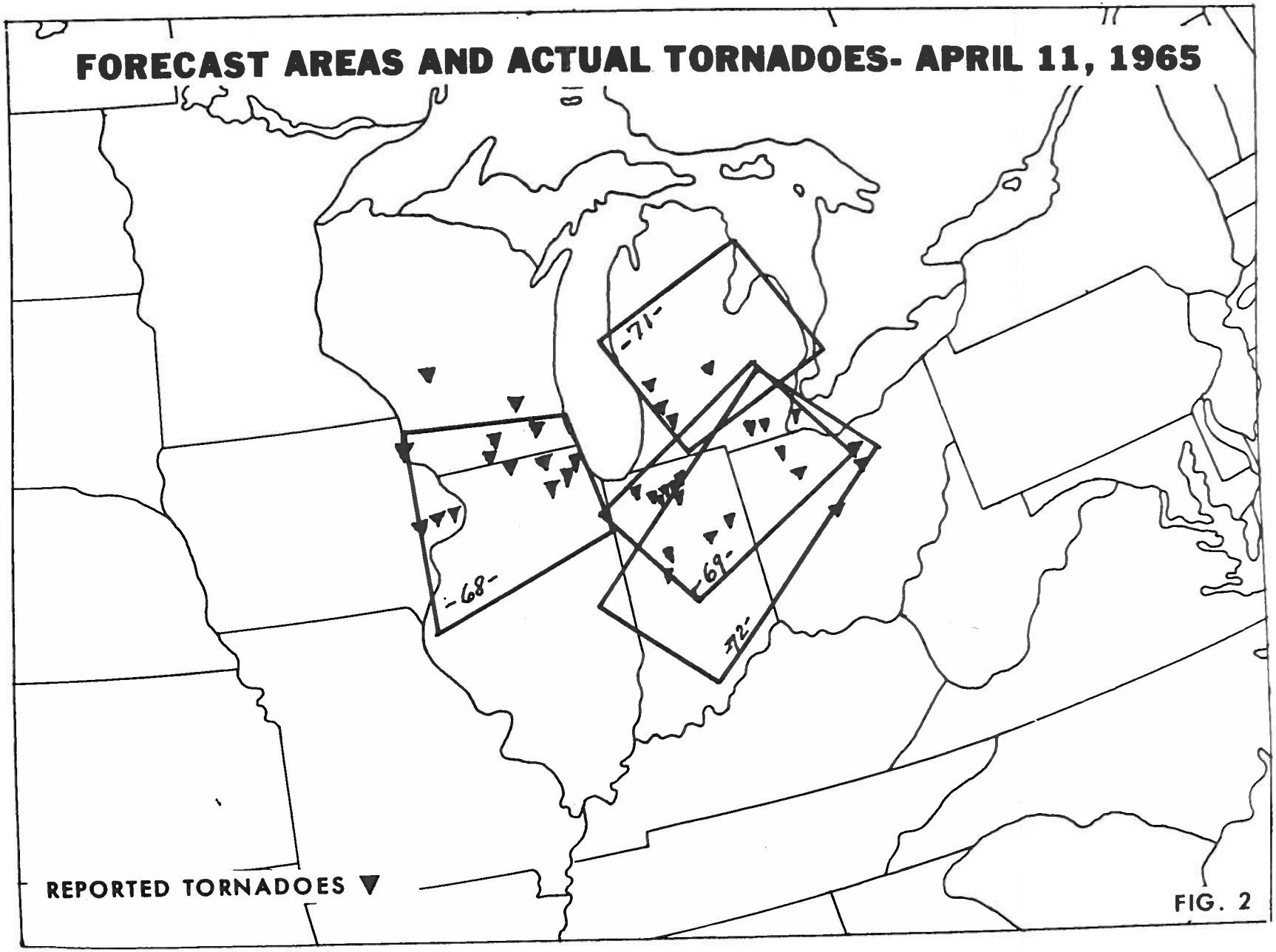
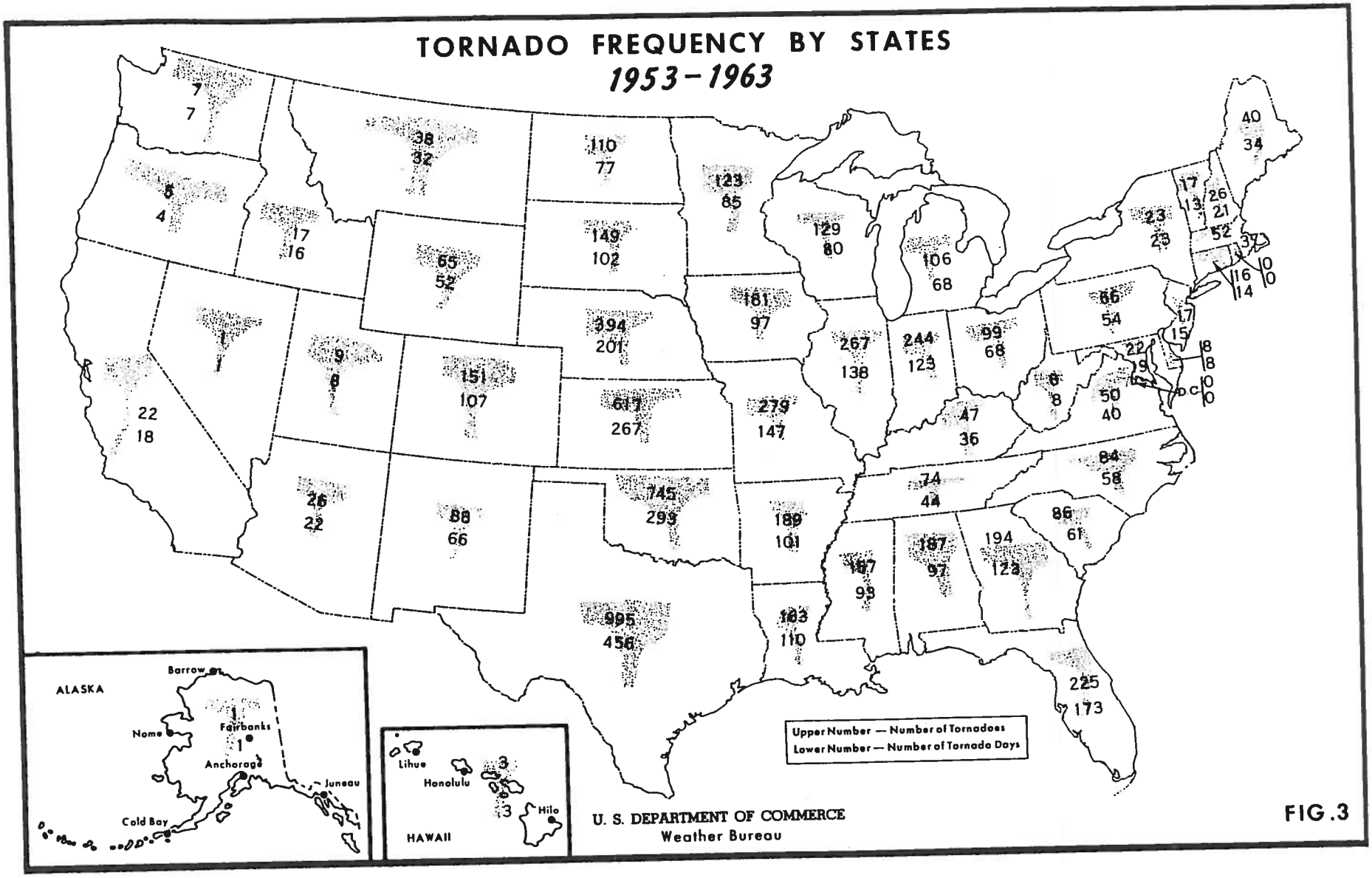

FORECAST AREAS AND ACTUAL TORNADOES- APRIL 11, 1965
-71-
-68-
-69-
-72-
REPORTED TORNADOES ▼

FIG. 2


TORNADO FREQUENCY BY STATES
1953-1963
7
7
38
32
110
77
123
85
40
34
8
4
17
16
65
52
149
102
129
80
106
68
17
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36
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40
84
58
26
22
88
66
745
299
189
101
74
44
86
61
187
97
194
123
187
93
995
456
183
110
225
173
Upper Number — Number of Tornadoes
Lower Number — Number of Tornado Days
ALASKA
Barrow
Nome
Fairbanks
1
1
Anchorage
Juneau
Cold Bay
Lihue
Honolulu
3
3
Hilo
HAWAII
U. S. DEPARTMENT OF COMMERCE
Weather Bureau

FIG. 3

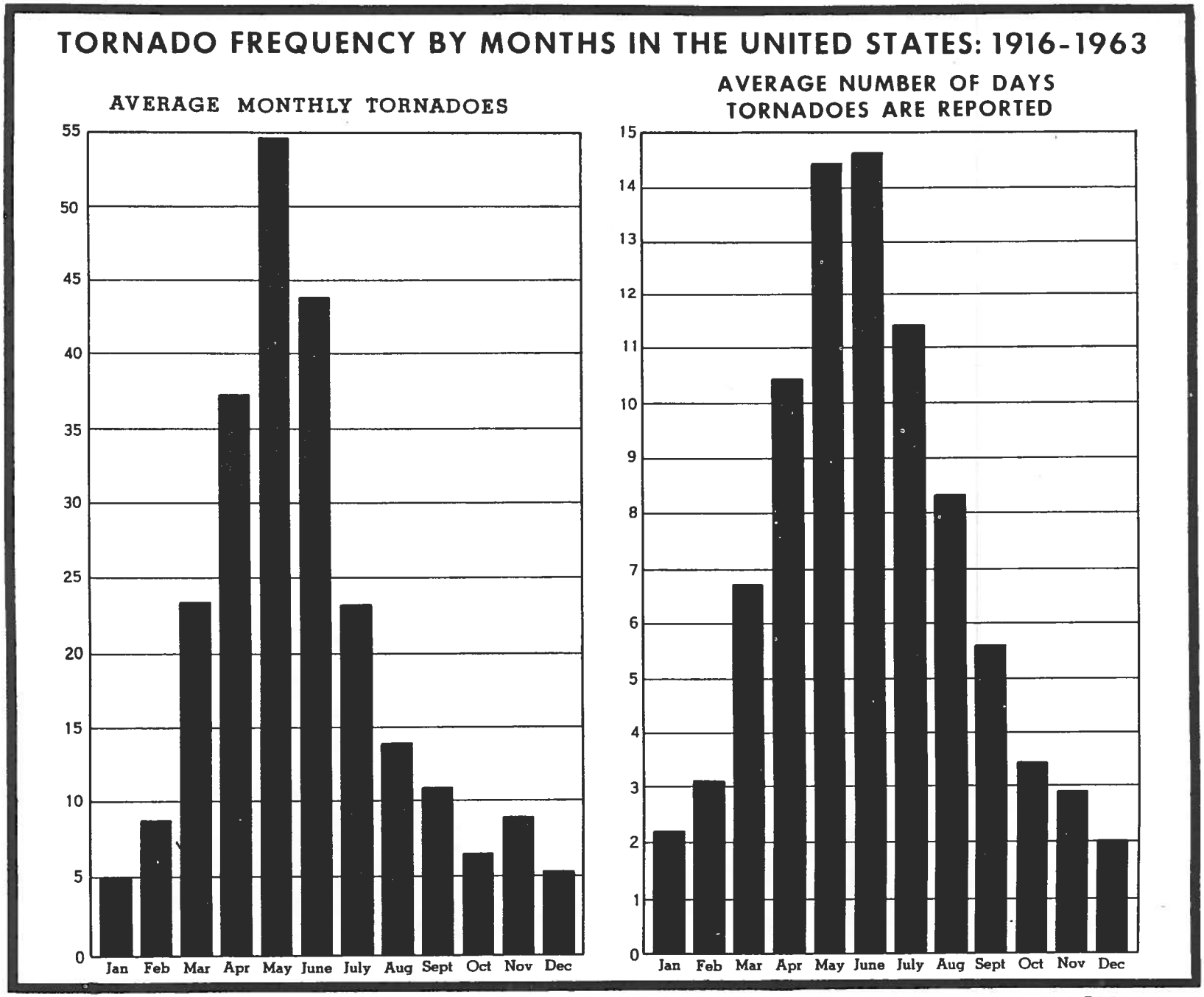

TORNADO FREQUENCY BY MONTHS IN THE UNITED STATES: 1916-1963
AVERAGE MONTHLY TORNADOES
55
50
45
40
35
30
25
20
15
10
5
0
Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec
AVERAGE NUMBER OF DAYS TORNADOES ARE REPORTED
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

FIG. 4

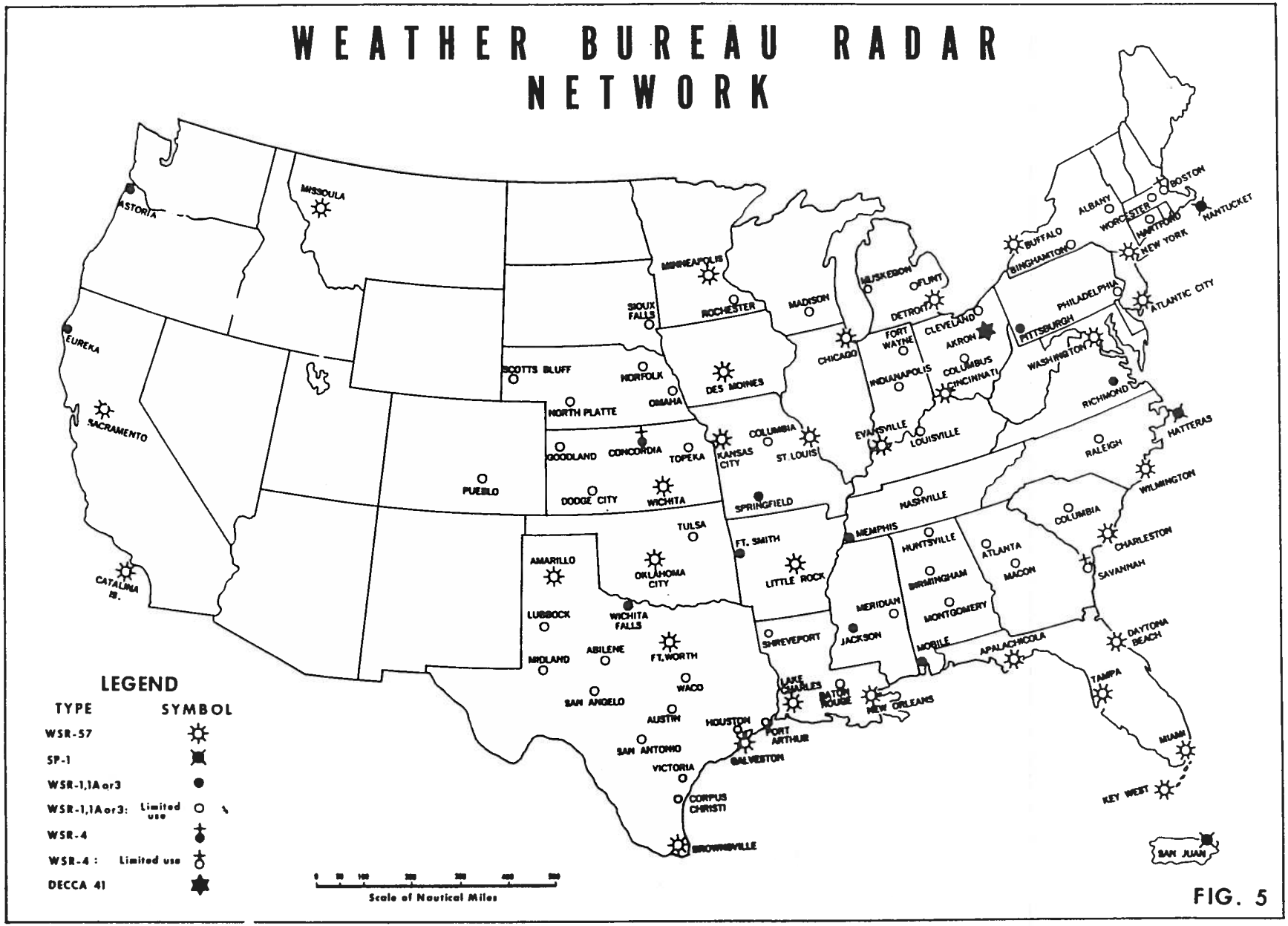


FIG. 5

UNITED STATES DEPARTMENT OF COMMERCE

WEATHER BUREAU

April 1965

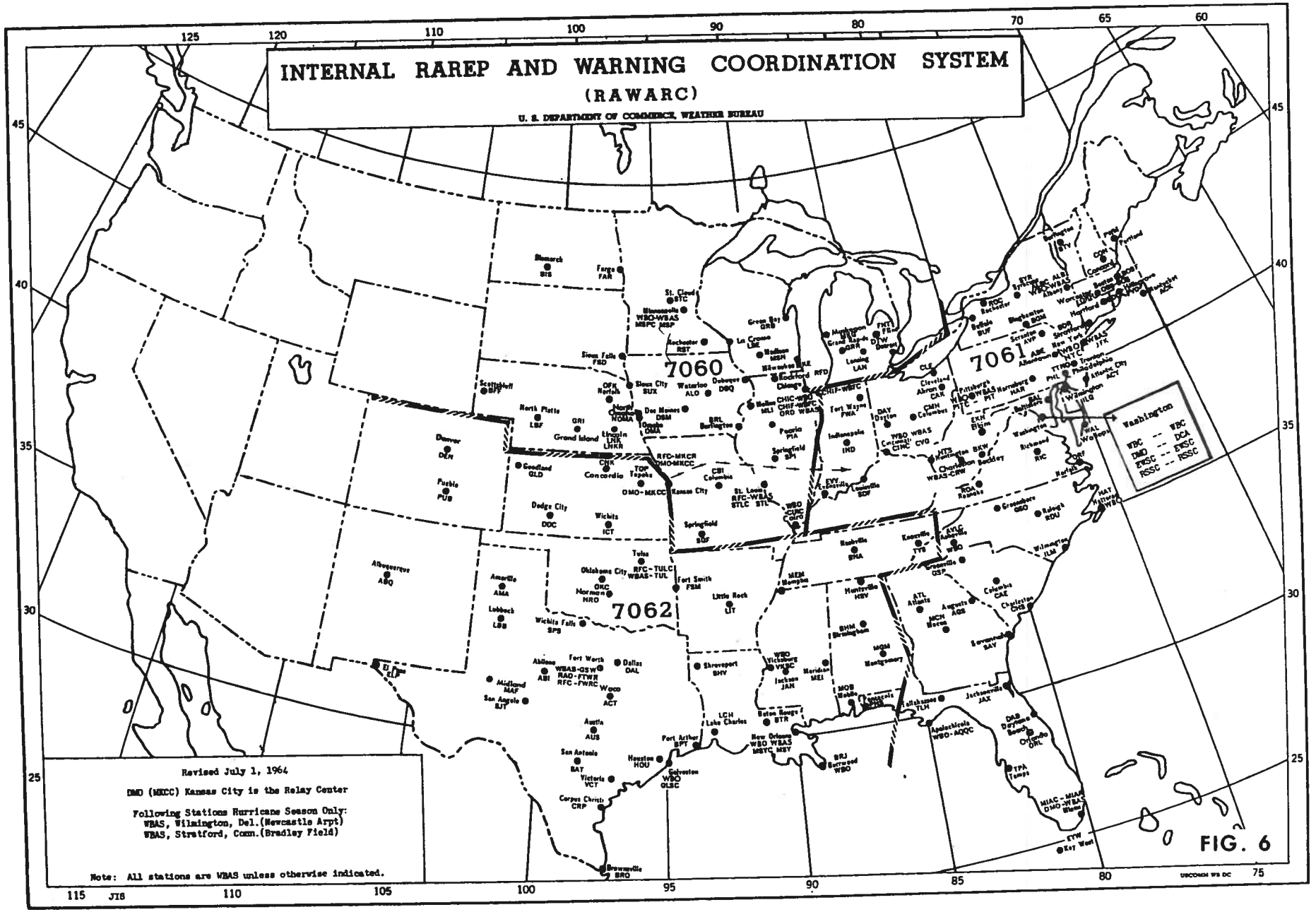

INTERNAL RAREP AND WARNING COORDINATION SYSTEM
(RAWARC)
U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
7060
7061
7062
Washington
WBC
DMO --- DCA
EWSC --- EWSC
RSSC --- RSSC
Revised July 1, 1964
DMO (MKCC) Kansas City is the Relay Center
Following Stations Hurricane Season Only:
WBAS, Wilmington, Del.(Newcastle Arpt)
WBAS, Stratford, Conn.(Bradley Field)
Note: All stations are WBAS unless otherwise indicated.

FIG. 6

TORNADO FORECAST AND WARNING SERVICE PROGRAM

The Weather Bureau maintains a severe local storm forecasting service center (SELS) at Kansas City where specialists devote full attention to the development of severe thunderstorm activity with which tornadoes are usually associated. This center issues each morning an outlook giving the most likely areas of severe thunderstorm activity for the subsequent 24-hour period. These outlooks are issued for the information of all forecast offices whenever it is deemed advisable to mention the possibility of severe local storm development in the morning forecast; also, to assist all offices with preliminary planning for additional staffing, etc., in the event that a public severe weather forecast is issued later.

The SELS Center then maintains a continuous watch on the possibility of severe local storm development. When the weather data, including radar information, show more definite indications of local storm development the Center issues severe weather forecasts. These are issued if possible six hours in advance of expected severe weather, but with an average lead time of about 1½ hours. The areas are usually confined to about 20,000 to 30,000 square miles.

An IBM 1620 computer is used at the SELS Center to speed up the processing of hourly reports received on teletypewriter circuits and to make computations from changes in surface pressure patterns and stability of the air. These computations alert forecasters to areas that are frequently associated with the development of severe local storms.

By mid-summer (1965) a high speed teletypewriter circuit will be available. This will reduce the data collection time to about 15 minutes. With a new higher speed computer which is to be installed, the processing will be completed in another 5 minutes, so that 20 minutes after observation time every hour, processed information will be ready for use by the SELS Center in issuing and up-dating severe weather forecasts.

Local Weather Bureau offices, using the SELS severe weather forecasts as guidance, issue local severe weather forecasts specifying the counties that are included in the forecast. Every county in the U. S. is included in the assignment of a nearby Weather Bureau office for warning responsibility.

Severe weather warnings are issued when the radar shows a typical tornado type echo or when a funnel or tornado is observed and reported to the Weather Bureau. These warnings are issued by local Weather Bureau offices. They warn the public of the approach and path of severe local weather conditions as reported and as observed and tracked by radar.

Follow-up severe weather statements are distributed by all offices that have distributed a severe weather forecast or warning. These provide information about new weather developments or the lack of developments. Statements are also issued to clarify false rumors of severe local storms.

"All clear" statements are released and distributed by all offices that have made public distribution of the severe weather warning or forecast to indicate that the threat has ended.

During a severe weather situation the Weather Bureau gives first priority to preparing and distributing forecasts and warnings of any weather that may threaten lives and property. During these emergencies other routine work such as the preparation of local forecasts, taking local observations, etc., may have to be temporarily suspended in order to take appropriate action to safeguard lives and to reduce damage to property.

Prior to and during the tornado season, efforts are made to acquaint the public with the tornado forecast and warning activities of the Weather Bureau through descriptive material and tornado films which are furnished public outlets through the public information program. Motion pictures are loaned free to television stations, civic groups and schools. Tornado slides are used to advantage at public and civic group meetings where talks are given by Weather Bureau employees. Much written material such as "Tornadoes -- What They Are and What To Do About Them," "Community Action Against Tornadoes," "Tornado Safety Rules," "Community Tornado Safety," and similar public information releases are distributed to news outlets in order to reach the greatest number of people. Public and private organizations are encouraged to reproduce and distribute the information as widely as possible.

Another preparatory step is to establish community networks. The Weather Bureau has a responsibility for issuing the weather warnings to the public. However, the time required to receive reports of a tornado and to relay warnings back to a threatened community can be disastrous to the first locality in the path of such a storm. For this reason, towns are encouraged to establishing reporting and warning systems for their localities. Their reports of actual tornado occurrences are relayed immediately to police and radio networks and also to the nearest Weather Bureau office where warnings are issued concerning the expected movement of the tornado. Contacts are maintained with state police and state press headquarters to achieve maximum cooperation. The assistance of national defense industries and installations is also solicited.

In summary the sequence of Weather Bureau public releases is as follows:

a. Distribute severe weather forecasts.

b. Include mention of expected severe weather in routine public forecasts.

c. Issue severe weather statements, up-dating releases as appropriate.

d. Issue severe weather warnings based on network reports or on radar reports.

e. Issue all-clear statements.

PALM SUNDAY TORNADOES OF 1965
APRIL 11, 1965

HISTORICAL

The Palm Sunday tornado outbreak affected six midwestern states and was the Nation's worst tornado disaster in 40 years. At least 37 separate tornadoes have been identified over a six state area encompassing Iowa, Illinois, Wisconsin, Michigan, Indiana and Ohio. The death toll of 271 is exceeded only by the March 18, 1925 tornado outbreak in Missouri, Illinois, and Indiana when 689 persons were killed and 1,980 injured.

METEOROLOGICAL SITUATION

Three meteorological conditions, necessary for tornado formation, converged over the upper Mississippi valley on Sunday, April 11, 1965. Warm moisture-laden air streamed northeastward from the Gulf of Mexico, ahead of a fast moving low pressure area. Approaching equally fast from the west was a mass of relatively dry cooler air. Thunderstorms began to form along the boundary of the two differing air masses shown in Figure 1, a not uncommon springtime occurrence. Figure 2 shows the upper air flow for the same day. A much stronger than normal jet stream dominated the central United States and flowed over the area where thunderstorms were beginning to form. Wind speeds aloft were generally on the order of 140 miles an hour at the maximum level (above that of Figure 2) with an absolute maximum of 185 mph over Dodge City, Kansas prior to tornado formation.

TABLES AND ILLUSTRATIONS

FORECASTS

The Severe Local Storms Center, hereafter abbreviated as SELS, is located at Kansas City, Missouri and provides the basic forecasts of expected thunderstorms, hail, damaging winds and tornadoes for the United States. The Weather Bureau's severe local storms program consists of:

1. Identification of potential areas of thunderstorm, damaging wind, hail or tornado areas up to 24 hours in advance. This information is made available to other Weather Bureau forecast offices to assist the offices with preliminary planning in the event that a public severe weather forecast is issued later.

2. Issuance of a Severe Weather Forecast by SELS. This is a forecast issued for the likelihood of thunderstorms, damaging winds, hail or tornadoes. The forecast is generally for an area of 25,000 to 30,000 square miles.

3. Severe Weather Warning. These are forecasts issued by local Weather Bureau offices to warn the public of the approach of severe local weather conditions already in existence or imminent.

SYNOPSIS OF SELS ACTIVITIES FOR APRIL 11, 1965
(All times CST for this portion only.)

On the 0900 CST surface chart (three hours before Figure 1) a tornado threat was recognized for northeastern Missouri across central Illinois to north central Indiana. A second threat area existed for the area from northern Arkansas across southeastern Missouri to extreme southwestern Indiana.

At 10:45 SELS issued a severe weather forecast for the area from northeastern Missouri northeastward to north central Indiana. At 11:00 a second tornado forecast was issued for the area from northern Arkansas northeastward to extreme southwestern Indiana.

The analysis of the surface chart for 1000 CST indicated that a rapid change was taking place. The complex low pressure system was organizing into one major center in western Iowa and beginning to move northeastward. From this and other factors it became apparent that the tornado threat area was developing further north and northeastward than earlier anticipated. Because of this the SELS forecast issued the forecast shown in Figure 3, time of issuance was 1:00 PM. The first tornado had occurred 15 minutes prior to the issuance but this was not known to the SELS forecaster.

When a Severe Weather Forecast is issued by SELS the local Weather Bureau offices in the affected area begin to issue local statements prior to actual tornado sightings, and severe weather warnings after actual tornado sightings or corroborating radar evidence. These issuances are shown in the appendixes with each SELS forecast.

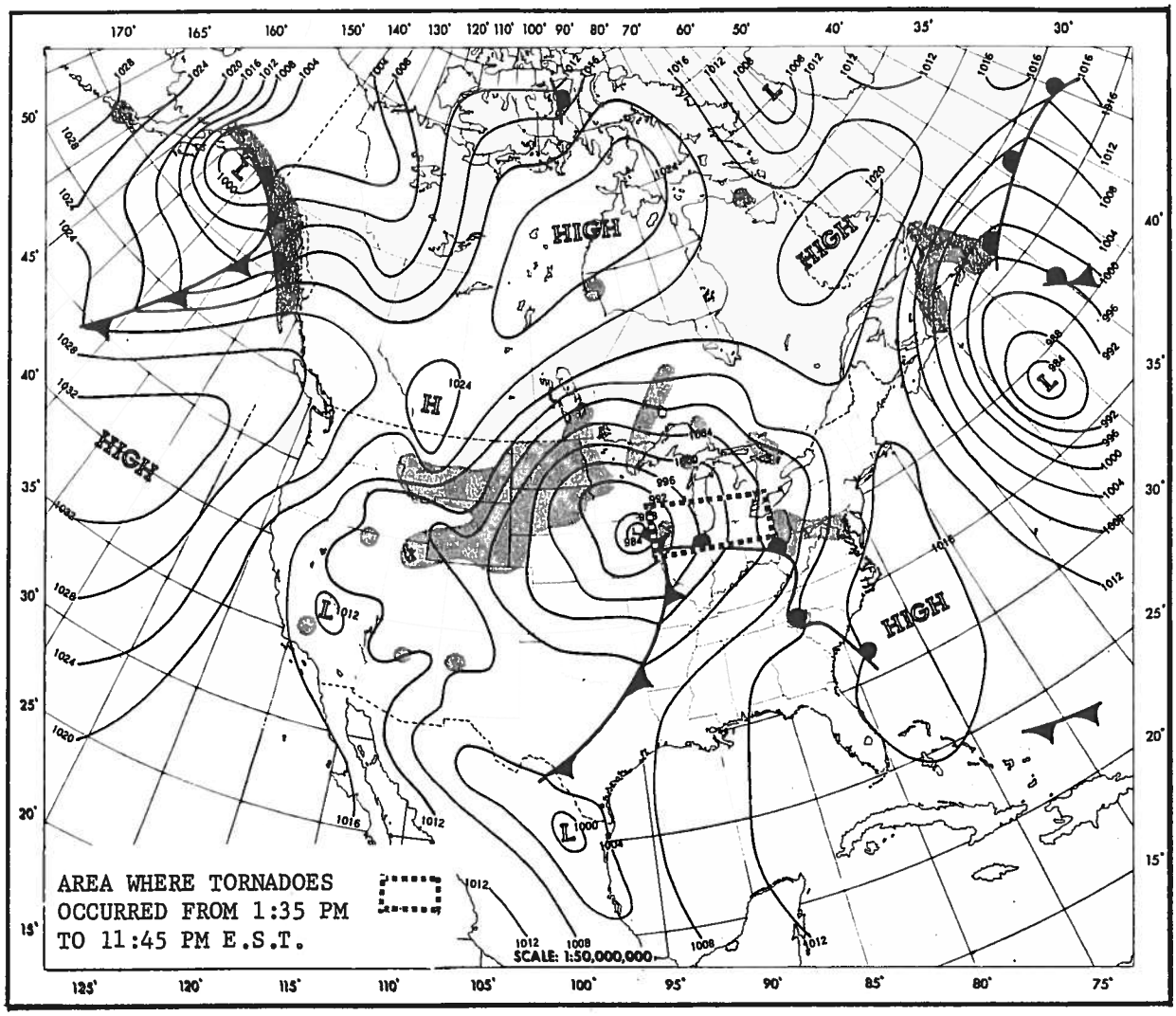
By 2:00 PM the surface low center had taken a path more towards the east, was still intensifying and was moving forward at 50 miles an hour. Computer data indicated that a potential threat was developing from southeastern Missouri northeastward through southern Illinois into central Indiana. Analysis of the upper wind field for 12:00 noon indicated that the jet stream was branching into two currents and that a strong upward motion was taking place over southern Wisconsin and northern Illinois. Connected with this was the development of a new low pressure center over extreme northeastern Illinois and a rapid northeastward movement of the warm front.

Based on this new development the SELS forecaster issued a severe weather forecast for the area from northwestern Indiana northeastward to southeastern lower Michigan, as shown in Figure 4.

Analysis of the 5:00 PM data confirmed the existence of two distinct low pressure centers, the main center in south central Wisconsin and the second center in extreme southwestern Michigan. At 6:00 PM the SELS forecaster issued a severe weather forecast for portions of southern lower Michigan as shown in Figure 5. With considerable severe weather activity already occurring through lower Michigan and Indiana the forecaster extended the previous forecast for this area with a new severe weather forecast for the area from west central Indiana northeastward to northern Ohio. The forecast was issued at 7:10 and is shown in Figure 6.

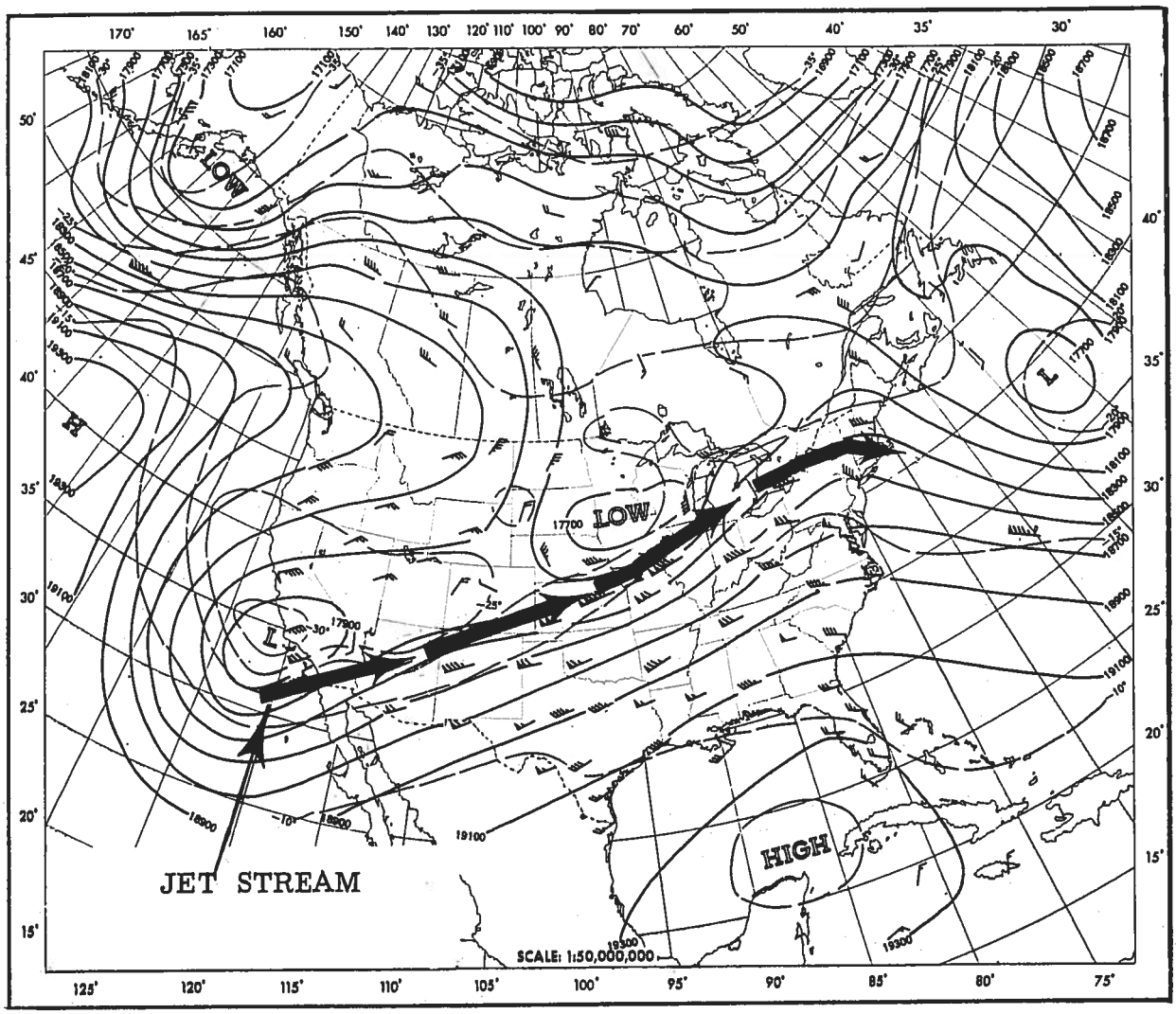
The computer analysis for 8:00 PM indicated the tornado threat area was concentrated over extreme northeastern Indiana, northwestern Ohio and southeastern lower Michigan. Severe thunderstorms would likely continue throughout the evening into the early morning hours from western Ohio eastward.

FIGURE 1



SURFACE WEATHER MAP AT 1:00 P. M. E.S.T.
APRIL 11, 1965

FIGURE 2



500 - MILLIBAR HEIGHT CONTOURS AT
7:00 P. M. E.S.T. April 11, 1965 Continuous
lines inciate height contours in feet above sea level.
Dashed lines are isotherms in degrees Celsius.
Arrows show wind direction and speed at the 500-mb,
level. (Arrows same as on surface map.)

TABLE 1
TORNADOES IN FORECAST AREAS
(All times are CST.)

Tornado Forecast			Number Tornadoes in Forecast Areas
No.	Issued	Valid Time	
68	1:00 PM	1:00 PM-6:00 PM	10
69	4:20 PM	4:20 PM-8:00 PM	14
71	6:00 PM	6:00 PM-8:00 PM	4
72	7:10 PM	8:00 PM-Midnight	5
		TOTAL	33

TABLE 2

TIMES AND LOCATIONS OF TORNADOES

No.	Time of Tornadoes CST PM	Time of Forecast CST PM	Alert Time Hrs.	Alert Time Mins.	Location of Tornado
1	12:45	1:00	0	15 late	Lowden (38 ESE of Cedar Rapids), Iowa
2	12:45	1:00	0	15 late	Clinton (75 E Cedar Rapids), Iowa
3	1:30	1:00	0	30	Marquoketa (32 S Dubuque), Iowa
4	2:26	1:00	1	26	Monroe (35 SSW Madison), Wis.
5	3:00				3 E Watertown (30 E Madison), Wis.
6	3:00	1:00	2	0	Rockton (15 N Rockford), Ill.
7	3:00	1:00	2	0	Evansville (20 S Madison), Wis.
8	3:27	1:00	2	27	Crystal Lake (25 NW Chicago)-Island Lake, Ill. (11 mile path)
9	3:30	1:00	2	30	Harper's Ferry,Iowa,(45 S La Crosse,Wis.)
10	3:35	1:00	2	35	4 E East Troy (30 SW Milwaukee), Wis.
11	3:50	1:00	2	50	Druce Lake (40 NNW Chicago)-N Gurnee, Ill. (6 mile path)
12	4:00	1:00	3	0	Geneva (5 E St. Charles-25 W Chicago),Ill.
13	4:05	1:00	3	5	Zion-Waukegan, Ill.
14	4:15				4 W Tomah (40 ENE La Crosse), Wis.
15	5:10	4:20	0	50	Lapaz (15 S South Bend),-NW Plymouth (22 S South Bend), Ind.
16	5:10	4:20	0	50	Nappanee (205 E South Bend), Ind.
17	5:25	4:20	1	5	5 SE Valparaiso (36 WSW South Bend),Ind.
18	5:30	4:20	1	10	Dunlap (18 SE South Bend),Ind. (2 funnels)
19	5:45	4:20	1	25	Near Koontz Lake (20 SW South Bend),Ind.
20	5:45	4:20	1	25	20 SE South Bend, Ind.
21	6:00	6:00	0	0	Grand Rapids-Rockford (15 N Grand Rapids), Mich. (30 mile path)
22	6:00	6:00	0	0	Burnips-Corning (15 SW Grand Rapids),Mich.
23	6:00	4:20	1	40	Wyatt (8 S South Bend), Ind.
24	6:10	4:20	1	50	5 S Lafayette, Ind.
25	6:15	4:20	1	55	Coldwater Lake (31 SW Jackson), Mich.
26	6:20	4:20	2	0	Moran (18 E Lafayette), Ind.
27	6:30	6:00			12 NW Kalamazoo, Mich.
28	6:30	4:20	2	10	Hillsdale (23 SSW Manitou Beach), Mich.
29	7:05	6:00	1	5	DeWitt (6 N Lansing), Mich.
30	7:27	4:20	3	7	Milan (7 S Detroit), Mich.
31	8:00	4:20	3	40	NW Berne (20 SSE Fort Wayne), Ind.
32	8:00	4:20	3	40	near Van Wert (28 ESE Fort Wayne), Ind.
33	8:00	8:00	0	0	Radnor (20 N Columbus), Ohio
34	8:07	8:00	0	7	Marion(33 SW Fort Wayne), Ind.
35	9:30	8:00	1	30	4 S Tiffin (23 E Findlay) - Ohio Pittsfield (19 SW Cleveland)-La Grange-Grafton
36	9:30	8:00	1	30	Columbia Hills-Strongsville 5 SE Cleveland, Ohio
37	9:45	8:00	1	45	Brunswick (25 SSW Cleveland), Ohio

SEVERE WEATHER FORECAST NUMBER 68

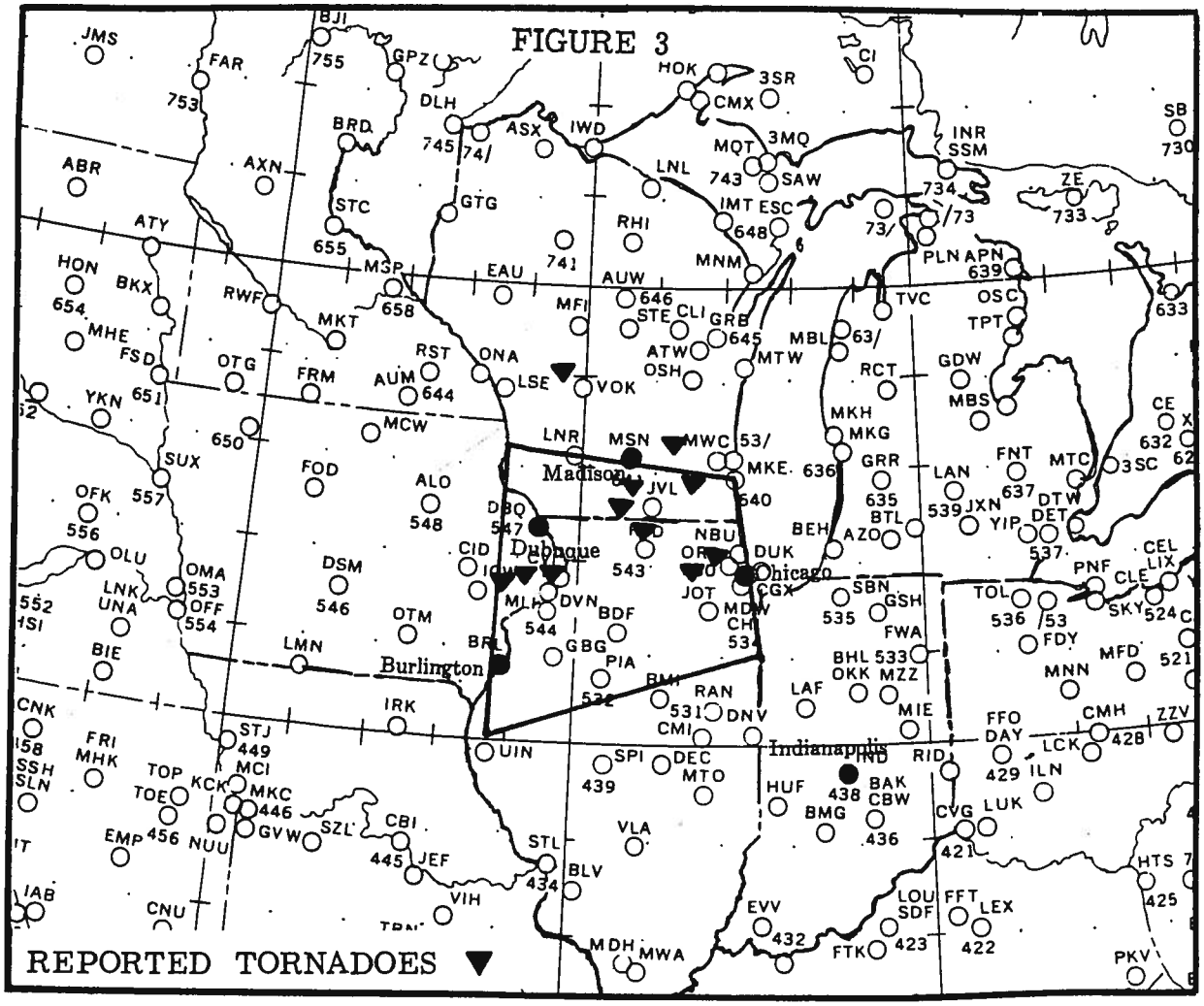
ISSUED 100 PM CST APRIL 11 1965

U.S. WEATHER BUREAU TORNADO FORECAST FOR....

EXTREME SOUTHERN WISCONSIN
EXTREME EASTERN IOWA
PORTIONS OF NORTHERN ILLINOIS

A FEW SEVERE THUNDERSTORMS WITH LARGE HAIL DAMAGING WINDS AND ONE OR TWO TORNADOES ARE EXPECTED FROM 1 PM UNTIL 6 PM CST THIS SUNDAY AFTERNOON AND EVENING IN THE AREA BOUNDED BY THE POINTS 40 MILES SOUTH OF BURLINGTON IOWA TO 50 MILES WEST OF LONE ROCK WISCONSIN TO MILWAUKEE WISCONSIN TO 40 MILES SOUTH EAST OF CHICAGO ILLINOIS BACK TO THE POINT 40 MILES SOUTH OF BURLINGTON IOWA.

WOOD....1906Z



LOCAL STATEMENTS, WARNINGS AND ACTIONS TAKEN BY LOCAL WEATHER BUREAU OFFICES FOR FORECAST AREA #68.

DES MOINES, IOWA

11:45 a. m. Des Moines Radar Weather Report. During the past 2 hours an area of showers and thunderstorms has been developing in Iowa. It is now located in a band about 50 miles wide running east and west across the state from the Waterloo area westward to between Carroll and Storm Lake. The strongest thunderstorms in this band are located along a line from Fort Dodge to Waterloo. The thunderstorms are moving toward the northeast at about 30 mph. End.

* * * * * * * * * *

12:45 a. m. Des Moines Radar Weather Report. The showers and thunderstorms in Iowa are now fairly numerous and are located in an area enclosed by a line from Storm Lake to Iowa Falls to Iowa City to Decorah to Algona back to Storm Lake. Throughout north central and into northeast Iowa . The showers are indicated mostly of light to moderate intensity with a band of rather strong thunderstorms along a line just south of Mason City to about 10 miles north of Cedar Rapids and is about 20 miles wide. The showers are moving toward the northeast at about 35 mph. End.

* * * * * * * * * *

2:25 p. m. Des Moines Radar Weather Report. At this time the showers and thunderstorms are located in north-central and northeast Iowa to the north of a line from Kossuth County to Webster County to Southern Allamakee County.

Another area of showers and thunderstorms has developed in east-central Iowa and is now located in an area enclosed by a line from Blackhawk to Marshall to Jasper to Poweshiek counties.

The very strong thunderstorms that were located in the eastern portion of Iowa north of Moline have moved northeastward out of Iowa. End.

Actions taken:

1. Sent above report over public teletype writer loop at 11:45 CST.
2. Advised Dubuque of strong radar returns over Stockton, Illinois at 2:12 CST.

APPENDIX 3-A

ROCHESTER, MINNESOTA

Local Statement issued at 12:50 CST. An area of thunderstorms are now moving from northern Iowa into southeast Minnesota. There is a chance this afternoon for local areas of hail and heavy rains.

Actions Taken
1. Distributed 12:50 CST statement to local users.

WATERLOO, IOWA

Local Statements issued: none.

Actions Taken
1. Distributed locally the report on tornado at Lowden, Iowa-at 12:55 CST.
2. Distributed locally the report on hail-just east of Waterloo- at 1:20 CST.
3. Distributed locally the severe weather forecast for southern Wisconsin, extreme eastern Iowa and northern Illinois, at 1:35 CST.
4. Checked with UPI and AP at 1:55 CST to see if severe weather warning had been distributed over wire services, it had.

PEORIA, ILLINOIS

Local Statement issued at 1:06 p.m. A few thunderstorms with large hail, damaging winds and one or two tornadoes are expected from 1:00 p.m. until 6:00 p.m. CST this Sunday afternoon and evening in the area bounded by the points 40 miles south of Burlington, Iowa to 50 miles west of Lone Rock, Wisconsin to Milwaukee, Wisconsin to 40 miles south-east of Chicago, Illinois back to the point 40 miles south of Burlington, Iowa. This includes the counties of Peoria, Fulton, Knox, Warren, Bureau, Stark, Putnam, Marshall, Woodward and Tazewell.
* * * * * * * * * * *

Local Statement issued at 2:10 p.m. No storms have been reported in the Peoria area.
* * * * * * * * * * *

Local Statement issued at 3:17 p.m. All clear.

Actions Taken:
1. Issued local statement at 1:06 p.m.
2. Phoned to Peoria Fire Dept. and Civil Defense 1:30 p.m.
3. Phoned to radio stations WSIV, WZOE, WRAM, WAIK, WGIL between 1:40 and 1:54 p.m.
4. Issued local statement at 2:10 p.m.
5. Issued all clear at 3:17 p.m.

DUBUQUE, IOWA

Local Statements: The following material was broadcast over Dubuque radio stations:

1:10 CST. About 1 p.m. today a tornado was reported 32 miles NW of Moline, Illinois and was headed north-northeastward toward this area. Residents of Dubuque Jo Daviess county in Illinois and in the southwest Wisconsin counties should be alert for the possibility of a tornado until around 2 p.m. as this thunderstorm passes. Additional severe thunderstorms are possible especially to the east of the Mississippi River until 6 p.m. today.

1:45 CST. Here is a Tornado Warning from the Dubuque Office of the U.S. Weather Bureau....First - the threat of the tornado to the city of Dubuque has now ended. About 1 p.m. a thunderstorm with a tornado was reported NW of Moline moving NNE. At 1:30 p.m. the thunderstorm containing the tornadoes was west of Maquoketa headed NNE. It should continue moving in that direction and pass to the east of the city of Dubuque. Residents of Jo Daviess county, southeast Grant county and in LaFayette county should be alert to the possibility of a tornado until 2:30 p.m. Other thunderstorms spotted around Luxemburg and Fayette are moving northeastward but are not considered dangerous. We are in direct touch with radars following these storms and further advices will be issued every 15 minutes.

2:00 p.m. CST At 1 p.m. a thunderstorm with a tornado was reported NW of Moline and moving NNE. At 1:45 it was located north of Maquoketa moving NNE. At 2 p.m. it is around Galena headed NNE and should continue moving in that direction. Residents of Jo Daviess SE Grant county and LaFayette county should be alert to the possibility of a tornado until 2:30 p.m. We are in direct touch with radars following the storms and further advices will be issued every 15 minutes.

2:15 p.m. CST Around 2 p.m. heavy rain and high winds occurred around Andrew, Iowa and heavy rain, high winds and some hail have been reported over Elizabeth, Illinois. At 2 p.m. the thunderstorm cloud was visible off to the NE of the Dubuque airport. Residents of SE Grant and western La-Fayette counties should be alert to take cover when the thunderstorm approaches. The threat to Jo Daviess and Grant counties has ended.

DUBUQUE (Continued)

2:30 p.m. CST — The threat of a tornado continues for LaFayette county Wisconsin and the residents should be alert for the possibility of a tornado until 3 p.m. The threat of a tornado has ended for northeast Iowa, northwest Illinois and for Grant county in Wisconsin. About 1 p.m. this afternoon a tornado dipped down out of a thunderstorm 32 miles NW of Moline, Ill. near Clarence, Iowa moving NNE. Since then the thunderstorm has curved to the right and hail and heavy rains and high winds have been reported east of Andrew and west of Bellevue and then around 2 p. m. at Elizabeth, Ill. We are in constant touch with radar tracking this storm and further advices will be issued when necessary. For the rest of the area the forecast is Partly cloudy with a few showers or thunderstorms this afternoon. Southerly winds 20-30 mph strong, gusts to 60 mph, high temperature near 70. Partly cloudy and a little cooler tonight and Monday. Low tonight around 40. High Monday around 60.

3:30 p.m. CST — The threat of a tornado continues for the eastern part of LaFayette county in SW Wisconsin but the threat of a tornado has ended for NE Iowa, NW Illinois and for Grant county in Wisconsin. No further bulletins will be broadcast concerning this tornado which moved northeastward to the SE of Dubuque this afternoon. At about 1 p.m. this afternoon a tornado dipped down out of a thunderstorm 32 miles NW of Moline, Ill near Lowden, Iowa moving north-northeastward. Since then the thunderstorm has curved to the right and moved into extreme southern Wisconsin to around the Monroe area at the present time. Heavy rains, hail and high winds have been reported east of Andrew, just west of Maquoketa, through Bellevue, and then about 2 p.m. at Elizabeth, Ill. moving into the Stockton area where it also brought heavy rain, some hail and strong winds. The immediate Dubuque area had brief showers and strong winds between 60-70 mph at times and these winds will continue quite strong this evening, then gradually diminish tonight. The line of thunderstorms which spawned this tornado is now moving off to the northeast of here and there are rather strong cells along the line, one at Monroe, Wis., another NE of Lancaster and a third NNE of Prairie du Chien, Wis., but they will no longer affect our area. So here is the latest forecast for the local area - Partly cloudy and mild with a few showers or thunderstorms this afternoon. Southwesterly winds 40-50 mph with a few gusts to 70. Partly cloudy and cooler with winds gradually diminishing tonight. Low temperature around 40. Partly cloudy and cooler Monday. High temperature around 60.

DUBUQUE (Continued)

Actions Taken:

1. Advised sheriff of Jackson county, Iowa about tornado report at Lowden.
2. Made first emergency broadcast at 1:10 p.m. CST.
3. Advised Dubuque county sheriff on warnings for Dubuque, Grant, LaFayette and Jo Daviess counties.
4. Made second emergency broadcast at 1:45 p.m. CST.
5. Made third emergency broadcast at 2:00 p.m. CST.
6. Advised Shullsburg police of warnings at 2:00 p.m. CST.
7. Made fourth emergency broadcast at 2:15 p.m. CST.
8. Made fifth emergency broadcast for eastern part of county at 2:30 p.m. CST.
9. Broadcast all clear statement for most of the area in sixth emergency broadcast.

MILWAUKEE, WISCONSIN

Local Statements:

Severe Weather Forecast Number 68
Issued at 1 PM April 11 1965
U.S. Weather Bureau Tornado Forecast for

Extreme Southern Wisconsin
Extreme Eastern Iowa
Portions of Northern Illinois...

A few severe thunderstorms with large hail damaging winds and one or two tornadoes are expected from 1 PM until 6 PM this Sunday afternoon and evening in the area bounded by the points 40 miles south of Burlington Iowa to 50 miles west of Lone Rock Wisconsin to Milwaukee Wisconsin to 40 miles south southeast of Chicago Illinois back to the point 40 miles south of Burlington Iowa...

In Wisconsin severe weather forecast no. 68 includes an area south of a line from Milwaukee Madison to Lone Rock on westward to the Mississippi River..
Released at 125 PM Sunday

* * * * * * * * * *

Revised Forecast for Zones 4 5 and 6 south of a line from Milwaukee Madison Lone Rock and Prarie Du Chien

Cloudy and warmer this afternoon with chance of a few severe thunderstorms with local hail damaging winds and the possibility of a tornado or two in the area until 6.00 PM CST. Showers ending tonight and turning cooler. Monday mostly cloudy and cooler.

Low Tonight 34/40 high Monday 45/53 lower near Lake Michigan.
Released at 2:00 PM CST

* * * * * * * * * *

Revised Forecast for Milwaukee and vicinity at 1.40 PM Sunday April 11 1965.

Severe thunderstorm warning. Mostly cloudy and warmer with thunderstorms this afternoon. Chance of damaging winds and hail and possibility of a tornado in the area until 6 PM. Tonight showers ending. Monday cloudy and Colder. Low tonight mid 30s high Monday low 40s. Southeast winds 10 to 20 MPH this afternoon much stronger in any thunderstorms. Winds shifting to north to northeast 13 to 30 MPH later tonight and Monday.

* * * * * * * * * *

The following Tornado Warning is authorized by the U.S. Weather Bureau at Milwaukee 3.15 PM CST

A tornado was observed near the Wagon Wheel located near Beloit in Rock County at 3 PM information received from the Walworth County sheriff. The tornado is moving in a northeasterly direction. People in the vicinity of Jefferson Waukesha Dodge Washington Rock and Walworth Counties are cautioned to be on the alert during the next 30 to 60 minutes and take appropriate safety precautions. If this storm is seen in your vicinity notify the Milwaukee Weather Bureau at once. Phone 744 8000 collect.

Please do not make telephone calls to the Weather Bureau requesting information about this storm.

We repeat please do not make telephone calls to the Weather Bureau requesting information about this storm.

If additional information or warnings are necessary they will be broadcast by this station.
End sent 3.22 PM CST.
* * * * * * * * * * *
Issued at 3.30 PM CST
Another report of tornado at Evansville Wisconsin 20 miles south southeast of Madison. Reported by Rock County sheriffs office at 3 PM CST.
* * * * * * * * * * *

Issued at 3.35 PM CST
Add Ozaukee Sheboygan and Fondulac Counties to tornado alert issued at 3:15 PM CST.
* * * * * * * * * * *

Special weather release from Weather Bureau at Milwaukee.
Please add Milwaukee and Racine Counties to the tornado warning. Several funnel clouds sighted in vicinity.
Sent 3:45 PM Sunday
* * * * * * * * * * *

Many reports of hail strong winds and funnel clouds reported in southeastern Wisconsin. Please continue tornado warning as early stated. Tornado reported 2 and 1/2 miles southwest of East Troy at 1 3.55 PM. Demolished a barn. Please exercise precautions.

MKCC A MKE# Public reports tornado touched town 4 miles west of Tomah Wisconsin 40 east northeast of LaCrosse 2215Z. Demolished barn and silo.
End sent 2245.
* * * * * * * * * * *
Funnel cloud visible from the Milwaukee Airport estimated to be 5 to 10 miles south southwest of the airport with movement to the northeast.
4.15 PM
* * * * * * * * * * *
Funnel cloud reported in vicinity of 116th and Silverspring moving northeast.
4.15 PM
* * * * * * * * * * *
Garage down in south side of Waukesha moved 30 feet and flattened.
4.20 PM
* * * * * * * * * * *
From the Weather Bureau to....Press....Radio....TV

Many thanks for your cooperation today during the period of devastating weather. Bulletins were promptly distributed to the public and many of you called us on the phone to give us information that you had received from other sources. This mutual help aids us in putting out further warnings and advisories and this in turn helps the public in that they do not have to call the Weather Bureau and jam our lines. It is vital that they be kept open for incoming reports of severe weather.
Our thanks to you again...

MKCC - Kansas City, Missouri
MKE - Milwaukee, Wisconsin

SUMMARY OF TORNADO PATHS OVER SOUTHERN WISCONSIN-April 11, 1965

From a report by Rheinhardt W. Harms, MIC Milwaukee Weather Bureau

Lowden, Iowa Tornado Path

The most severe began at Lowden, Iowa at 12:45 CST and moved northeastward to Maquoketa, Iowa then on to Monroe, Wisconsin. From Monroe it continued northeastward to Evansville and Johnson Creek to four miles east of Watertown, Wisconsin about 3:30 PM and to Ashippun. Speed of forward movement was computed at 58 miles an hour. The track averaged about a half a mile wide.

Eagle, Wisconsin

The second track was from Eagle northeastward across Capitol Drive to 116th and Silver Spring in northern Milwaukee, thence to Lake Michigan. Damage was lesser on this track with only a funnel cloud reported aloft when the thunderstorm cloud reached northern Milwaukee.

Rockton, Illinois

The third track extended from Rockton (Wagon Wheel), Illinois , to Clinton, Wisconsin to East Troy (at 3:55 PM) to 7th and State streets in Milwaukee 4:30 PM). The tornado moved forward at 55 miles an hour. Preliminary damage reports suggest that a great amount of skipping was done by this storm. Only a funnel cloud was sighted over Milwaukee.

Williams Bay

The fourth track was from Williams Bay, along the shore of Lake Como, northeastward to Cudahy. Heavy damage was inflicted at Williams Bay on about a 1/4 mile wide track with only a funnel cloud sighted southwest of General Mitchell Field, Milwaukee and at Racine.

MOLINE, ILLINOIS

Local Statements Issued; none.

Actions Taken:
1. Received report on tornado near Lowden, Iowa at 12:45 CST.
2. Relayed report to SELS at 12:55 CST.
3. Advised Illinois State Police for relay to Iowa State Police at 12:50 CST.
4. Disseminated severe weather warning #68 to local radio and television and to outlying radio stations between 1:05 and 1:29 p.m. CST.
5. Issued all clear at 3:12 p.m. CST.

ROCKFORD, ILLINOIS

Local Statements: Issued at 1:15 CST. A few thunderstorms with large hail, damaging winds and one or two tornadoes are expected for Winnebago, Stephenson, Carroll, Whiteside, Ogle, Lee, De Kalb, Boone and McHenry counties, from 1:00 p.m. CST until 6:00 p.m. CST this Sunday afternoon and evening.

Actions Taken:
1. Called warning to Winnebago County Sheriff at 1:15 p.m. CST.
2. Called warning to Rockford City Police at 1:17 p.m. CST.
3. Called warning to telephone answering service at 1:18 p.m. CST.
   a. The telephone answering service called Rockford radio stations WROK, WRRR, WJRL, WLUV and Rockford TV stations WTVO and WREX.
   b. The telephone answering service passed the forecast to all hospitals in the area.
4. Called warning to Beloit radio station WBEL at 1:20 p.m. CST.
5. Called warning to Beloit radio station WGEZ at 1:24 p.m. CST.
6. Called warning to Illinois state police at 1:25 p.m. CST.
7. Called out-of-city radio stations between 1:25 and 1:36 CST, stations were WMCW in Harvard, WSDR in Sterling, WFRL in Freeport and WLBK in De Kalb.

CHICAGO, ILLINOIS

Local Statements: Released 1:15 pm. CST Sunday April 11 1965
For extreme southern Wisconsin
Extreme eastern Iowa
Portions of northern Illinois...
A few severe thunderstorms with large hail damaging winds and one or two tornadoes are expected from 1PM. until 6PM. CST this sunday afternoon and evening in the area rounded by the points 40 miles south of Burlington Iowa to 50 miles west of Lone Rock Wisconsin to Milwaukee Wisconsin to 40 miles south south east of Chicago Ill back to the point 40 miles south of Burlington Iowa.
This includes all of Chicago and vicinity
End
* * * * * * * * * *
All radio and TV stations please read this material after the tornado forecast just issued.
Many people are alarmed unnecessarily when the Weather Bureau issues a tornado forecast. A tornado forecast is issued whenever conditions are such that one or more tornadoes may develop over a certain area. It is not possible to pin-point the exact spot where they might occur. Most people in the area mentioned in the tornado forecast will not be affected even if tornadoes should develop.
What you can do when a tornado forecast has been issued...
The Weather Bureau suggests that people take preliminary action so that a place of safety can be reached quickly if a tornado is sighted... or if a warning is issued that a tornado is approaching...above all keep calm...it does not help to get excited. Keep tuned to your radio or television station for the latest tornado information. Do not call the Weather Bureau except to report a tornado.
* * * * * * * * * *
Revised
US Department of Commerce US Weather Bureau Chicago Illinois
Sunday April 11 1965
Chicago and vicinity forecast released 125PM CST Sunday April 11
Not to be used after 345 PM Sunday
This afternoon...cloudy and warmer. Chance of a few severe thunderstorms with local hail and damaging winds and possibility of a tornado in the area.
Tonight...showers ending. Cooler with low in lower 40s.
Monday...partly sunny and cooler. High in mid 50s.
Southerly winds 15 to 22 mph this afternoon becoming west to southwest 12 to 20 mph tonight and northwesterly 15 to 22 mph Monday.
Tuesday outlook...partly cloudy and warmer.

Safety rules for tornadoes include...
/1/ Take shelter in a storm cellar or other underground excavation whenever possible.
/2/ If underground protection is not available take shelter along inside walls or walls on the lower floors of a strongly reinforced building. In homes the southwest corners of basements usually offer greatest safety particularly in frame houses. People in houses without basements can sometimes be protected by taking cover under heavy furniture against inside walls.
/3/ In open country move at right angles to the approaching tornado. If there is no time to escape lie flat in the nearest ditch or depression.
End
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Chicago Weather Radar Summary
Sunday April 11 1965
120 PM CST
Radar shows widely scattered thunderstorms and showers over east central Iowa northern Illinois southern Wisconsin and southwestern lower Michigan. The heaviest thunderstorm which was reported to have a tornado associated with it in the last hour is located 5 miles south of Dubuque Iowa and is moving northeast at about 45 mph. Warnings have been issued for this tornado.
End
* * * * * * * * * *

Chicago Weather Radar Summary
Sunday April 11 1965
Time 215 PM CST
Weather radar shows scattered thunderstorms and showers in northern Illinois southern Wisconsin and southern lower Michigan. Heaviest showers are located 20 miles north and 20 miles east of Dubuque Iowa just west of Rockford and 10 miles northwest of Toledo Ohio. Showers are moving northeast at 35 to 40 miles per hour.
* * * * * * * * * *

Special Release
US Weather Bureau Chicago
Sunday April 11 1965
Time...305PM CST
The following received from Dubuque Iowa...
A radio station at Dubuque Iowa reports straight line winds blew down a barn 18 miles west northwest of Dubuque and two cars were damaged by falling trees. Wind gusts up to 62 miles an hour caused minor damage in Dubuque.
The following received from Moline Illinois...
Moline Illinois reported widespread wind damage in the metropolitan area. Mostly small buildings being blown down as well as numerous power and telephone wires down. Some downed wires caused several fires. And a large plate glass window was blown out.
End.

Special Release
US Weather Bureau Chicago
Sunday April 11 1965
Time... 320CST
The following from Milwaukee Wisconsin...
The Walwarth County Wisconsin Sheriffs Office reported a tornado touched down near Rockton Illinois about 15 miles north of Rockford about 3PM and was moving northeastward. Dixon Illinois about 40 miles southwest of Rockford reported wind gusts up to 81 miles an hour shortly after 3PM.
End
* * * * * * * * * *
Chicago Weather Bureau Radar
Sunday April 11 1965
315PM CST
Chicago Weather Bureau radar shows a line of thunderstorms from De Kalb Illinois which is 28 miles southeast of Rockford to 25 miles northeast of Madison Wisconsin. The line is about 35 miles wide and is moving northeast about 40 mph. Several funnel clouds and a tornado touching the ground have been reported with these storms.
* * * * * * * * * *
US Weather Bureau Madison Wis
Sunday April 11 1965
Time..320PM CST
State Patrol just called and said considerable damage at Monroe Wis.
No further information.
US Department of Commerce Weather Bureau forecast for Chicago and vicinity released 345 PM CST Sunday April 11 1965 not to be used after 945 PM CST Sunday.
Severe thunderstorms with local hail and damaging winds and possibility of a tornado in the area late this afternoon.
Tonight...showers ending and becoming partly cloudy and cooler.
Low in lower 40s.
Monday...partly sunny windy and cooler. High in the 50s.
Monday night...partly cloudy. Low near 40.
Southerly winds 30 mph and gusty to 50 mph or higher becoming southwesterly 25 to 35 mph tonight and westerly 20 to 30 mph Monday.
Tuesday...partly cloudy warmer.
* * * * * * * * * *
Emergency warning. Radio stations covering the areas affected are requested to use the emergency action notification signal as a preface to this warning.

US Weather Bureau Chicago Illinois April 11 1965
Tornado warning. A tornado was reported 2 miles north of Crystal Lake Illinois at 340 PM.
This tornado was moving in a northeasterly direction. Persons in McHenry and Lake counties in Illinois should take safety precautions during the next 30 to 60 minutes.

Safety rules for tornadoes include...
/1/ Take shelter in a storm cellar or other underground excavation whenever possible.
/2/ If underground protection is not available take shelter along inside walls or walls on the lower floors of a strongly reinforced building. In homes the southwest corners of basements usually offer greatest safety particularly in frame houses. People in houses without basements can sometimes be protected by taking cover under heavy furniture against inside walls.
/3/ In open country move at right angles to the approaching tornado. If there is no time to escape lie flat in the nearest ditch or depression.
End
* * * * * * * * * *

US Weather Bureau Springfield Illinois
Sunday April 11 1965
All clear bulletin west-central Illinois
The threat from severe thunderstorms and tornadoes has passed for locations in west-central Illinois. However winds will continue gusty and stronger than usual during the afternoon and tonight.
* * * * * * * * * *

US Weather Bureau Milwaukee Wisconsin
Sunday April 11 1965
Time...4PM CST
Coop observer at Occomowac Wisc 30 NW MKE# 330PM to 345PM CST
Severe wind damage. Winds estimated 60 to 70 Kts. Trees snapped off garage blown off foundation. Numerous other damage. Heavy rains no hail did not see funnel.
End
* * * * * * * * * *

Emergency warning. Radio stations covering the areas affected are requested to use the emergency action notification signal as a preface to this warning.

US Weather Bureau Chicago Illinois Sunday April 11 1965
Tornado warning. A tornado was reported 5 miles east of St Charles Illinois at 4.00 PM CST.
This tornado is moving in a northeast direction. Persons in northern Cook...Du Page...and Lake counties and in the vicinity of these areas should take safety precautions during the next 30 to 60 minutes.

The following tornado forecast is being issued simultaneously by various Weather Bureau offices.
Released 4.35 PM CST Sunday April 11 1965
U.S. Weather Bureau tornado forecast for
portions of northern Indiana
portions of southern Michigan and
portions of northwest Ohio

MKE - Milwaukee, Wisconsin

Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 10 miles northwest of Lafayette Indiana to Detroit Michigan from the present time til 8PM CST this Sunday evening. Tornado forecast number 66 is cancelled. Number 66 covered portions of northeast and east central Missouri...central portions of Illinois...and northwest and west central Indiana.

Revised Indiana
Scattered showers and thunderstorms tonight with locally severe thunderstorms with change of hail damaging winds and a tornado or two over north portion early tonight. Thunderstorms ending and turning cooler late tonight. Partly cloudy and cooler Monday and Monday night. West to southwest winds 20 to 30 mph Monday. Low tonight in the 40s northwest to 55 to 60 southeast.
* * * * * * * * * *
Special Release
US Weather Bureau Chicago
Sunday April 11 1965
Time... 5PM CST
The following received from Kankakee Illinois...
Several Building damaged. Lines down...debris on the road. Straight line wind not a tornado. 1½ miles north of Bouronnais on route 102 at 4PM CST. Bouronnais is located 30 miles south of Chicago.
* * * * * * * * * *
US Weather Bureau Milwaukee
Sunday April 11 1965
Public reports tornado touched down 4 miles west of Tomah Wisc 40 east northeast of Lacrosse 2215C
Demolished barn and silo
End
* * * * * * * * * *
The following all clear is being issued simultaneously by various Weather Bureau offices
Released 510 PM CST Sunday April 11 1965
All clear bulletin for northeast Illinois and southeast Wisconsin. Severe thunderstorms and tornado activity has now ended in northeastern Illinois and southeast Wisconsin. Winds will continue strong and gusty tonight.

This includes the Chicago Metropolitan area.

All clear statement
US Weather Bureau Chicago
Sunday April 11 1965
Time... 5.05 PM CST...
The tornado that was last reported 5 miles southwest of Volo Ill at 3.45 PM CST passed out of the area and is no longer considered dangerous. People in the vicinity of Du Page...Lake and North Cook County can resume

normal activities.
* * * * * * * * * * *
Special bulletin from Milwaukee Weather Bureau 5PM Sunday April 11 1965
The danger of severe thunderstorms with possible tornadoes in southern Wisconsin is now over. There may still be a few showers in the area but no more dangerous storms are expected.
* * * * * * * * * * *
Special release
Sunday April 11 1965
Wind damage reports from Chicago Police Department
Roof blown off building at 1340 South Talman. Two children injured.
Sign blown down at Ogden and Ashland Avenues. Two children injured and one child dead.
* * * * * * * * * * *
US Weather Bureau Madison Wis
Sunday April 11 1965
Just flew over part of one tornado track from 10 SW of Monroe to Evansville distance of about 40 miles. Did not check ends of track. Skipped town of Albany otherwise destruction is complete along track. Moved thru northwest side of Monroe including trailer court. Farmsites along track range from partially to total destruction. Large daily farmland area. Damage total will be heavy. Some sites of 10 buildings are leveled. Path rather narrow usually only one farm site affected would judge one half mile. No list of injuries as yet.
* * * * * * * * * * *
Special Weather Release
US Weather Bureau Chicago
Sunday April 11 1965
Time... 5.30 PM CST
From OHare International Airport
Wind damage report
Peak gust from Southwest 69 miles an hour at 4.34 PM CST. Blew in one section of hanger door at Butler Aviation...tore off about 10 feet of roofing from passenger wind A...turned 3 KC-97 tankers 90 Deg...few electrical failures...large curtain window blown out in terminal bldg.
No report of injuries.
* * * * * * * * * * *
Additional report from Chicago Police Dept 520 PM April 11
Building collapsed at Arcade and Wood Streets. Injured taken to hospital.
* * * * * * * * * * *
Special Weather Release
US Weather Bureau Chicago
Sunday April 11 1965
Time... 6PM CST...
Argonne National Laboratories reports southwest wind gust to 72 mph at the 150 foot level and 56 mph at the 38 foot level at 4.30 PM CST.

US Weather Bureau Lansing Mich
Sunday April 11 1965
Michigan State Police Paw Paw Post report that a tornado was reported at a trailer park between Goshen Indiana and Elkhart Indiana on US 33 about 3 miles south of the Michigan line at 6.30 PM EST. No further confirmation forthcoming.
* * * * * * * * * *

Special Release
US Weather Bureau Chicago
Sunday April 11 1965
Time...6PM CST
State Police report indicates tornado did heaviest damage along a line from Crystal Lake Illinois to Island Lake Illinois...roughly paralleling route 176. Path is approximately 5 to 8 miles long. First reports from police indicate 2 to 5 killed many injured.
End
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US Weather Bureau Indianapolis
Sunday April 11 1965
State Police reports tornado touched down near Koontz Lake about 20 miles southwest of South Bend. Several sightings in Stark St. Joseph and Marshall counties. Damage near Koontz Lake power lines down. Power lines and debris blocking roads. Injuries reported near Koontz Lake area. Second report by police with tornado touching ground in Elkhart County with position near corner of state road 119 and county road 117. Power lines out. Unable to contact area for extensive report at present.
* * * * * * * * * *

The following tornado forecast is being issued simultaneously by various Weather Bureau offices.
Released 6PM CST April 11 1965
US Weather Bureau tornado forecast for
portions of central Michigan
Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 20 miles wouth of Muskegon Michigan to 60 miles east of Gladwin Michigan from the present time til 8 PM CST this Sunday evening...
End
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US Weather Bureau Milwaukee
Sunday April 11 1965
Further information on tornadoes in southern Wisconsin
Wisconsins Governor Knowles has declared a disaster area in Gree...Rock... and Jefferson counties. And has advised caution in travel. Highway 30 is closed between Lake Mills and Johnson Creek.

Occonomowoc reports trees across Milwaukee road tracks 3 miles west of Ixonia. Police stopped train with flares and averted accident.

Waukesha County sheriff reports 3 miles south of Eagle that Wisconsin Highway 67 is closed to all traffic between Eagle and Little Prairie.
* * * * * * * * * * *

The following tornado forecast is being issued simultaneously by various Weather Bureau offices.
Released 710 PM CST April 11 1965
US Weather Bureau tornado forecast for
portions of Indiana
The northwest portion of Ohio and portions of southeast Michigan
Scattered severe thunderstorms with a few tornadoes large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 60 miles southwest of Indianapolis Indiana to 20 miles south of Detroit Mich from 8 PM to midnight CST this Sunday evening...
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US Weather Bureau Moline Illinois
Sunday April 11 1965
Watertown Wis confirmed tornado 3 miles east of town picked up autos and threw into trees. 3 persons dead. 23 injured to local hospital and others to nearby towns. .88 of an inch of rain in 15 min. 3/4 hail 3.2 PM covered ground north of town.

Shirland Ill
2 barns leveled 3 1/2 miles south at 2.45 PM CST to 2.50 PM small hail 2.35 PM precipitation .79 of an inch
Wind damage to farm 35 miles northeast of Fayette at about 1.50 PM
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US Dept of Commerce Weather Bureau Lansing Mich April 11 1965
The threat of tornadoes is now ended in the following counties in central Michigan. Ingham Eaton Shiawassee Clinton Isabella Gratiot.
* * * * * * * * * * *

Chicago Weather Radar Summary Sun 4/11/65 815PM CST
The Chicago Weather Radar shows that a line of thunderstorms that passed through the Chicago area this afternoon now lies from Terre Haute Ind Newd to Indianapolis...Toledo and Detroit. The S end of the line is moving Swd around 15 mph while the north end of the line is moving E at around 50 mph.
* * * * * * * * * * *

US Weather Bureau Lansing Mich
Sunday April 11 1965
Wind storm damage reported 6 miles north of Lansing by Civil Defense Director. Storm occurred at about 8.15 PM CST one person critically injured one house completely demolished and two houses severely damaged... one house still on fire.
* * * * * * * * * * *

US Weather Bureau Detroit Michigan ... 10PM EST April 11 1965
The threat of severe thunderstorms and possible tornadoes has now ended in southeast lower Michigan. Scattered thunderstorms will continue in the area for about another hour.

Special Weather statement from US Weather Bureau Detroit
10PM EST Sunday April 11 1965
The squall line that passed through the Detroit area at approximately 9PM this evening produced locally severe thunderstorms with hail and high winds in the greater detroit area. Maximum wind gusts of 43 mph were reported at Detroit City Airport while at Metropolitan Airport wind gusts to 45 mph were observed. Extremely heavy precipitation was observed with the heavy thunderstorms with amounts in excess of one inch in less than a half hour in the Detroit Metropolitan Airport area with half inch hailstones reported at Ypsilanti. Hail was also reported in the Detroit area at the foot of Livernois in the Fort Wayne vicinity. Spotty damage reports have been received including one of a barn being blown off its foundation in a southwestern suburb.
With the passage of the squall line to the east of the Detroit area the threat of severe thunderstorms and possible tornadoes has now ended for the night.
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Chicago Weather Radar Summary Sun 4/11/65 915PM CST
The Chicago Weather radar shows a band of thundershowers about 35 miles wide running from 40 miles N of Evansville Ind through Indianapolis to Toledo Ohio. The line is moving SE at 30 to 40 mph. The radar also indicates some light rain showers in extreme Srn Wis just N of the Ill Wis state line from about 35 miles NW of Rockford to Lake Mich. These showers have moved E at about 45 mph.
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US Weather Bureau Madison Wis
Sunday April 11 1965
Latest reports from Monroe Wis say 95 injured and received treatment. No deaths. Believe all accounted for.
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US Weather Bureau Grand Rapids Mich
Sunday April 11 1965
Many tornadoes reported. Most damage was at Comstock Park and other areas just to Northwest of Grand Rapids and at Burnips 20 miles southwest of Grand Rapids.
Present available information is that 6 to 8 people were killed and approximately 200 hospitalized.
* * * * * * * * * *
The following tornado forecast is being issued simultaneously by various Weather Bureau offices.
Released 1030 PM CST April 11 1965
US Weather Bureau tornado forecast for
portions of extreme east central Indiana
most of Ohio
portions of western Pennsylvania and
a small portion of extreme southwestern New York and
the panhandle of West Virginia.

Scattered severe thunderstorms with a few tornadoes large hail and

locally damaging wind storms are expected in an area along and 60 miles either side of a line from 40 miles southwest of Dayton Ohio to 30 miles southeast of Bradford Pennsylvania from Midnight to 6 AM CST this Monday morning.

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The following all clear is being issued simultaneously by various Weather Bureau offices.

Released 243AM CST Monday April 12th 1965

US Weather Bureau cancellation of tornado forecast for portions of extreme east central Indiana
most of Ohio
portions of western Pennsylvania
extreme southwestern New York
panhandle of West Virginia

Cancel the forecast issued late last night for above area. Activity has moved eastward and southward.

End.

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The following all clear is being issued simultaneously by various Weather Bureau offices

Released 625AM CST Monday April 12th 1965

US Weather Bureau cancellation of severe thunderstorm forecast for portions of eastern Pennsylvania
portions of Maryland
extreme eastern West Virginia

The severe thunderstorm forecast issued earlier this morning is now cancelled. Activity has decreased in intensity.

SUMMARY OF TORNADO PATHS IN NORTHEAST ILLINOIS-APRIL 11, 1965
From a Report by C. Feris, J. Vermoch and H. Yario-USWB Chicago

Crystal Lake-Island Lake Tornado This tornado first touched down 2 1/2 miles southwest of downtown Crystal Lake at 3:27 PM. As the tornado moved on towards Nash Road and McHenry Ave the path began to widen and the funnel then moved across an open field skirting South Jr. H.S.. Upon crossing highway 14 at 3:29 the tornado inflicted severe damage at the Lake Plaza Shopping Center. The center then moved over the heavily populated Colby's Home Estates. The width of the storm through this area was 1000 to 1300 feet, the widest in this tornado's life cycle. Damage was extensive, many homes were completely raked from their foundations. At least 45 houses were destroyed and 110 more badly damaged in this one subdivision. The storm then passed over a half a mile of open fields, skirting a large research plant. Passing the C&N railroad tracks, damage was done to a Diesel plant and Wallpaper plant. At 3:32 the storm crossed Crystal Lake Ave and evidence suggests an uplifting of the funnel and consequent narrowing of the path to 300 to 500 feet. About 1 and 1/4 miles west of Fox River the tornado became violent once again, trees were snapped off along a path 500 to 800 feet wide. Even though the tornado moved down a steep hillside, hardly a tree was left standing. The funnel crossed the Fox river causing extensive damage on the west side but little on the east side, probably because of the water's effect. After passing over an unpopulated area along a marshaland the tornado caused severe damage to Island lake along the western shore. The storm held its intensity across this body of water and did extensive damage to the eastern shores. After passing over a heavily wooded area on the east side of Island Lake the storm quickly weakened and finally lifted before reaching highway 12.

Druce Lake-Gurnee Tornado

This tornado began over Druce Lake at 3:50 PM CST. The funnel formed into a waterspout over the lake and ripped through a subdivision on the northeast shore. After crossing U.S. 45 it passed over two miles of unpopulated woods and marshes. The storm cut a swath though an orchard, crossed Cemetery Road and then crossed Interstate 94. At least 12 homes were seriously damaged in the McGaughy and Lodesky subdivisions south of Illinois Route 132. After crossing Illinois 63 the storm lifted east of the Des Plaines River. Damage from this storm was different than the Crystal Lake storm. The path was much narrower and more constant in its width of 400 to 600 feet.

Geneva Tornado

at 4:00 PM a funnel cloud was sighted 5 miles east of St. Charles. The vortex was only 300 to 500 feet wide at its contact zone with the ground. It first touched down hust outside the city limits and moved northeastward across U.S. 30. At least 12 homes were severely damaged. The tornado lifted after .3 miles on the ground.

Zion-Waukegan Tornado
This tornado touched down at 4:04 and damaged two homes, it was 800' wide.

MADISON, WISCONSIN

Local Statements:

Issued at 2:15 P.M. CST. Radar shows a strong thunderstorm cell just southwest of Madison moving in our direction. Be on the alert for heavy thunderstorms, possible hail and heavy damaging wind within the next half to one hour in the Madison area. The previous severe weather forecast is still in effect and still includes the Madison area.

* * * * * * * * * *

Issued at 3:15 P.M. EST. Line of heavy thunderstorms extending from Tomah to just north of Madison and south to Williams Bay is moving northeastward at 40 to 45 miles an hour. All areas near and ahead of the path of this line should be on the alert for severe weather as described in severe weather forecast #68. (SELS forecast #68 was then repeated).

Issued at 3:50 P.M. EST. All clear issued for Madison area.

Warning Actions Taken.

1. Phoned SELS forecast # 68 to Wisconsin State Patrol at 1:20
2. Transmitted SELS forecast # 68 to local radio and television stations between 1:45 and 1:55 P.M.
3. Issued warning at 2:15 P.M.
4. Issued updated warning of thunderstorm in Madison area and repeated SELS forecast #68 for Wisconsin area.
5. Issued warning at 3:15 P.M.
6. Issued all clear at 3:50 P.M. EST.

ALSYM A MKCC 112228

SEVERE WEATHER FORECAST NUMBER 69

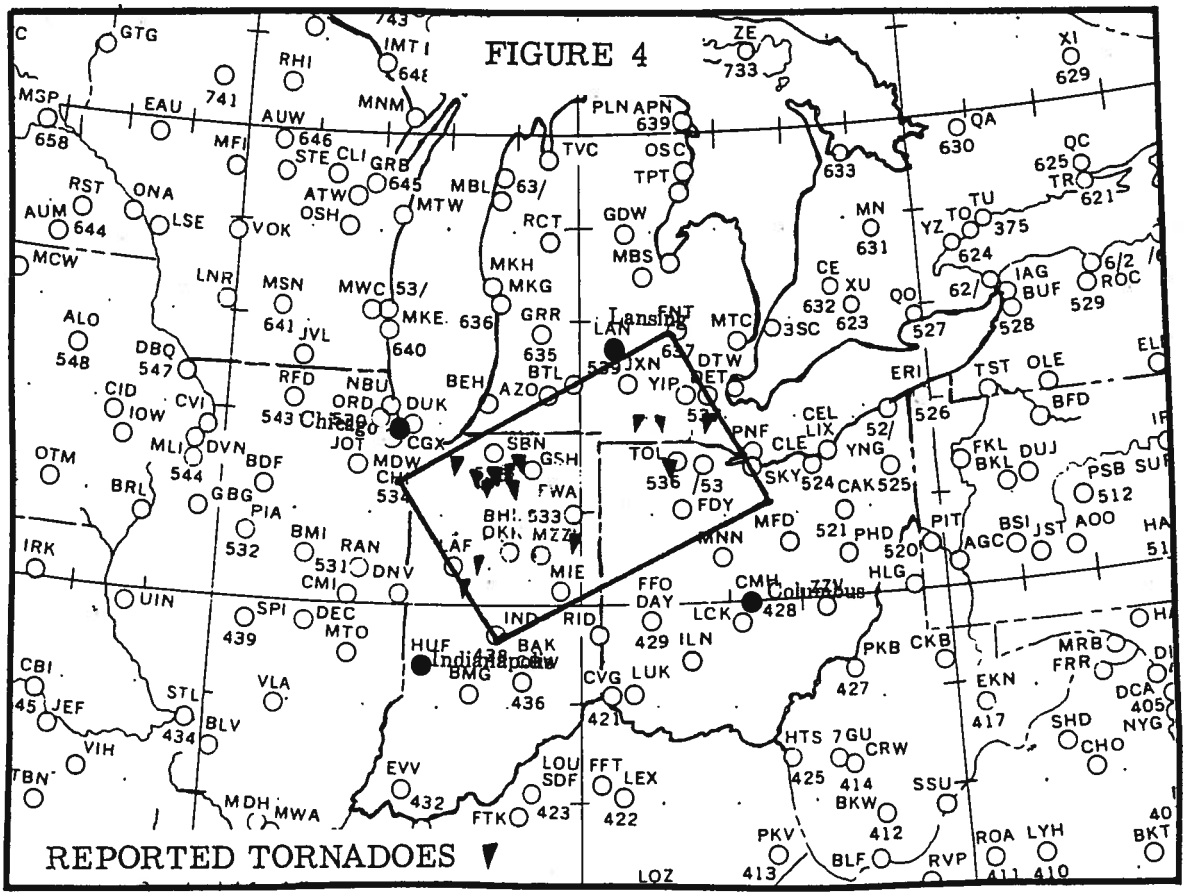
ISSUED 420 PM CST APRIL 11 1965

U.S. WEATHER BUREAU TORNADO FORECAST FOR....

PORTIONS OF NORTHERN INDIANA
PORTIONS OF SOUTHERN MICHIGAN AND
PORTIONS OF NORTHWEST OHIO

SCATTERED SEVERE THUNDERSTORMS WITH A TORNADO OR TWO LARGE HAIL AND LOCALLY DAMAGING WIND STORMS ARE EXPECTED IN AN AREA ALONG AND 60 MILES EITHER SIDE OF A LINE FROM 10 MILES NORTHWEST OF LAFAYETTE INDIANA TO DETROIT MICHIGAN FROM THE PRESENT TIME TIL 8 PM CST THIS SUNDAY EVENING. TORNADO FORECAST NUMBER 66 IS CANCELLED.

CRUMRINE....2230Z



Local Statements:

Issued at 1 PM EST.
Cloudy and warmer with occasional showers and thunderstorms this afternoon and evening. Storms locally severe with large hail damaging wind and chance of tornado late this afternoon and evening. Partly cloudy and cooler late tonight and Monday. High today in middle 70s. Low tonight around 50. High Monday in middle 60s.

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Issued at 1:45 PM EST.
Zone 1 -
Mostly cloudy and warmer with occasional showers and thunderstorms this afternoon. Storms locally severe in the southwest half of zone. Storms may be locally severe with large hail damaging wind and chance of tornado in late afternoon and evening. Showers ending and turning colder tonight. Partly cloudy and colder Monday. High today near 70. Low tonight in the 40s. High Monday 55 to 63.

Zone 3 -
Cloudy and warmer with occasional showers and thunderstorms this afternoon and evening. Storms locally severe with large hail damaging wind and chance of tornado late this afternoon and evening. Partly cloudy and cooler late tonight and Monday. High today in middle 70s. Low tonight around 50. High Monday in middle 60s.

Zone 4 -
Area west of not including Kokomo and Shelbyville...includes Indianapolis and vicinity. Cloudy and warmer with occasional showers and thunderstorms this afternoon and evening. Storms locally severe with large hail damaging wind and chance of tornado late this afternoon and evening. Partly cloudy and cooler late tonight and Monday. High today in middle 70s. Low tonight around 50. High Monday in middle 60s.

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Issued at 2:56 PM EST.
There are no showers or thunderstorm echoes within range of weather radar at this station. None within 100 miles or more.

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Issued at 4:15 PM EST.
Strong southwesterly wind flow in very warm humid air in advance of a cold front moving through Illinois is producing wind gusts to fifty knots in that area. Surface winds over Indiana will steadily increase during the late afternoon and evening from the southwest with surface gusts reaching 40 knots or higher. These will not be associated with thunderstorms but will be straight wind gusts associated with the wind field. No thunderstorms are in progress at the present time over Indiana and central and southern Illinois as shown by latest reports of surface or radar observations. Thunderstorms are occurring over northwestern Illinois eastern Iowa and southern Wisconsin at the present time.
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INDIANAPOLIS (Continued)

Local Statements:

Issued at 5:30 PM EST.
Scattered showers and thunderstorms tonight with locally severe thunderstorms with chance of hail damaging winds and a tornado or two over west portion early tonight. Thunderstorms ending and turning cooler late tonight. Partly cloudy and cooler Monday and Monday night. West to southwest winds 20 to 30 mph Monday. Low tonight in the 40s. Northwest to 55 to 60 southeast.

Zones 1 and 2 -
Scattered showers and thundershowers tonight with locally severe thunderstorms. Chance of hail damaging winds and a tornado or two early tonight. Thunderstorms ending and turning cooler late tonight. Partly cloudy and cooler Monday and Monday night. Low tonight 40s. High Monday 60s.

Zones 3, 4 and 5 - Same as Indianapolis and vicinity. Partly cloudy this evening with a few scattered showers or thundershowers ending and becoming cooler tonight. Partly cloudy and cooler Monday and Monday night. Low tonight mid 50s. High Monday 70s.

Zones 6 and 7 - Scattered showers and thundershowers tonight. Thunderstorms ending and turning cooler late tonight. Partly cloudy and cooler Monday. Low tonight 55 to 60. High Monday 70s.

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Issued at 7:00 PM EST.
Indianapolis radar at 7 PM shows moderate to weak echoes located northwest 60 miles southeast 60 miles and west northwest 85 miles. All apparently moving northeastward 40 to 50 miles per hour.

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Issued at 7:05 PM EST.
Reference tornado reported at LaPaz Indiana State Police report fatalities but the number unknown at present. Also at Wyatt injuries but none reported fatal at present. Will send later infor when received from State Police Units in the area.

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Issued at 7:15 PM EST.
Public reports funnel cloud near O'Dell Illinois. Damage and injuries if any unknown. Egg sized hail over Lafayette possible tornado in this activity. Storms are moving northeast.

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INDIANAPOLIS (Continued)

Local Statements:

Issued at 7:20 PM EST.
Tornado Alert for the following counties...Tippecanoe..Clinton..Carroll..
Howard..Cass..and Miami..for the next 1 to 2 hours.

Public sighted a funnel cloud at O'Dell Illinois moving northeast and public reported egg size hail at Lafayette. The Civil Defense reported a tornado touching down 4 to 6 miles south of Lafayette at about 7.10 PM. The thunderstorm activity presently in the Lafayette area will move northeastward 30 to 40 mph and residents of the above counties should take precautionary measures.

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Issued at 7:25 PM EST.
Zones 1 2 and 3 .. Revise north and central portions of Zones 1 2 and 3 ..
Precautionary measures should be taken in these areas. Severe thunderstorm activity with possible tornado or two during the next two hours.

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Issued at 7:34 PM EST.
Funnel clouds reported near Rossville Indiana by Town Marshall. Funnel clouds west of Middlefork Indiana and also west of Frankfort. Both these reports by the State Police.

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Issued at 7:45 PM EST.
Three thunderstorm cells are now located on the Indianapolis radar at the present time with tops to 45 thousand feet and moving east northeast about 50 mph. The position of the cells..15 miles southwest of Lebanon...18 miles southeast of Lafayette..and 10 miles northeast of Tipton.

Add the following counties to the Tornado Alert...Boone..Tipton..and North Hamilton..and Eastern Montgomery. Additional statements will be issued as needed.

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Issued at 7:49 PM EST.
State Police have a car enroute to Moran in Clinton County where a school and 3 houses were reported destroyed. Additional information will be sent as received.

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Issued at 8:00 PM EST.
Zones 3 4 and 5. Revise North and central sections of Zones 3 4 and 5 should take precautionary measures for possible tornado activity during the next 2 hours.

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INDIANAPOLIS (Continued)

Local Statements:

Issued at 8:13 PM EST.
Add the following counties to the Tornado Warning...Remainder Hamilton.. Madison..Delaware..and North Randolph.

The present thunderstorms and possible tornadoes on the Indianapolis radar are located 10 miles southeast of Crawfordsville..near Sheridan..10 miles southeast of Marion...these storms are moving quite rapidly east northeasterly about 50 mph.

Tornado Warnings still remain in effect for the previous counties listed.

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Issued at 8:17 PM EST.
Add the remainder of Montgomery County to the Tornado Warning area.

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Issued at 8:19 PM EST.
SELS Forecast #72 was released on the local circuit.

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Issued at 8:33 PM EST.
Add the following counties to the Tornado Warning area..Putnam..Hendricks.. Marion..Hancock..Rush..Henry..Fayette..Union..Wayne..and Remainder of Randolph.

The Indianapolis radar at the present time shows the thunderstorm line 15 miles south of Crawfordsville to Thorntown to 10 miles east of Frankfort to 5 miles south of Tipton to 10 miles west of Anderson. The thunderstorms have now formed into a line and are moving in a more easterly direction 40 to 50 mph.

Another tornado reported one half mile north of Dover in Boone County and some houses down in Greentown in Howard County. State Police have cars enroute to the scene.

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Issued at 8:40 PM EST.
Scattered showers and thunderstorms with a possibility of a tornado or two until midnight. Becoming partly cloudy and cooler by Monday. Low tonight mid 50s. High Monday upper 60s.

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Issued at 8:45 PM EST.
A tornado reported by the public to have touched down 25 to 35 miles north of Cicero Indiana..Cicero in Howard County.

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INDIANAPOLIS (Continued)

Local Statements:

Issued at 9:05 PM EST.
The Indianapolis Radar has a thunderstorm line from 10 miles southeast of Rockville...20 miles south of Crawfordsville...5 miles southeast of Lebanon... 18 east of Frankfort...5 miles southeast Tipton...to Alexandria.

Add the following counties to the Tornado Warning...Southern Parke..Northern Clay..Northern Owen..Morgan..Johson..and Shelby.

Clear the following counties...Miami..Cass..Carroll..Tippecanoe..Howard.. Clinton..and Northern Montgomery.

State Police reported a tornado touched down at 8:52 PM west of Sheridan in Hamilton County.

At 9:15 PM a summary of the counties alerted for Tornado Warnings will be run.

The present movement of the thunderstorm line indicated that it will be in the Indianapolis area within the next half hour.

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Issued at 9:10 PM EST.
Line of thunderstorms 25 miles west extending to northeast 40 miles. Cells moving along line 40 mph. Cell thunderstorm new WSW 50 miles moving east northeast at 40 mph. Area thunderstorms northeast 50 to 60 miles moving northeast 45 mph.

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Issued at 9:20 PM EST.
The Indianapolis Radar shows the present thunderstorm line near the following cities...Danville..Zionsville..Noblesville..Anderson..and Muncie.

Clear the following counties...Tipton..Northern Madison..Northern Boone.. Remainder Montgomery..Northern Putnam..and South Parke.

Add the following counties...Monroe..Remainder Owen..Greene..Eastern Sullivan ..Remainder Clay.

These counties are now in the Tornado Warning area due to a new thunderstorm line located 10 miles north Sullivan to 15 miles southeast of Brazil.

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INDIANAPOLIS (Continued)

Local Statements:

Issued at 10:12 PM EST.
The Indianapolis Radar at 10 PM has the thunderstorm line extending from Linton northeastward through Martinsville..just east of Indianapolis.. Fortville...just south of Muncie..to 10 miles south of Portland and moving eastward 40 mph.

The thunderstorm line is weakening and all counties previously in the tornado warning area are now cleared for tornado warnings.

However a tornado forecast still remains in effect until 1 AM for the area included in the following points..Goshen southwest to Lafayette to Terre Haute then southeast to Louisville then northeast to Cincinnati. This roughtly plots the area in Indiana.

This will be the last weather statement issued due to this series of storms unless further development occurs.

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Issued at 10:45 PM EST.
The Indianapolis radar has the line of thunderstorms now extending on a northeast-southwest line from Washington Indiana northeastward through Bloomington..Franklin..Shelbyville..Hagerstown..To Greenville Ohio moving eastward at 45 mph.

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Issued at 11:30 PM EST.
All of Indiana northwest of a line extending from Union City..to New Castle.. to Shelbyville..Bloomington..to Vincennes..are now cleared from the tornado forecast area. The portions of Indiana southeast of the above line are still affected by the tornado forecast until 1 AM.

SOUTH BEND, Indiana

Issued at 12:20 PM EST.
Severe thunderstorm and tornado forecast.
Scattered severe thunderstorms with large hail and damaging winds and several tornadoes are expected this Sunday afternoon and evening from 1 PM EST until 7 PM EST in an area 60 miles either side of a line from 60 miles west of St. Louis Missouri to 40 miles north of Indianapolis Indiana. This area includes portions of northeast and east central Missouri central Illinois northwest and west central Indiana.
In this area this includes Starke and southern Porter and Laporte Counties.

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Issued at 1:30 PM EST.
An instability or squall line is expected to develop early this afternoon from southern Iowa into central Missouri and continue to develop southward into central Arkansas during the afternoon. This line will move northeastward around 35 mph. If severe weather develops in this area it will be in the latter part of the forecast time period.
At present only scattered thundershowers are reported from Iowa to east of South Bend.

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Issued at 2:30 PM EST.
A severe weather forecast has been issued for an additional area. Scattered severe thunderstorms with large hail and damaging winds and several tornadoes are forecast for this Sunday afternoon and evening from 2 PM EST to 7 PM EST for portions of southern Wisconsin eastern Iowa and northern Illinois. The area is bounded by a line from 40 miles south of Burlington Iowa to 50 miles west of Lonerock Wisconsin to Milwaukee Wisconsin to 40 miles southsoutheast of Chicago Illinois back to 40 miles south of Burlington.
This does not affect the severe weather forecast area issued earlier which is still in effect.
Chicago based radar reports a tornado just east of Dubuque Iowa. This tornado was also sighted by unknown persons. No damage reports have been received.

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Issued at 3:30 PM EST.
Latest radar reports show
1. Area of scattered thundershowers from 20 miles southeast of Detroit to 20 miles westsouthwest of Jackson Michigan.
2. An area of scattered thundershowers increasing in intensity from 10 miles northnorthwest of Battle Creek Michigan to 50 miles northeast of Cedar Rapids Iowa.
3. A line of moderate to heavy thunderstorms increasing in intensity from 10 miles northwest of Moline Illinois to 30 miles south of Mason City Iowa.

A tornado was reported by a pilot 35 miles southwest of Martinsburg West Va.

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Issued at 4:30 PM EST.
Although some widely scattered thunderstorm and shower activity is occurring in northern Indiana and southern lower Michigan no significant thunderstorms have been reported in Indiana in the area of the severe weather forecast. Farther west a line of thunderstorms is developing near the Iowa Illinois border and is expected to move eastward at 40 TO 45 mph...possibly intensifying and elongating as it progresses. In this line some severe thunderstorms and possible tornadoes can occur. No severe weather has been reported in Illinois or Wisconsin as yet while a tornado was spotted earlier this afternoon in Iowa and about 32 miles northwest of Moline Illinois.

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Issued at 4:40 PM EST.
Line of thunderstorms mentioned in 4:30 PM EST statement has now become a definite squall line. This squall line now extends from 20 miles south of LaCrosse Wisconsin thru Madison Wisconsin thru Rockford Illinois to near Champaign Illinois and is moving east northeastward at about 40 to 45 mph. In this line scattered severe thunderstorms are likely and a few tornadoes are possible. Squall line is expected to reach southeastern and east central Wisconsin northeastern Illinois southern and central Lake Michigan and most of extreme northern Indiana and into west central and southwestern lower Michi Gan by about 8 PM EST. Indications are that the severe forecast area may be extended in time and eastward in area. Will advise if this situation materializes.

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Issued at 5:05 PM EST.
A tornado warning has been issued for McHenry and Lake County...both in Illinois. A tornado was reported 2 miles north of Crystal Lake Illinois at 440 PM EST moving northeastward.

A funnel cloud was reported about 5 miles westsouthwest of OHare Field.

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Issued at 5:20 PM EST.
The latest radar located position of the squall line is from Oshkosh Wisconsin to Milwaukee Wisconsin to Chicago Illinois to 30 miles northwest of Lafayette. The line is moving east northeastward at 40 to 45 mph.

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Issued at 5:30 PM EST.
Severe Weather Forecast
Severe thunderstorms with large hail and damaging winds and several tornadoes are forecast this Sunday evening April 11 1965 from 530 PM to 9 PM EST along and 60 miles either side of a line from Lafayette Indiana to Detroit Michigan. In this area this includes Porter Laporte St Joseph Elkhart Starke Marshall and Koscuisko Counties.

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SOUTH BEND (Continued)

Issued at 5:43 PM EST.
Severe thunderstorm and tornado warning.
Radio and television stations are requested to use emergency frequencies.
Radar indicates some very strong storm echoes in the vicinity of Michigan City Indiana and in an area just west of Knox Indiana. In these areas a tornado may touch the ground. Residents in the counties of LaPorte Starke and Marshall should be on the alert for possible tornadoes and severe thunderstorms for the next 30 to 60 minutes and to take appropriate safety precautions.
If a storm is observed in these areas that is considered severe promptly notify the Weather Bureau at South Bend Indiana.

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Issued at 5:45 PM EST.
Correction...
Also echoes show that storms are moving east northeast about 45 mph.

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Issued at 5:50 PM EST.
Severe Weather Forecast
Windy with showers and thunderstorms tonight. Scattered severe thunderstorms with large hail and damaging winds and a chance of a tornado or two early tonight. Thunderstorms ending and turning cooler late tonight. Partly cloudy and cooler Monday and Monday night. West to southwest winds 20 to 30 mph. Chance of wind gusts to 75 mph in severe thunderstorms early tonight. Low temp tonight mid 40s. High Monday mid 50s. Low Monday night 40.

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Issued at 6:00 PM EST.
Radio and TV stations are requested to use Emergency Warning Signal.
Confirmed tornadoes have been reported just north of Plymouth and from Marshall to Argos Indiana. This last one was seen in the vicinity of Donaldson Indiana just east of Hamlet on US 30 moving in a east northeast direction.
Persons in St Joseph Marshall Elkhart and Kosciusko Counties in the path of these storms should take emergency precautions during the next 30 to 60 minutes.

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Issued at 6:23 PM EST.
Another tornado was sighted 15 to 20 miles west of Plymouth Indiana. This tornado is moving east northeastward. Also another confirmed tornado 4 miles west and 5 miles north of Nappannee Indiana. Extend and continue tornado warnings to Marshall St. Joseph and Marshall Counties for the next 30 to 60 minutes.
Persons in these counties should take all precautions to ensure their safety.

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SOUTH BEND (Continued)

Issued at 6:24 PM EST.
Another tornado was sighted south of Southbend at Miami Road and Quinn Road moving toward Bremen Indiana. Damage to barns and homes were reported. This tornado is also near or in the vicinity of Lakeville Indiana. Please warn residents of Bremen Lakeville LaPaz in the path of this tornado to take immediate safety precautions.

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Issued at 6:28 PM EST.
All Radio and TV stations please use emergency warning on all notices.
A tornado has been sighted near Hebron Indiana moving eastward at 40 mph. All persons in Porter and Starke Counties are to take emergency precautions during the next 30 to 60 minutes.

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Issued at 6:35 PM EST.
A tornado has been sighted at 632 PM CDT 3 miles west of Goshen Indiana moving east northeast. Take emergency precautions during the next 30 to 60 minutes.

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Issued at 6:37 PM EST.
Two tornadoes have been sighted 3 miles south of Union Indiana or about 18 miles south of LaPorte Indiana. These tornadoes are moving east to east northeastward about 30 to 35 mph. All persons in LaPorte and St. Joseph County should be warned to take all precautions during the next 30 to 90 minutes.

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Issued at 6:42 PM EST.
Tornado 2 miles south of Kingsford Heights moving in northeast direction sighted at 640 PM CDT all in area of Mill Creek be on the Lookout for next 30 to 60 minutes.

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Issued at 6:46 PM EST.
Emergency precautions should be taken in the area of Lydick Indiana. Area tornadoes have been reported to the southwest moving in northeast direction all precautions should be taken.

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Issued at 6:50 PM EST.
Reports of tornadoes and funnel clouds have become so numerous that it is impossible to keep track of them. Warnings should therefore exist throughout the northern central portion of Indiana. The problems have been intensified by telephones being out in many areas and it is impossible to notify many people.

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SOUTH BEND (Continued)

Issued at 7:10 PM EST.
A tornado is just west of Bremen Indiana moving toward Bremen. Radio and TV stations are requested to use emergency warning devices as Bremen cannot be contacted by phone.

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Issued at 7:13 PM EST.
Broadcasting stations are urged to ask people not to call the Weather Bureau unless they have weather to report. We have had numerous poor joke calls and they tie up the lines.

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Issued at 7:33 PM EST.
Partial all clear statement.
The squall line now lies from 45 miles north of Terre Haute to Kalamozoo Battle Creek area to 55 miles west of Saginaw Michigan. In this area this lies through Mishawaka Walkerton Culver. The threat of severe thunderstorms and tornadoes is now over for areas to the west of this line.

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Issued at 8:10 PM EST.
Partly cloudy and cooler tonight and Monday and Monday night. West to northwest winds 15 to 30 mph with occasional higher gusts diminishing to 10 to 20 mph late tonight. Low temp tonight mid 40s. High Monday mid 50s. Low Monday night 40.

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Issued at 8:30 PM EST.
All Clear Statement.
The squall line is now from Angola to Kandallville to Peru to Crawsfordsville Indiana. Therefore the threat of severe thunderstorms and tornadoes is now over for northern Indiana except for the extreme northeast portion of northern Indiana.

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FORT WAYNE, INDIANA

Issued at 2:30 PM EST.
Severe Weather Forecast Number 69
US Weather Bureau Tornado Forecast for...
Extreme Southern Wisconsin
Extreme Eastern Iowa
Portions of Northern Illinois
A few severe thunderstorms with large hail damaging winds and one or two tornadoes are expected from 1 PM until 6 PM CST this Sunday afternoon and evening in the area bounded by the points 40 miles south of Burlington Iowa to 50 miles west of Lone Rock Wisconsin to Milwaukee Wisconsin to 40 miles south east of Chicago Illinois back to the point 40 miles south of Burlington Iowa.

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Issued at 6:08 PM EST.
Along and 60 miles either side of a line 10 miles north of Lafayette Indiana to Detroit Michigan scattered severe thunderstorms with a tornado or two and hail 1 to $1\frac{1}{2}$ inches in diameter and surface winds with gusts to 75 knots from current time until 9 PM EST Sunday April 11 1965.
This includes all the counties in northeastern Indiana LaGrange Steuben Nobile Dekalb Whitley Allen Wabash Huntington Wells Adams Grant Blackford and Jay counties.
At the present time the radar at US Weather Bureau at Baer Field indicated that there are not severe thunderstorms in the area.
Further information will be issued as necessary.
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Issued at 7:10 PM EST.
Three tornadoes have been confirmed northwest of Fort Wayne..one at or near Plymouth Indiana..one at or east of Plymouth Indiana and one at Nappanee and Lapaz Indiana.
The radar at the present time 7:10 PM EST indicates a moderate to severe thunderstorm in northern Steuben and another in northern LaGrange Counties about 45 miles north of Fort Wayne. Also two light thundershowers about 50 miles west of Fort Wayne and another 75 miles west southwest of Fort Wayne. They are all moving toward the east northeast.

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Issued at 7:35 PM EST.
Funnel clouds have been sighted at Odell Indiana moving northeast and a tornado touched down four to six miles south of Lafayette at about 7:10 PM.
At 7:33 PM funnel clouds reported near Rossville Middlefork and West of Frankfort.

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Issued at 7:40 PM EST.
Radar at Baer Field shows a bright echo between South Whitley and Columbia City Indiana which has been identified as the storm containing definite tornadoes which caused some fatalities at Lapaz Indiana. Residents in that area should be considered as being in a tornado alert area and take immediate precautions if any funnel clouds appear.

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Issued at 8:10 PM EST.
Add to definite tornado alert to the areas already under this warning the following...
Grant Blackford Jay and Southern Wabash Huntington Wells and Adams Counties.
Tornadoes have been sighted in Clinton County and are moving in the general direction of the counties listed.

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Issued at 8:40 PM EST.
The Weather Bureau radar at Baer Field shows a strong hook echo about 5 miles west of Berne Indiana and moving eastward. Residents in the Berne area should take immediate precautions for personal safety for a strong possibility of a tornado for the next 30 to 60 minutes.

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Issued at 9:00 PM EST.
The Weather Bureau radar at Baer Field shows the strong hook echo now just a mile or two south of Van Mert and weakening in intensity. Hold the line a minute for a definite report on tornado at Berne. The tornado touched down at Berne three miles west and one mile northeast..several houses destroyed and ambulances are rushing to scene.
Tornado hit between ten and fifteen minutes ago which would be between 8:50 and 8:55 PM EST.

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Issued at 9:20 PM EST.
Attention WOMO Please use emergency action notification signal.
Marion Indiana reported through the Fort Wayne signal department at 9.07 PM EST that three tornadoes had struck the city of Marion with extensive damage. The Verterans Administration Hospital was one area hit. Request for ambulance assistance has been requested from Muncie and Anderson.
The Fort Wayne Weather Bureau places these counties under alert for eastward movement that struck Marion. These counties are Wells Adams Blackford and Jay Counties. Residents in these counties should remain on the alert for the next 60 minutes.

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FORT WAYNE (Continued)

No issuances between 9:30 PM EST and 10:30 PM EST due to power failure.

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Issued at 10:45 PM EST.
The weather has improved at Fort Wayne and northeastern Indiana and is now no longer in a severe weather area. This is considered to be an all clear statement for all severe weather. An investigation is underway at Van Wert Ohio of a severe weather occurrence.
A tornado was reported in Van Wert Ohio at 9:15 PM this evening and caused considerable damage. This report courtesy Fort Wayne Police Department.
All radio and television stations please broadcast this all clear statement as soon as feasible.

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SUMMARY OF TORNADO PATH ACROSS GRANT, BLACKFORD, WELLS AND ADAMS COUNTIES
Based on a report by Mr. Clyde H. Downes, MIC of Ft. Wayne, Ind.

The tornado left Howard county and entered Grant county at 7:50 PM. Path of damage was about 1/2 mile wide across rural area. Near the south edge of Marion two tornado funnels were reported near 8 o'clock. One of the tornadoes was large and did most of the damage, the second was reported as having left a short track about a mile south of the main path.

The tornado toppled 31 Indiana and Michigan Electric company transmission towers as it entered the south portion of the Marion area. The tornado continued eastward across the south edge of the U.S. Veteran's hospital on the southeast edge of Marion, where once again two funnels were reported. The clock at the hospital stopped at 8:10 PM.

After leaving Marion the tornado continued east northeastward and passed through the south part of Arcana and on to the north edge of Keystone at approximately 8:30 PM. It continued along the same path passing one mile north of Petroleum and then directly over Linn Grove at 8:40 PM. Damage in Linn Grove was extensive, once again at least two tornadoes were visible. Continuing on the same path the tornado passed over the north edge of Berne where damage was created by at least two tornadoes. The storm crossed into Ohio near 8:52 PM. The forward speed of movement of the parent thunderstorm was approximately 57 miles an hour.

SUMMARY OF TORNADO PATH ACROSS LAGRANGE AND STUEBEN COUNTIES

A tornado cloud with two tornadoes was observed at the west edge of LaGrange county, the two funnels then merged. The time of observation is uncertain. The tornado continued east northeastward and passed south of Shipsewana where only minor damage was reported. It passed along the north edge of Rainbow Lake where damage was extensive. The tornado then disappeared again approximately two miles east of Rainbow Lake. About the same time a tornado was sighted between Ontario and Brighton, once again the tornado disappeared about a mile south of Brighton. Two miles east of Orland in Stueben county a number of farm homes were damaged or destroyed and the tornado demolished 30 to 50 cottages at a small lake known as Lake Pleasant, fortunately they were unoccupied. At Lake Barton 20 trailers were damaged.

DETROIT, MICHIGAN

Issued at 5:28 PM EST.
Severe Weather Forecast Number 69
U.S. Weather Bureau Tornado Forecast for...
Portions of Northern Indiana
Portions of Southern Michigan and
Portions of Northwest Ohio

Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 10 miles northwest of Lafayette Indiana to Detroit Michigan from the present time til 8 PM CST this Sunday evening.

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Issued at 7:00 PM EST.
Severe Weather Forecast Number 71
U.S. Weather Bureau Tornado Forecast for...
Portions of Central Michigan

Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 20 miles south of Muskegon Michigan to 60 miles east of Gladwin Michigan from the present time til 8 PM CST this Sunday evening.

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Issued at 7:45 PM EST.
A severe thunderstorm was located by radar at Brooklyn Michigan at 7:45 PM EST. This storm is moving in an east northeast direction. People in the vicinity of Manchester Saline Clinton Ypsilanti and Detroit are cautioned to be on the alert during the next 30 to 60 minutes and to take appropriate safety precautions. As additional information becomes available it will be broadcast by this station.

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Issued at 7:57 PM EST.
State Police reported a tornado 10 miles south of Coldwater Michigan at 7:50 PM. Asked for fire equipment and ambulances. No further information available. This storm is being tracked by Weather Bureau Radar at Detroit.

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Issued at 8:10 PM EST.
Severe Weather Forecast Number 72
U.S. Weather Bureau Tornado Forecast for...
Portions of Indiana
The Northwest portion of Ohio and
portions of Southeast Michigan

Scattered severe thunderstorms with a few tornadoes large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 60 miles southwest of Indianapolis Indiana to 20 miles south of Detroit Michigan from 8 PM to midnight CST this Sunday evening.

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DETROIT (Continued)

Issued at 8:57 PM EST.
Flint Michigan reports winds up to 63 mph. Willow Run Airport reports hail of one-half inch.

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Issued at 9:10 PM EST.
Report of marble size hail at foot of Livernois and the Detroit River at 9:05 PM.

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Issued at 9:50 PM EST.
The following for press radio and TV.
Detroit Weather Radar at 9:45 PM shows all that is left of the thunderstorms in Michigan is located east of a line from Bay City Michigan to Pontiac to Adrian. All of the thunderstorm activity should be out of Michigan by shortly after 10 PM EST.

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Issued at 10:00 PM EST.
The threat of severe thunderstorms and possible tornadoes has now ended in southeast Michigan. Scattered thundershowers will continue in the area for about another hour. The squall line that passed through the Detroit area at approximately 9 PM this evening produced locally severe thunderstorms with hail and high winds in the greater Detroit area. Maximum wind gusts of 43 mph were reported at Detroit City Airport while at Metropolitan Airport winds gusts to 45 mph were observed. Extremely heavy precipitation of one inch in less than a half hour in the Detroit Metropolitan Airport area with half-inch hailstones reported at Ypsilanti. Hail was also reported in the Detroit area at the foot of Livernois in the Fort Wayne vicinity. Spotty damage reports have been received including one of a barn being blown off its foundation in a southwestern suburb.

With the passage of the squall line to the east of the Detroit area the threat of severe thunderstorms and possible tornadoes has now ended for the night.

ALSYM A MKCC 1200005

SEVERE WEATHER FORECAST NUMBER 71 120000

ISSUED 6 PM CST APRIL 11 1965

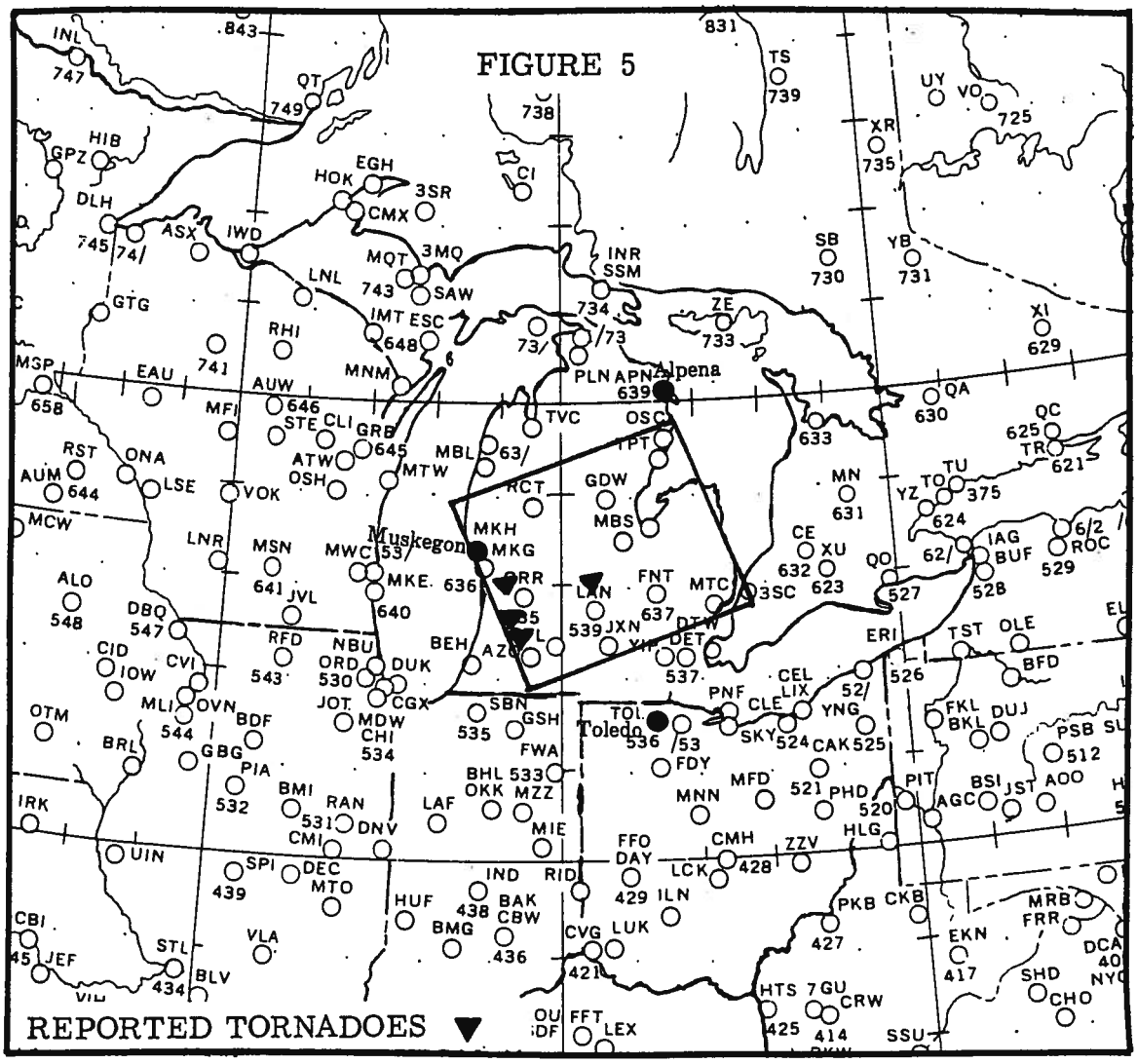
U.S. WEATHER BUREAU TORNADO FORECAST FOR....

PORTIONS OF CENTRAL MICHIGAN

SCATTERED SEVERE THUNDERSTORMS WITH A TORNADO OR TWO LARGE HAIL AND LOCALLY DAMAGING WIND STORMS ARE EXPECTED IN AN AREA ALONG AND 60 MILES EITHER SIDE OF A LINE FROM 20 MILES SOUTH OF MUSKEGON MICHIGAN TO 60 MILES EAST OF GLADWIN MICHIGAN FROM THE PRESENT TIME TIL 8 PM CST THIS SUNDAY EVENING.

CRUMRINE....0009

FIGURE 5



FLINT, MICHIGAN

Issued at 6:10 PM EST
Scattered severe thunderstorms with a tornado or two, large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 10 miles northwest of Lafayette, Indiana to Detroit, Michigan from the present time til 9 PM, EST this Sunday evening. (added - Flint is located in the extreme northeast corner of this area. At the current time thunderstorms are located in extreme southwest Michigan and northern Indiana).
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Issued at 7:15 PM EST
An area of severe thunderstorms now located in an area bounded by the following cities: Battle Creek to Fort Wayne to Kalamazoo to Muskegon to Mount Pleasant to Battle Creek, moving east-northeast 60 miles per hour. Severe thunderstorms are expected in the Flint area between 8:30 and 9:00 p.m., EST.
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Issued at 8:00 PM EST
A line of severe thunderstorms with a few tornadoes, hail and locally damaging winds from Saginaw to Lansing to Battle Creek is expected in the Flint area from the current time until around 9:30 p.m., EST.
(This warning was also distributed to remainder of counties in area of responsibility, with their county names included in the warning area.)
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Issued at 9:00 PM EST
A line of severe thunderstorms in the Flint area with high winds and possible tornadoes expected to continue for the next 30 to 60 minutes.
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Issued at 9:50 PM EST
All-clear released at 9:50 PM, EST.
The threat of severe thunderstorms, tornadoes and damaging winds is now over for the Flint area.

APPENDIX 5-A

LANSING, MICHIGAN

Issued at 5:47 PM EST.
Issued to Michigan State Police.
A tornado or two may occur between 5:45 PM EST and 9:00 PM EST in Michigan south of a line from Gary Indiana through Benton Harbor to 10 miles north of Flint to Detroit.

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Issued at 6:00 PM EST.
Severe Weather Forecast Number 69
U.S. Weather Bureau Tornado Forecast for....
Extreme Southern Wisconsin
Extreme Eastern Iowa
Portions of North Illinois
A few severe thunderstorms with large hail damaging winds and one or two tornadoes are expected from 1 PM until 6 PM CST this Sunday afternoon and evening in the area bounded by the points 40 miles south of Burlington Iowa to 50 miles west of Lone Rock Wisconsin to Milwaukee Wisconsin to 40 miles south east of Chicago Illinois back to the point 40 miles south of Burlington Iowa.

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Issued at 6:55 PM EST.
Radar shows a line of severe thunderstorms at 6:45 PM extending from Muskegon to Benton Harbor to Lafayette Indiana and moving eastward at about 45 mph.

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Teletypewriter and telephone communications partially failed at 7:15 EST and were not fully restored until 8:20 EST.

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Issued at 7:18 PM EST.
Issued to State Police.
This is a tornado forecast. A tornado or two may occur between 7:00 PM EST and 9 PM EST in Michigan south of a line from Ludington to Alpena.

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Issued at 7:50 PM EST.
Use CONELRAD signal. A funnel cloud was observed at 10 miles south of Coldwater at 6:50 PM EST and 4 miles southwest of Hillsdale at 7:15 PM EST moving north east of Hillsdale at 7:15 PM EST moving northeast. People in the vicinity of Hillsdale County Ingham County Eaton County Clinton County Jackson County Shiawassee County and Gratiot County are cautioned to be on the alert during the next 30 to 60 minutes and to take appropriate safety precautions. If this storm is seen in your area notify the sheriffs office immediately. Do not make calls to the Weather Bureau requesting information about this storm. If additional information or warnings are necessary they will be broadcast by this station.

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Issued at 8:16 PM EST.
Reports from south side of Lansing of 3/4 inch hail and winds gusting to around 50 mph at 8:05 PM. The severe thunderstorm that is in the city of Lansing at the present time of 8:16 PM EST is part of a squall line extending from 50 miles north of Lansing to 150 miles south of Lansing. The squall line is about 15-20 miles wide. We are having winds up to 50 mph at the airport with moderate rain showers. We have had 3/8 inch hail.

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Issued at 8:37 PM EST.
Issued to State Police.
There is a possibility of a tornado between the present time and 1:00 AM Monday in an area south of line from Sturgis to Howell to Detroit.

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Issued at 9:00 PM EST.
All Clear issued for Lansing.

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GRAND RAPIDS, MICHIGAN

Issued at 5:20 PM EST.
At 5 PM a squall line with several severe thunderstorms was near Milwaukee Chicago moving eastward about 50 mph. This squall line will reach the eastern shore of Lake Michigan at New Buffalo about 6 PM andthe Muskegon Holland Benton Harbor area by 6:30 PM and the Grand Rapids Kalamazoo area by about 7 PM today. There will likely be some severe thunderstorms with large hail and damaging winds over west central and southwestern lower Michigan as this squall line passes.

This is for immediate broadcast.

There will also be frequent statements on this squall line until it has passed western lower Michigan. Please be on lookout for same.

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Issued at 5:50 PM EST.
Weather Bureau Tornado Forecast for...
Portions of Northern Indiana
Portions of Southern Michigan and
Portions of Northwest Ohio
Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind stroms are expected in an area along and 60 miles either side of a line from 10 miles northwest of Lafayette Indiana to Detroit Michigan from the present time til 9 PM EST this Sunday evening.
In lower Michigan this includes southern Berrien County Southern Van Buren Southern Barry all of Kalamazoo Calhoun Cass St. Joseph and Branch Counties.

It includes all of lower Michigan from Gary Indiana to Benton Harbor to 10 miles north of Flint to Detroit south of the line connecting these points.

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Issued at 5:52 PM EST.
Progress Statement on Squall line
From South Bend Indiana Weather Bureau
Severe Thunderstorm and Tornado Warning
Radio and Television stations are requested to use emergency frequencies.

Radar indicates some very strong storm echoes in the vicinity of Michigan City Indiana and in an area just west of Knox Indiana. In these areas a tornado may touch the ground. Residents in the counties of LaPorte Starke and Marshall should be on the alert for possible tornadoes and severe thunderstorms for the next 30 to 60 minutes and to take appropriate safety precautions.

If a storm is observed in these areas that is considered severe promptly notify the Weather Bureau at South Bend Indiana.

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Issued at 6:01 PM EST.
A very strong radar echo is reported at 5:45 PM over Michigan City Indiana moving northeastward at 50 MPH. This storm may have destructive winds and possible tornado and hail.
People in Berrien Van Buren and Cass Counties should watch for severe storms and if one is seen take cover in southwest corner of the basement or other low shelter.
Radio and television stations use emergency action notification signal. For information of people in these counties.

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Issued at 6:15 PM EST.
Progress Statement on Squall line
The squall line at 5:45 PM was near Manitowoc Wisconsin across Lake Michigan southward to 20 miles east of Chicago. It continues to move eastward about 55 mph with several very strong radar echoes.
It has two of the strongest echoes. One near Michigan City Indiana and the other about twenty miles further south.
This squall line will reach the Benton Harbor Muskegon shore by about 6:30 PM and the Grand Rapids Kalamazoo line by about 7 PM. This squall line will have several severe thunderstorms particularly in Berrien Van Buren and Cass Counties where there could be a tornado or two within the next 45 minutes.

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Issued at 6:55 PM EST.
Radio and TV stations covering the areas affected are requested to use the emergency action notification signal as a preface to this warning.
Tornado Warning.
Tornadoes have been reported in northern Indiana near the Michigan border duri during the past few to 15 minutes.
This tornado warning extens the previous tornado warning issued for Berrien Cass and Van Buren Counties until 7:30 PM. It also warns people in Cass and St. Joseph counties to be on watch for these danagerous storms from present time 7 PM until 8 PM.
At 6:45 PM the squall line was just east of Muskegon Benton Harbor New Buffalo. It still contains strong radar echoes mainly in the southern sector.

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GRAND RAPIDS (Continued)

Issued at 7:08 PM EST.
All people in northern Kent County Montcalm County and Ionia County are warned to take precautions against damaging windstorms possible tornadoes during the next 30 to 45 minutes.
The above is a tornado warning for the areas concerned.
Radio stations and TV in the Grand Rapids Ionia areas are authorized to use the emergency action notification signal as a preface to the above warning statement.

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Issued at 8:25 PM EST.
All clear for southwestern lower Michigan Counties as follows...Montcalm.. Ionia..Barry..Calhoun..Branch..St. Joseph..Kalamazoo and Westward.
The squall line is now in central lower Michigan near Alma Lansing Coldwater that is 8:25 PM.

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Issued at 8:37 PM EST.
This is the All Clear for all tornado forecasts and warnings issued for portions of western lower Michigan this evening.
The squall line which caused so many severe storms is now in central lower Michigan and moving eastward.

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ALSYM A MKCC 120117

SEVERE WEATHER FORECAST NUMBER 72 111910

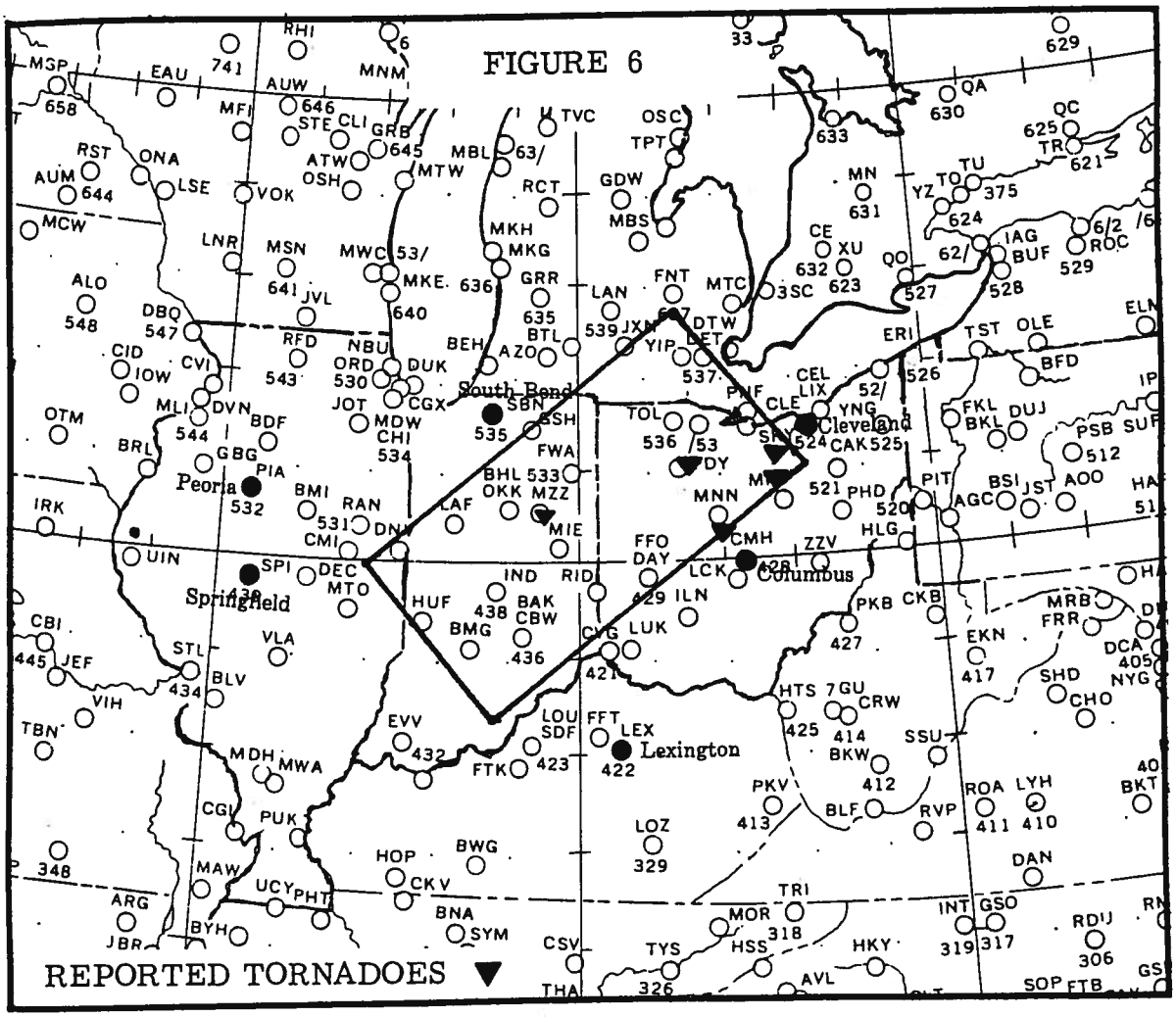
ISSUED 710 PM CST APRIL 11 1965

U.S. WEATHER BUREAU TORNADO FORECAST FOR....

PORTIONS OF INDIANA
THE NORTHWEST PORTION OF OHIO AND
PORTIONS OF SOUTHEAST MICHIGAN

SCATTERED SEVERE THUNDERSTORMS WITH A FEW TORNADOES LARGE HAIL AND LOCALLY DAMAGING WIND STORMS ARE EXPECTED IN AN AREA ALONG AND 60 MILES EITHER SIDE OF A LINE FROM 60 MILES SOUTHWEST OF INDIANAPOLIS INDIANA TO 20 MILES SOUTH OF DETROIT MICHIGAN FROM 8 PM TO MIDNIGHT CST THIS SUNDAY EVENING.

CRUMRINE....



CLEVELAND, OHIO

Issued at 5:45 PM EST.
For Northwest Ohio.
Scattered severe thunderstorms and possibly a tornado expected until 9 PM EST west and southwest of Sandusky. Scattered thundershowers continuing thru area until soon after midnight. Continued windy and mild. Low 52-58. Partly cloudy windy and a little cooler Monday. High 55-68.

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Issued at 5:45 PM EST.
For Sandusky and Vicinity.
Scattered severe thunderstorms and possibly a tornado expected til 9:00 PM EST. Windy and mid tonight with a few thundershowers continuing til after midnight. Low 55. Partly cloudy windy and not so warm Monday. High 59.

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Issued at 8:30 PM EST.
For Northwest Ohio.
Scattered severe thunderstorms and possibly a tornado expected till 1 AM EST. Scattered thunderstorms continuing thru area tonight. Continued windy and mild. Low 52 to 58. Partly cloudy windy and a little cooler Monday. High 55 to 60.

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Issued at 8:30 PM EST.
For Sandusky and Vicinity.
Scattered severe thunderstorms and possibly a tornado expected till 1 AM EST. Windy and mild tonight with a few thundershowers continuing tonight. Low 55. Partly cloudy and not so warm Monday. High Monday 59.

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Issued at 10:00 PM EST.
A line of severe thunderstorms are at present moving through western Ohio. At their present rate of movement eastward a possibility of locally strong winds and some hail exist for the Cleveland area during the hours 11 PM Sunday till 2 AM Monday.

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Issued at 10:30 PM EST.
A line of thunderstorms are presently moving eastward through western Ohio. At their present speed they should reach the western suburbs of Cleveland between 11 PM and 1130 PM this Sunday evening and progress rapidly eastward through the city. Locally strong winds with gusts to 50 mph hail and heavy rain are expected to occur in the Cleveland area as these thunderstorms pass eastward. The thunderstorms are expected to pass eastward and clear the Cleveland area by 230 AM Monday. Further bulletins will be issued on the progress of these thunderstorms if necessary.

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APPENDIX 6A

Issued at 11:20 PM EST.
Tornado warnings are in effect for eastern Huron southern and central Lorain northern Medina and southern and central Cuyahoga counties. Progress on these storms is being closely watched by the Weather Bureau and advisories will continue to be issued as to their movement.

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Issued at 11:30 PM EST.
In addition to the severe thundershowers now in progress in North Central Ohio a severe thunderstorm has been moving across eastern Indiana and north western Ohio during the past few hours which has spawned several tornadoes. This storm is expected to pass thru central Lorain northern Medina and southern Cuyahoga counties during the next hour and one half. The band covered by the tornadoes from this storm is very narrow and intermittent but precautions should be taken in the above mentioned areas. Further bulletins will be issued if new information becomes available or at 1 AM EST. Please do not call the Weather Bureau.

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Issued at 12:23 PM EST.
Tornado warnings are discontinued for portions of southern Lorain and northern Medina counties where threat of a tornado has diminished but for those sections of southern Cuyahoga northern Summit and Geauga counties a watch should be maintained over the next two hours for further possible tornadoes. Further progress of this severe weather will be watch closely by the Weather Bureau and bulletins issued as necessary.

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Issued at 1:00 AM EST.
The threat of tornadoes in the greater Cleveland area and southern Cuyahoga Geauga and northern Summit counties has ended. A few thundershowers will continue over eastern counties for the next two hours. Partly cloudy and cooler Monday and Monday night. High Monday 60. Low Monday night near 40. Tuesday mostly sunny with little change in temperature.

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CLEVELAND (Continued)

Issued at 2:30 AM EST.
An all clear has been issued in Ohio northwest of a line from near Steubenville Ohio on the Ohio River to Cincinnati and including the Columbus area. Thunderstorm activity continues in Ohio southeast of this line and an alert for severe weather continues in portions of Ohio southeast of this line. Activity is diminishing and becoming less intense according to radar reports.

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Issued at 4:00 AM EST.
An all clear is issued for Ohio from severe weather earlier in the night. Activity has diminished in the state and has moved to the east and southeast.

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(NOTE: Northwest Ohio includes - Williams..Fulton..Lucas..Wood..Henry.. Defiance..Paulding..Putnam..Hancock..Van Wert..Allen..Mercer.. Auglaize..Hardin..Wyandot..Crawford..Seneca..Sandusky..and Ottawa counties.

SUMMARY OF TORNADOES THAT OCCURRED IN NORTHERN OHIO-April 11, 1965

Columbia Hills to Strongville. From a report by P.F. Jacoby

The tornado crossed Cowley road about 2 miles south of Ohio Route 82. Two homes and two barns were severely damaged. On station road about 1 and 1/2 miles south of route 82 the storm appeared to have been split into two pathes about 1/2 mile apart. Near the intersection of Columbia River Road and Adkins Road, two damaged areas were observed, 1/4 to 1/2 mile aprt. On route 252 about 1 mile south of route 82 two houses and a barn were completely demolished. Large trees laying 50 feet apart were lying in opposite directions. On Broone road in Columbia Hills, 1/2 mile south of route 82, 7 homes were demolished, 2 completely gone. The tornado crossed the intersection of Marks road and route 82, damage was extensive. The tornado then crossed route 237 just south of the B&O tracks and north of route 82. In Westwood Estates east of route 237 in Strongsville, about 25 homes were destroyed. On route 42 in Strongsville, the tornado passed over St. Joseph School and the old St. Joseph church. About 1/2 mile east of route 42, one house was destroyed and damage to 4 other homes occurred: this was the end of the path.

Pittsfield to LaGrange to Grafton, Ohio. From a report by Robert F. Bowes.

In Pittsfield at intersection of routes 58 and 303, the destruction was total. Two churches, town hall, a small store and 3 or 4 homes. Damage suggests main center passed just north of intersection..On route 301, 1.4 miles north of LaGrange, an eye witness noted the tornado west of home. Base of clouds again as high as line of trees about 1/2 mile west. The tornado was quite wide with sides tapering about 10-15 degrees to the ground. Tornado was easy to see due to continuous lightning. Damage lasted for 10 to 15 seconds.The damage occured south and east of Grafton, the maximum path width was 800 feet, generally about 500 feet. It appears that tornado was just touching ground as it hit the city and lifted again 1/4 mile east of town. The Red Cross estimates that 200 homes were damaged and 50-100 badly damaged.

Rockway. From a report by Raymond R. Waldman.

The tornado struck at approximately 10:30 PM and the path was from the southwest towards the northeast. It varied from about 1/4 mile to 1/2 mile in width and was about a mile long. Four homes were completely destroyed, three badly damaged. A small portion of the of the Pennsylvania Railroad right of way was torn up near route 224 in Rockway. Numerous telephone poles were blown down and two large trailers were overturned.

TOLEDO, OHIO

Issued at 5:45 PM EST.
A few scattered severe thunderstorms may move across northwestern Ohio between 7 PM and 11 PM tonight. Strong gusty surface winds with possible hail conditions may be in these storms from 7 PM to 11 PM.

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Issued at 8:23 PM EST.
A line of thunderstorms extending north and south across eastern Indiana will move into northwestern Ohio shortly and into the Toledo area by 10 PM. Some gusty surface winds can be expected along with possible hail in larger thunderstorms.

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Issued at 8:40 PM EST.
Scattered severe thunderstorms a tornado or two large hail and locally damaging winds are expected over northwestern Ohio from 9 PM to 1 AM.

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Issued at 9:20 PM EST.
A tornado has been sighted near Van Wert Ohio and is moving eastward. All necessary precautions should be taken in the area east of Van Wert Ohio.

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Issued at 10:40 PM EST.
All Clear - The thunderstorms have moved east of the area and the threat of any tornadoes has ended for northwestern Ohio. There is a chance of a few widely scattered thundershowers into the early morning hours but that is the extent of it.

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COLUMBUS, OHIO

Issued at 5:30 PM EST.
The Weather Bureau has issued a severe weather forecast for portions of Northern Indiana Southern Michigan and Northwest Ohio. The portion Ohio affected is the area northwest of line from Greenville through Findlay to Sandusky.
Scattered severe thunderstorms with a tornado or two large hail and locally damaging wind storms are expected in an area along and 60 miles either side of a line from 10 miles northwest of Lafayette Indiana to Detroit from the present time until 8 PM this evening.

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Issued at 6:10 PM EST.
At around 6 PM a tornado was sighted just northwest of Plymouth Indiana which is about 25 or 30 miles south of South Bend.

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Issued at 8:10 PM EST.
The Weather Bureau has issued another severe weather forecast for portions of North Indiana Northwest Ohio and Southeast Michigan. The portion of Ohio affected is bounded by a line from the Sandusky area to 30 miles southwest of Cleveland and from that point to Delaware to Dayton and southwest to the Indiana border.
Scattered severe thunderstorms with a few tornadoes large hail and locally damaging wind storms are expected in an area along and either side of a line from 60 miles southwest of Indianapolis Indiana to 20 miles south of Detroit Michigan from 9 PM EST to 1 AM April 12.

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Issued at 9:15 PM EST.
Columbus weather radar showed a few echoes to the west and northwest of Columbus.
A very intense echo was over Lima. A thunderstorm was over Ridgeville Indiana.
A moderate to heavy storm about 10 miles west of Toledo.

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Issued at 9:15 PM EST.
Severe Weather Statement from Fort Wayne Indiana.
The Weather Bureau radar at Baer Field shows the strong hook echo now just a mile or two south of Van Wert Ohio and weakening in intensity. The tornado touched down at Berne three miles west and lies northeast..several houses destroyed and ambulances rushing to the scence. Tornado hit between 15 minutes after and 8:45 PM EST. All lights out at Marion Indiana and egg size hail.
A report just received at the Columbus Weather Bureau from Fort Wayne through the Fort Wayne signal department that three tornadoes hit Marion Indiana at 9:07 PM EST with considerable damage to veterans hospital.
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Issued at 9:34 PM EST.
The weather radar at Columbus shows a line of thunderstorms from Reno by the Lake to Findlay to Grand Lake to Versailles and on into Indiana. This line extends well southwestward into Indiana and the movement is from 260 degrees at about 40 mph. The nearest to Columbus is 60 miles to the northwest. At the present rate of movement these thunderstorms will move into the central Ohio area around midnight. With these thunderstorms there will be the possibility of strong surface winds possible hail and heavy rain. As further developments arise we will keep you posted on these potentially dangerous storms.

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Issued at 10:05 PM EST.
Columbus weather radar shows that the line has intensified and the nearest to Columbus at this time are in the Bellfontaine Piqua area. There is still a very long line and in conjunction with the Cincinnati radar report this line runs from Fostoria southwestward to Bellfontaine Sidney Greenville south westward to Indianapolis to about 40 miles south of Terre Haute Indiana. The line is included in an area of thunderstorms and showers that takes in most of northwest Ohio north of a line from Mansfield to Marysville to Troy to Richmond Indiana to southern Illinois. This area is moving southeastward at about 20 mph. We can no see distant lightning to the northwest of the airport.

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Issued at 10:25 PM EST.
Columbus weather radar now shows the line from the south shore of Lake Erie between Cleveland and Sandusky to Tiffin to East Liberty to 15 miles southwest of Richmond Indiana. This line is moving about 30 to 35 mph and will enter central Ohio area between 11:30 PM and midnight.

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Issued at 10:30 PM EST.
Forecast for Columbus and Central Ohio.
Mostly cloudy windy and warm with thunderstorms...possibly heavy tonight. Low 55. Monday partly cloudy windy and cooler. High 65.

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Issued at 10:45 PM EST.
Report received from Toledo.
City of Toledo police report entensive damage in downtown Toledo area. Not confirmed if tornado caused damage.

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Issued at 10:55 PM EST.
The line of thunderstorms now extends from Shelby southwestward to Delaware to Urbana to 25 miles northwest of Dayton and on into Indiana. The area that the line of thunderstorms is associated with is moving from the northwest however the thunderstorms are moving just about due east. The northern part of Franklin County should be getting some of the thunderstorm activity very shortly and the remainder of the city probably within the hour. These storms show up as very heavy on the radar and the possibility of strong gusty surface winds hail and heavy rains and frequent lightning discharges is imminent. There are no indications of any hook echoes on our radar at this time. There have been reports of gusty winds in excess of 60 mph with these thunderstorms. Also there have been various reports of small hail but where this hail will hit is not within our capability to say. Further reports will be issued at regular intervals.

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Issued at 11:15 PM EST.
Confirmed tornado report by police department has been received 4 miles south of Tiffin. The tornado occurred at 10:30 PM. No further details available.

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Issued at 11:30 PM EST.
The Weather Bureau has issued a severe weather forecast covering more of Ohio. Scattered severe thunderstorms with a few tornadoes large hail and locally damaging winds are expected in an area along and 60 miles either side of a line from 40 miles southwest of Dayton to 30 miles southeast of Bradford Pennsylvania from midnight to 7 AM EST Monday.

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Issued at 12:00 AM EST (Midnight).
Columbus weather radar shows a large thunderstorm in the western part of Columbus and this will move eastward across the rest of the city in the next 10 minutes bringing heavy rain and wind gusts to 60 mph. Another large thunderstorm was located over the Mt. Vernon area.

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Issued at 12:40 AM EST.
The heaviest thunderstorm activity has now passed Columbus. Radar shows the heaviest activity to be over Reynoldsburg south to Lockbourne Air Force Base and Groveport. Thunderstorms over Columbus likely to continue for next half hour then taper off to showers. The entire system is moving eastward at about 40 mph.

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Issued at 1:00 AM EST.
Columbus weather...thunderstorm...temperature 58...wind southwest 15 mph with maximum gust to 66 mph observed at 12:10 AM.
No information is yet available on damage in the Columbus area. No tornadoes have been reported over central Ohio as of now and none are apparent on the radar scope. Confirmed tornadoes 65 miles and 55 miles west southwest of Cleveland have been reported. The earlier being reported 65 miles from Cleveland at 10:30 PM and the one at 55 miles at 10:45 PM last night. There are still no reports of any tornadoes heavy damage or fatalities in the central Ohio area although numerous reports of strong winds and hail have been received. Highway patrol reports that strong winds tore down power lines and a hot wire stretched across route 23 about 2 miles north of South Bloomfield.
Highway Patrol reports tornadoes hit hard in the Toledo area...19 confirmed fatalities in this area with more expected...3 or 4 fatalities have been reported in Cairo which lies just north of Lima Ohio.

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Issued at 1:30 AM EST.
The line of heavy thunderstorms extend on a northeast to southwest line from around New Philadelphia to just west of Zanesville and Logan to Circleville and southwestward to just east of Cincinnati. This line is moving south eastward.

All Clear Statement - Columbus and Vincinity.
Severe weather forecast remains in effect for southern portions of south central Ohio and all of southeast Ohio.
Forecast for Columbus and Vicinity - clearing this morning becoming partly cloudy windy and cooler later today. Low this morning 55. High today 65.

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Issued at 2:30 AM EST.
An all clear has been issued in Ohio northwest of a line from near Steubenville to Cincinnati including the Columbus area. Thunderstorm activity continues southeast of this line and an alert for severe weather continues in portions of Ohio southeast of the line. Activity is diminishing and becoming less intense according to radar reports.

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Issued at 3:45 AM EST.
All clear for remainder of Ohio. Cancel the severe weather forecast for the remainder of Hio at 3:45 AM. The thunderstorms have moved out of the area.

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