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CORRECTIONS TO THE HISTORIC TORNADO DATABASE

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1. ABSTRACT

In the summer of 1997, a project was undertaken to make the official database of tornadoes from 1950 to 1995, for the county warning area (CWA) of the National Weather Service Weather Forecast Office (NWS WFO) in Norman, Oklahoma, available to users of the Internet. While decoding this database into an internet-friendly format, a few discrepancies or errors were discovered. The entries in the historic database were compared with entries from Storm Data to address discrepancies that were found. This paper documents some typical sources of error and problems that occurred during this process.

2. DATABASE BACKGROUND

The historic database (hereafter referred to as "the database") is compiled by the Storm Prediction Center (SPC) and its predecessor the National Severe Storms Forecast Center (NSSFC). The database of tornadoes that occurred between 1950 and 1995 was obtained from the Internet web page of the Storm Prediction Center. Since 1973, data are obtained in near real-time and corrected or adjusted as Storm Data is published. Dr. Joseph Schaefer (2000,personal communication) explains that data before 1973 were "culled from the Storm Data or its predecessor 'Climatological Data National Summary - Storm Data and Unusual Phenomena . . . ' In order to assign F-scales to tornadoes from before about 1978 (the year varies from state to state), NSSFC contracted with college students to cross reference the NSSFC file with newspaper articles. This task gave us estimates for the length, mean width, and F-scale of the tornadoes. Further the students uncovered some obviously erroneous times (and occasionally dates and counties). When information that conflicted with Storm Data were uncovered, a judgment call was made as to what most likely occurred and if necessary the NSSFC information was 'corrected' in the final data base. Also, several 'new' tornadoes (previously unreported ones) were uncovered and added to the record. There were enough of these changes that one cannot *a priori* assume that the SPC/NSSFC data is wrong and that Storm Data is right!"

3. METHODOLOGY

A BASIC computer program was written to convert the digital database into a Hypertext Markup Language (HTML) format file for use on the office web page. This program converted the county FIPS (Federal Information Processing Standards) codes into the county names, and placed the date, time, path length, path width, F-scale and the latitude/longitude of the track into the output file. The data for the 2380 tornadoes in Oklahoma and 194 tornadoes for the eight north Texas counties in the Norman WFO CWA were then supplemented by information from Storm Data and local office notes. For events between 1950 and 1959 before the introduction of the Storm Data publication, the *Oklahoma Climatological Data* and when possible *Climatological Data National Summary* (CDNS) publications were used. The latitude and longitude track information was replaced with the track as referenced by towns to construct a user-friendly listing. During this process, a few discrepancies were noted between the Storm Data entries and the decoded data from the digital tornado log. Changes to 70 tornado records (affecting only 2.7% of all entries for the area investigated) were made in the conversion from the digital database and the final product due to obvious errors or differences discovered when compared with Storm Data. As stated above, where differences between the database and Storm Data were found, it is not known if the error was in the database or Storm Data, or if the "correct" data could be determined. The text of the Storm Data entry and when possible newspaper accounts were investigated. Storm Data and the database were both checked for

consistency in their reports. Although the latitude and longitude available in the database were generally not used for this project, in those cases where a discrepancy appeared to exist, it was used (when possible) to compare with the path as described in Storm Data. If a significant difference existed between these two, it is possible that a correction was made when the database was created based on newspaper accounts as described above. For the current effort, corrections generally were made only if there was an obvious error or there was sufficient evidence to suggest that a correction was necessary. In some cases, a discrepancy remains, but there was not enough evidence to suggest which data are "correct." In the cases where there was not sufficient evidence indicating that the database was wrong, the database records were retained. Changes made to the database are listed in Appendix A, while potential inconsistencies that were not changed are listed in Appendix B.

4. SOURCES OF ERROR

A. Incorrect County Coding

Detecting potential problems with the data in a coded format was difficult since FIPS codes provided the basis for tornado locations. For example, Oklahoma tornado #70-16 was shown to strike counties 117 and 109. In a cursory examination of the coded database, there is little to suggest there is an error. However, decoding the FIPS county codes into the actual county names indicated that this tornado affected Pawnee and Oklahoma Counties. This makes the problem more obvious in that Pawnee and Oklahoma Counties are not adjacent. According to Storm Data, the tornado actually struck Canadian and Oklahoma Counties. The FIPS code was entered as 117 (Pawnee County) instead of the correct 017 (Canadian County.) Other miscoding of county information was not obvious until compared with Storm Data, especially those tornadoes that did not cross county lines. Tornado #60-36 struck near Marlow, Oklahoma, which is in Stephens County (FIPS code 137), but was in the database as Rogers County (FIPS code 131). There were two cases where a different county was listed because there is more than one community in the state using the same name. There are communities called Pumpkin Center in both Okmulgee and Comanche Counties and a tornado near Pumpkin Center was coded in the database as Okmulgee County instead of Comanche County. Similarly, a tornado near Red Springs, TX was listed in the database as Baylor County instead of Bowie County using a different community named Red Springs. In all, there were 13 instances where a change was made because of an incorrectly coded county.

In other cases, not all of the counties listed in Storm Data for a multiple county event appeared in the database. In these cases, the documented path of the tornado in Storm Data, and when possible the latitude/longitude path from the database, were compared with the county lists to verify that all of the listed counties were affected. The counties listed in Storm Data but missing in the database were then added if warranted. There were 15 tornadoes with an incomplete county list in the database as compared with the Storm Data listing and available path information.

B. Poor Documentation in Storm Data

Occasionally, the documentation in Storm Data was inconsistent. In the 1950's through 1970's, the location given for a tornado was occasionally only the location where damage was done or the nearest town. Thus only one town and its county would be listed in the "location" column of Storm Data even if the tornado traveled through more than one county as documented in the text. In these cases, preference was given to the Storm Data narrative text, especially when it agreed with the latitude/longitude path of the database. Oklahoma tornado #79-16 is an example. The "location" column in Storm Data identified "Pruitt City, Carter County." However the text stated the tornado touched down in extreme southeastern Stephens County, hit Pruitt City, then traveled another seven miles before dissipating. Due to the initial location given in Storm Data, Carter County was the only county coded in the database, although the latitude/longitude path in the database did generally agree with the path listed in the Storm Data text. In two cases, the county added was specifically listed in the text of the Storm Data entry, even though it was not included in the column describing the location. In seven additional cases, counties were added based on the geography of the path even though the missing county was not mentioned specifically anywhere within the Storm Data entry. There are additional cases where the compilers of the database had already added missing counties to the database despite the lack of inclusion in Storm Data.

In nine cases, the town and county referenced in Storm Data were in a different county than where the tornado was listed to have occurred. Of these nine, six database entries were modified. One example of this was tornado #53-22 which according to available documentation struck 22 miles southwest of Mangum and is listed in Greer County. Mangum is in Greer County, however a location 22 miles southwest of Mangum would be in Harmon County. These changes were applied *only if* the location documented was obviously in a different county. In one case, although the given county was incorrect, it is uncertain which county should be listed. Tornado #55-72 struck 20 miles southwest of Vici and is listed as Dewey County. Although Vici is in Dewey County, a point 20 miles southwest of Vici is in Ellis County, although very close to the Roger Mills County line. Since Ellis County is the most likely location, it was used.

The location usually was presumed to be correct and the counties were changed to be consistent with the path listed, especially when the location derived from the database latitude/longitude was consistent with the location given in Storm Data. As noted before in the compilation of the database, an effort was made to correct some of the incorrect data that appeared in Storm Data and several geographic inconsistencies had already been fixed in the database. However, in these cases where the location was referenced to a town in a different county, this inconsistency was removed by changing the location of the report in the creating of the database. The tornado mentioned above was listed as striking Greer County although the specific location was listed in most sources as 22 miles southwest of Mangum, which would place the event in Harmon County. To account for this difference, the location for the database was apparently moved to a point 12 miles southwest of Mangum such that the location would be in Greer County. However, almost all documentation available to the author states that the tornado occurred 22 miles southwest of Mangum and that location was used in this effort, and the county was

changed to Harmon County. Similarly, the tornado listed as 20 miles southwest of Vici had been moved to Vici, and a tornado documented as 11 miles southeast of Aline had been moved to Aline for the database. In these cases, it seems to the author that the tornado location was moved to agree with the given county in the compilation of the database, although it is more probable that the given county was listed incorrectly, as was the case in three other events from the 1970s.

There are some tornadoes listed in Appendix B that the location given would place the tornado in a different county than what was listed in the database, but is close enough to the county line that the county listed could be correct. Since in these cases it was possible (although sometimes unlikely) that the county listed is correct, the counties listed for these tornadoes were not changed, but are listed in Appendix B as potential geographic inconsistencies.

Another problem occurred when different severe weather events were combined into one entry. In most of these cases, the database was consistent with what information was available from the text of Storm Data. One exception was on May 16, 1968. The Storm Data entry for Cotton and Stephens Counties is for the combination of "Funnels aloft, Tornado and Hail." The text of the report says that a tornado touched down 8 miles southwest of Temple, with a funnel approaching Temple (all in Cotton County.) The hail is then documented to move into the Comanche area of Stephens County. The tornado is coded as striking Cotton and Stephens Counties although there is no documentation of the tornado in Stephens County. The latitude and longitude from the database also did not show the tornado path entering Stephens County. There are four tornadoes where a county was removed based on available documentation.

Finally, another problem is where the wrong county is listed in Storm Data. One example was noted with Oklahoma tornado #73-73 that was listed in both Storm Data and the digital database as striking Roger Mills County. However, the text documented that the tornado hit southeast of Collinsville, which is in Rogers County. The latitude/longitude in the database also confirmed the tornado in Rogers County as opposed to Roger Mills. In these cases, the evidence generally pointed to the path being correct and the listed county incorrect. There are five corrections in this category.

C. Changes to Tornado Classification

The methodology for the determination and classification of tornado events has evolved over the years, which leads to inconsistencies and confusion in the historic records. For example, many historic tornado descriptions mention that the tornado traveled at "treetop" level, a term that has not been used in recent years.

A more important difference was the grouping of a family of tornadoes into one tornado event, as opposed to current efforts to distinguish individual tornadoes within a family. An extreme case occurred April 29-30, 1970 when the database lists a 171-mile long path F2 tornado. The Storm Data text reads:

> "A tornado developed southwest of Altus, near Olustee, at approximately 10:25pm and then moved northeastward at around 45 mph before dissipating 5 miles south of Stillwater at 2:00 am. The tornado was sighted on the ground several times along this path and was tracked by radar at the Weather Bureau Station in Oklahoma City. A pilot who flew over the storm from east of Guthrie to south of Stillwater reported that it was definitely on the ground at times . . . "

This tornado is not described as having a continuous path, and the text later only mentions two locations where damage actually occurred, southwest of Coyle and a residential area in northwest Oklahoma City where "the funnel appeared to have been roof top level high at times, but never on the ground." Unfortunately, with the data that are available in Storm Data, determining where tornadoes occurred along the path of this storm is impossible, except these specific two points of damage. Because of this, no attempt was made to "fix" this entry, although notation was added to the public list indicating that this was not a continuous path.

Another example is tornado #73-25 where Storm Data lists the location as "near Konawa, Seminole County." This time, the Storm Data description gave specific information of where the tornado occurred or was aloft along this path. It states that "a tornado touched down briefly 4 miles southwest of Konawa . . . The funnel went aloft before reaching Konawa and then touched down again 1 mile northeast of Konawa." The database correctly had added Pontotoc County which is where the tornado would likely have been 4 miles southwest of Konawa. However, a continuous track from 4 miles southwest to 1 mile northeast of Konawa would also have included Pottawatomie County. Coordinating with the NWS WFO Norman Warning Coordination Meteorologist, from the data available in this case, it was decided to log this as two separate events, one 4 miles southwest of Konawa and the second 1 mile northeast of Konawa. One other similar event in Canadian and Logan Counties was also split into two separate events as the description of the tornado indicated the tornado lifted between touchdown points. Other tornadoes also had "missing" counties along the path described in Storm Data, where the tornado may have "skipped" a particular county. In these other cases, the missing county was added as the Storm Data text did not refer to a discontinuous path or specific locations of where the tornado "skipped" were not known. Counties were added to seven tornadoes due to the geography of the path described in the Storm Data text, even though the missing county was not listed in either the database or Storm Data. The issue of "skipping" tornadoes was only addressed for those tornadoes where the counties listed were not adjacent and created a continuity problem.

D. Other Issues

One tornado was included in the database that was not listed in Storm Data. This tornado was reported in Wilbarger County Texas and had been included in a Local Storm Report (LSR) product. This tornado was not included in Storm Data based on the reports of a meteorologist who observed this storm indicating that this event was likely not a tornado. Another tornado in Sequoyah County, Oklahoma was not included in the database, but was noted in the Storm Data report provided to the author by the NWS office in Tulsa.

Only discrepancies between the digital database and Storm Data, and other geographical inconsistencies were addressed here. Potential problems with intensity ratings have been addressed by Grazulis (1993). No adjustments were made to the F-scale intensities in the database. Any changes made to historic intensity classifications without the time necessary to study the available documentation, as was done by the creators of the original database or Grazulis, would have been somewhat arbitrary and beyond the scope of this project.

The latitude and longitude information within the database was generally not used unless investigating differences between the database and Storm Data or CDNS. However, in these times where the path described by the database latitude and longitude was plotted, there was often inconsistency between it and the other parameters of that tornado within the database, and sometimes inconsistent with anything known about this tornado. One extreme example is for a tornado listed in CDNS as 8 miles west of Minco in Grady County, but was coded in the database as Garvin County. The location based on the latitude and longitude from the database placed the tornado in Kay County, which is more than 100 miles from both the county listed in the same database record, and the path listed in CDNS. Although this is an extreme example, it was not uncommon to see a path plotted with the database latitude and longitude to be inconsistent with the counties listed in the same database record. The latitude/longitude information in the database was used primarily in this project when confirming the path listed in Storm Data for those entries where some inconsistency was noted.

Although this project primarily addressed issues of geography, problems with other parameters occasionally came to the attention of the author. One such problem was an apparent incorrect date in the database. Another inconsistency was that many tornadoes were recorded with different path length or width information than was listed in Storm Data. For Oklahoma tornadoes between 1959 and 1995, excluding tornadoes with a short and narrow path and those without a length and width given in Storm Data, 268 tornadoes had a different path length or width in the database than was listed in Storm Data. This is 14% of all tornadoes within this period, and 31% of the tornadoes with a path length documented in Storm Data as ½ mile or greater. Most often, this was a result of an effort by the National Severe Storms Forecast Center to compute the path length based on the latitude and longitude of the endpoints in the database (Schaefer, personal communication). Typically the path lengths recorded differed by just a mile or two, and because of the large number of differences, these were not generally investigated for this project and the path length listed in the database was used. However, some were noted to have more substantial errors and were changed and are included in Appendix A7.

It is also important to be aware that changes in political boundaries may create what appear to be geographic inconsistencies. The location, boundaries, or names of cities and counties may have changed. For example since statehood, two counties have been created in Oklahoma, and there have been at least two changes to county boundaries. And according to Shirk (1974), the town of Pond Creek, OK was formerly located where the present day town of Jefferson, OK is currently located, but is now 4 miles south of its historic location. Factors such as these influenced some tornadoes that struck Oklahoma before 1950, but from available information do not appear to play a role in the tornadoes since 1950 listed in the historic database.

Some of the errors that were discovered affected more than one CWA. For example, one tornado described above struck Stephens County (NWS Norman CWA) but was coded as Rogers County (NWS Tulsa CWA). If amendments are made to information derived from the database, coordination should be done with the other office such that a consistent database can be used. The Storm Prediction Center should also be made aware of any discrepancies found.

When investigating inconsistencies between the Storm Data documentation and the database, the "Late Reports and Corrections" section of Storm Data in subsequent months should also be sought out.

With tornadoes before 1959 listed in the "Climatological Data - National Summary" (CDNS) publication, there was some inconsistency noted between data listed in the monthly publication and the annual summary. Some tornadoes listed in the monthly publications did not appear in the annual summary. At least for Oklahoma and north Texas, the coded historic database was the most consistent with the tornadoes listed in the annual summary, although often more specific path information was found in the monthly publication. Those tornadoes listed in the monthly summaries that were missing in the annual summary were presumed to be appropriately deleted and not added back into the database.

Finally, the author also noted geographic inconsistencies in other states while addressing tornadoes that struck Oklahoma or that part of north Texas within the NWS Norman CWA. Indiana tornadoes were also investigated for comparison with Speheger (1990). These inconsistencies were noted in Appendix C, although it is beyond the jurisdiction of the author to recommend changes for tornadoes outside the state of Oklahoma or the Norman CWA. However, this is not a comprehensive list as the primary investigation was of Oklahoma and Norman CWA tornadoes.

5. CONCLUSION

The digital database of tornado events is a useful resource listing tornadoes documented by the National Weather Service since 1950. With a database of this size, it is inevitable that some errors are going to occur, and with its numeric format, these errors are not easily identifiable. In the summer of 1997, the author decoded this digital database to make the historic tornado records available to the public via the Norman National Weather Service Forecast Office Internet Web Page. Upon reviewing the database and comparing with Storm Data records, these errors were documented and amended for dissemination on the Internet. This list of errors is also being supplied to the Storm Prediction Center. This project was only concerned about coding errors or discrepancies with Storm Data. Other subjective aspects such as F-scale ratings were not addressed. This study only investigated tornadoes through 1995 where the data was accessible on the Storm Prediction Center web page.

Only 2.7% of the entries in the digital database for Oklahoma or the portion of north Texas within the Norman CWA were found to have errors of this type. Thus, the overall accuracy of the current database is very good. Most of the errors encountered were miscoding of county

FIPS codes, incorrect or incomplete information in Storm Data, or inconsistencies with the records in Storm Data. Inconsistencies noted in other states are noted in Appendix C.

6. ACKNOWLEDGMENTS

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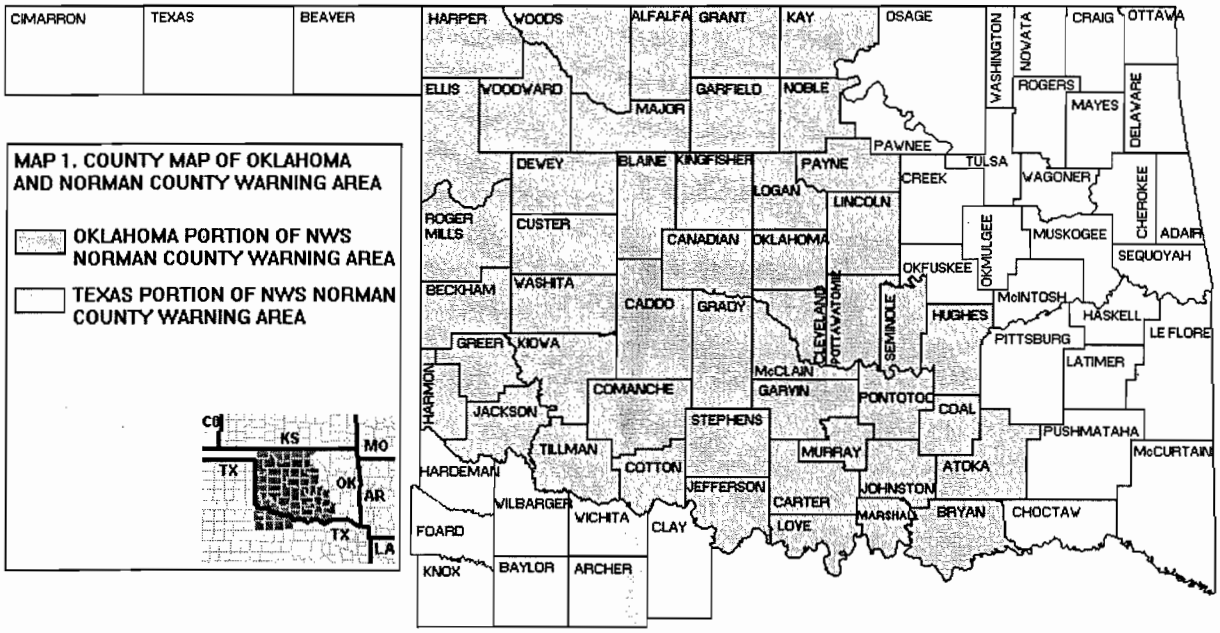
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GARVIN
PONTOTOC
COAL
JACKSON
STEPHENS
PUSHMATAHA
TILLMAN
COTTON
MURRAY
McCURTAIN
ATOKA
HARDEMAN
JEFFERSON
JOHNSTON
WILBARGER
WICHITA
CARTER
MARSHALL
BRYAN
CHOCTAW
CLAY
LOVE
FOARD
KNOX
BAYLOR
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MAP 1. COUNTY MAP OF OKLAHOMA AND NORMAN COUNTY WARNING AREA
OKLAHOMA PORTION OF NWS NORMAN COUNTY WARNING AREA
TEXAS PORTION OF NWS NORMAN COUNTY WARNING AREA
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APPENDIX A: Changes made to database
(all tornado and geographic references are Oklahoma except as noted)

A1. Incorrect county coding:

53- 48 11/18/1953 F1 Grady
8 W Minco
(Coded as Garvin County. Changed per Storm Data and location. Database latitude and longitude places tornado in Kay County and was not used)

54- 30 5/ 1/1954 F2 Pontotoc/ Seminole/ Hughes/ Okfuskee
Cedar Grove community - near Spaulding, Holdenville, Yeager, Wetumka, Weleetka
(Coded as Pontotoc/Sequoyah/Hughes/Okfuskee Counties. Changed per Storm Data, location and continuity.)

60- 27 4/28/1960 F2 Seminole
4 W- 4 NW Cromwell
(Coded as Cleveland County. Changed per Storm Data and location.)

60- 36 5/ 4/1960 F3 Stephens
3 SE Marlow
(Coded as Rogers County. Changed per Storm Data and location.)

61- 11 3/26/1961 F2 Osage/ Washington/ Nowata
Wynona - Pershing - Bartlesville - Dewey - near South Coffeyville
(Coded as Rogers/Washington Counties. Changed per Storm Data, location.)

70- 16 6/11/1970 F3 Canadian/ Oklahoma
S of Yukon - Oklahoma City (near NW 150th/MacArthur)
(Coded as Pawnee/Oklahoma Counties. Changed per Storm Data, location and continuity.)

77- 12 3/17/1977 F1 Payne
9 S Stillwater - 4 W Ripley
(Coded as Pawnee County. Changed per Storm Data and location.)

81- 67 7/21/1981 F2 LeFlore
SW of Pocola
(Coded as Kiowa County. Changed per Storm Data and location.)

84- 32 5/ 2/1984 F2 Pontotoc
5 W- 5 NW Roff
(Coded as Garvin County. Changed per Storm Data and location.)

84- 35 5/ 5/1984 F1 Seminole
3 E Little
(Coded as Okfuskee County. Changed per Storm Data and location.)

91- 18 4/ 2/1991 F0 Comanche
1 NNE Pumpkin Center
(Coded as Okmulgee County. Changed per Storm Data and location. Database latitude and longitude suggests that database entry was referenced to a different Pumpkin Center, OK that is located in Okmulgee County.)

92- 62 9/21/1992 F0 Alfalfa
1 NW Cherokee
(Coded as Beckham County. Changed per Storm Data and location. Database latitude and longitude maps tornado in Elk City (Beckham County), which is the location of a hail report adjacent to this tornado report in Storm Data.)
TX 71-115 7/6/1971 F2 Bowie
Near Red Springs
(Coded as Baylor. Changed to Bowie per Storm Data. There is a Red Springs in Baylor County, but text specifically references a Red Springs location 8 miles east of Texarkana in Bowie County.)

A2a. Counties added per Storm Data list

54- 27 5/1/1954 F3 Cotton/ Jefferson/ Stephens
Southern Cotton County - S of Hastings - near Addington - southern Stephens County
(Added Stephens County per CDNS. Latitude and longitude listed in database stops path SE of Hastings although CDNS and local records indicate that it continued to at least Addington, and likely just NE of Addington in southern Stephens County)
61- 13 3/26/1961 F3 Kay/ Osage
Kaw City - Webb City
(Added Osage County per Storm Data and location.)
72- 30 12/29/1972 F2 Mayes/ Craig/ Delaware/ Ottawa
2 S Ketchum - 9 E Miami (not continuous)
(Added Craig County per Storm Data, however text describes as "only on the ground about 20 percent of the time" and path displayed with the database latitude and longitude barely clips Craig County. Craig County was added since it was listed in Storm Data and for consistency with other "intermittent" tornadoes where specific points of damage were not known.)
74- 24 6/ 8/1974 F4 Payne/ Creek/ Tulsa/ Osage
3 SW Drumright- Drumright- Olive- Lake Keystone (Pier 51)- 7 WSW Sperry- W of Skiatook
(Added Payne County per Storm Data and location. Note: Storm Data also lists Pawnee instead of Tulsa County (see Appendix A8), but believe Tulsa County is correct.)
74- 32 6/ 8/1974 F3 Tulsa/ Rogers/ Mayes/ Craig
W of Tulsa - Tulsa - near Big Cabin
(Added Mayes County per Storm Data and geography.)
74- 33 6/ 8/1974 F3 Creek/ Tulsa/ Wagoner/ Rogers/ Mayes
Sapulpa - Tulsa - ORU - near Chouteau
(Added Creek County as Sapulpa is in Creek County and suffered damage according to newspaper accounts. Creek County is listed in Storm Data county list.)
79- 17 4/10/1979 F0 Pottawatomie/ Seminole
N of Maud
(Added Seminole County per Storm Data and Maud is on the county line. Latitude and longitude from database places tornado in Marshall County and was not used)

83- 15 4/29/1983 F2 Rogers/ Mayes
S of Chelsea
(Added Mayes County per Storm Data, although database latitude/longitude displays tornado NW of Chelsea instead of south. Storm Data states "south of Chelsea along the county line.")
83- 27 5/13/1983 F1 Custer/ Blaine
1.5 S Fay - 6 W Watonga
(Added Blaine County per Storm Data and location.)
84-1 3/ 3/1984 F0 Seminole/ Pontotoc/ Hughes
2 S Konawa - 2 SE Sasakwa
(Coded as Seminole/Hughes Counties. In Storm Data as Seminole/Pontotoc. Path as listed would barely brush Pontotoc County, and 2 SE Sasakwa remains inside Seminole County, although close to the Hughes County line. Database latitude/longitude is just inside Hughes County. Added Pontotoc per Storm Data and geography, and have retained Hughes County although it is uncertain due to closeness of end point to county line (See Appendix B1.))
84- 34 5/ 2/1984 F0 Johnston/ Pontotoc
1 N Pontotoc
(Added Pontotoc County per Storm Data, although database latitude and longitude displays tornado over the town of Ponotoc and not 1 mile north.)
84- 38 5/27/1984 F0 Cleveland/McClain
3 S- 8 SSE Noble
(Coded as McClain County only. Storm Data lists Cleveland County only. Geography of the path indicates that both should be included.)
91- 64 6/ 5/1991 F0 Atoka/Choctaw
11 SE Lane - 7 NNE Boswell
(Added Atoka County per Storm Data.)
94- 8 4/25/1994 F2 Pushmataha/ Latimer/ Le Flore
0.5 W- 1 N Albion- Talihina- 1 E Talihina
(Added LeFlore County per location and corrected Storm Data report from by NWS Tulsa. Database latitude and longitude does not show path entering Talihina, likely due to the delayed publication of Storm Data for a portion of the path. Talihina received damage from this tornado.)
TX 80- 32 4/25/1980 F1 Foard TX/ Wilbarger TX
1 NW Maragret - Margaret - 10 ESE Margaret
(Added Wilbarger County per Storm Data.)

A2b. Counties added due to Storm Data text
79- 16 4/10/1979 F3 Stephens/ Carter
9 N Ringling- Pruitt City- E of Ratliff City
(Added Stephens County per Storm Data text.)
82- 31 5/11/1982 F3 Jackson/Greer
1.5 SW Friendship - S Quartz Mountain State Park
(Added Greer County per Storm Data text.)

A2c. Counties added due to geography

50- 21 9/15/1950 F2 Seminole/ Hughes
Sasakwa
(Coded and in local notes and CDNS as Hughes County only, but local notes and CDNS also state that it struck Sasakwa, which is in Seminole County. Newspaper accounts verified that the tornado struck in Sasakwa. Database latitude and longitude displays this tornado from north of Calvin to southwest of Lamar in Hughes County, which is incomplete as it neglects Sasakwa. But the listed path suggests there may have been damage in Hughes County although not mentioned in CDNS, so Hughes County is retained also as opposed to changing to Seminole County only.)

57- 75 5/24/1957 F2 Garvin/ McClain/ Pottawatomie
SW of Wynnewood - Wynnewood; S of Wanette - Wanette - 6 NW McComb
(Added McClain County as Garvin/ Pottwatomie (as listed in the database) are not adjacent counties. However, tornado may have "skipped" this 4 mile width of McClain County. Path from database latitude/longitude suggest Murray County should also be added. Since path starts an unknown distance southwest of Wynnewood and since Murray is not included in the database county list, it is not added here.)

58- 36 11/17/1958 F3 Garfield/ Noble/ Kay
Near Fairmont - near Tonkawa
(Added Noble County due to geography as passed north of Billings.)

61- 3 2/17/1961 F3 Garvin/ Pontotoc/ Pottawatomie/ Seminole/ Hughes/ Okfuskee/ Okmulgee
Stratford - Konawa - Wewoka - 6 S Shulter
(Added Pottawatomie County due to geography. Path as listed in Storm Data and the path from database latitude/longitude would include Pottawatomie County. Database added Pontotoc County although Storm Data did not list (see Appendix A8.))

62- 30 5/26/1962 F2 McClain/ Cleveland
1 NE- ~5 E Goldsby
(Added Cleveland County as 5 E Goldsby indicated it moved into Cleveland County. County line is 2 or 3 miles east of Goldsby.)

77- 53 8/ 2/1977 F2 Dewey/ Blaine
4 SE - 12 SE Oakwood
(Added Blaine County. 12 SE Oakwood is in Blaine County.)

81- 29 5/17/1981 F3 Seminole/Okfuskee
SW of Cromwell - just NE of Okemah
(Added Okfuskee County as Okemah and area to NE of Okemah are in Okfuskee County.)

A3. County removed (no documentation found supporting tornado in this county)

68- 36 5/16/1968 F0 Cotton
8 SW Temple
(Coded as Cotton/ Stephens Counties. Removed Stephens County as Storm Data text did not mention tornado in Stephens County. Database latitude/longitude also does not show entry into Stephens County)

73- 36 6/ 2/1973 F2 Comanche
Geronimo
(Coded as Cotton/Comanche Counties. Removed Cotton County. Short/narrow tornado in Geronimo (Comanche County). No documentation of tornado in Storm Data of affecting Cotton County. Database latitude/longitude maps this tornado just inside the Comanche County line. Also changed path length and width from 4/100 to short/narrow per Storm Data. (see Appendix A7.))

75- 12 5/13/1975 F2 Cleveland
Oklahoma City (Near SW 89th and Western) - N Moore
(Coded as Oklahoma/Cleveland Counties. Removed Oklahoma County. Storm Data says tornado touched down southeast of 89th Street which is the county line and text makes it a point to say that it touched down on the Cleveland County side. Newspaper accounts say the tornado "descended" at the southwest corner of the Brookwood Village Apartments at SW 89th Street and Shartel, also indicating the Cleveland County side as the apartments are south of 89th Street. Database latitude and longitude shows the tornado near SE 59th and Kelley (Oklahoma County), but this is within a margin of only two minutes of latitude and longitude of the SW 89th and Western location.)

90- 8 3/13/1990 F3 Jefferson/ Stephens/ Carter
5 SSW Loco - Ratliff City - 3 NE Ratliff City
(Database includes Garvin County, but there is no documentation of path extending into Garvin County. Database latitude and longitude shows extension into Garvin County northeast of Ratliff City, but 1990 database entries should not have been adjusted due to newspaper accounts as historic tornadoes were, and the path published in Storm Data is presumed correct.)

A4a. Location referenced is in different county than tornado

53- 22 5/10/1953 F1 Harmon
22 SW of Mangum
(Coded as Greer County. Although Mangum is in Greer County, 22 SW Mangum would be in Harmon County. Database latitude and longitude displays this tornado just inside the Greer County line 12 SW Mangum. The author speculates that this change was to account for the geographic inconsistencies, but as available local documentation lists this tornado as 22 SW Mangum, this location has been retained and the county adjusted.)

55-64 6/17/1955 F2 Major
11 SE Aline
(Coded and in CDNS as Alfalfa County. Although Aline is in Alfalfa County, 11 SE Aline would be in Major County. Database latitude and longitude display this tornado over Aline. The author speculates that this change was to account for the geographic inconsistency, but as available local documentation gives a more specific 11 SE Aline, this location is retained and the county is changed.)

55- 72 7/ 4/1955 F1 Ellis
20 SW of Vici
(Coded as Dewey County. Although Vici is in Dewey County, 20 miles southwest would likely be in Ellis County, however Roger Mills County would also be possible. Database latitude and longitude display this tornado over Vici. The author speculates that this change was to account for the geographic inconsistency, but as most available local documentation gives a more specific 20 SW Vici, this location is retained and the county is changed to Ellis County.)
70- 20 6/11/1970 F0 Okmulgee
6 S Mounds
(Coded as Creek County. Although Mounds is in Creek County, 6 S Mounds would be Okmulgee County. Database latitude and longitude also displays the tornado in Okmulgee County.)
76- 11 4/17/1976 F1 Washita
10 NW Mountain View
(Coded as Kiowa County. Although Mountain View is in Kiowa County, 10 NW Mountain View would be in Washita County. Database latitude and longitude also displays the tornado in Washita County.)
78- 1 4/ 1/1978 F1 Kiowa
7 SW Carnegie
(Coded as Caddo County. Although Carnegie is in Caddo County, 7 SW would be in Kiowa County. Database latitude and longitude also displays the tornado in Kiowa County.)

A4b. Wrong county listed in Storm Data and therefore miscoded
65- 34 5/ 8/1965 F1 Pittsburg
Near Bache
(Coded and in Storm Data as McIntosh County. But Bache is in Pittsburg County and it was changed to Pittsburg in local documentation in late 1968 or early 1969. However, database latitude/longitude displays this tornado near Stidham in McIntosh County. Since local records were changed to Pittsburg County in 1968 or 1969, have changed this entry to Pittsburg County.)
73- 73 11/20/1973 F1 Rogers
4 SE Collinsville
(Coded and in Storm Data as Roger Mills County. But longitude was 95.5 and text said Collinsville implying Rogers instead of Roger Mills.)
78- 17 5/11/1978 F1 Washington
1.5 SE Copan
(Coded and in Storm Data as Osage County. Copan and 1.5 SE Copan are in Washington County. Database latitude and longitude displays this tornado in Washington County.)
87- 18 7/17/1987 F0 Kiowa
3 S Snyder
(Coded and in Storm Data as Tillman County. Snyder and 3 S Snyder are in Kiowa County. Database latitude and longitude displays this tornado in Kiowa County, although close to the border.)

90- 29 6/21/1990 F1 Osage
8 WNW Hominy
(Coded and in storm data as Pawnee County. Hominy and 8 WNW Hominy are in Osage County. Database latitude and longitude displays this tornado in Osage County.)

A5. Tornado deleted from database
TX 95- 26 4/17/1995 F0 Wilbarger TX
(Had been a preliminary report listed in an Local Storm Report but not entered in Storm Data after further investigation.)

A6. Tornado added to database
4/27/1994 F0 Sequoyah
5 S Sallisaw
(Documented in December 1994 Storm Data "Additions" section.)

A7. Other changes
53- 42 7/ 6/1953 F1 Lincoln
3 N Stroud
(Coded as July 9 although local notes, CDNS and database sequence order indicated July 6. No records of July 9 tornadoes found in the Daily Oklahoman newspaper.)
56- 11 4/2/1956 F3 Lincoln/ Creek
Near Jacktown - near Drumright
(Coded as 68 injuries. Changed to 98 per CDNS and local notes. Also see Appendix B1.)
58- 26 8/23/1958 F? Woods
E of Waynoka
(Length coded as 25 mi. Changed to n/a. CDNS lists 25 mile path of "tornado, wind, rain and electrical" with tornado only listed E of Waynoka within that path. Database latitude/longitude displays path from 5 miles NE Waynoka to near Cleo Springs in Major County.)
58-35 11/17/1958 F3 Cotton
3 E Cookietown - 3 E Walters
(Length coded as 66 mi. Changed to 10 mi per CDNS. Database beginning longitude was 99.24 degrees west which puts the point near White City, TX. However a longitude of 98.24 degrees west would place beginning point 3 E Cookietown OK as documented.)
61-9 3/26/1961 F2 Canadian
5 NW El Reno
(Path length coded and in Storm Data as 29 miles, but that includes the track of the "funnel" toward Crescent. Changed to n/a. If the 29 mile path were found to have been justified, then Kingfisher and perhaps Logan County should have been added.)
61- 24a 4/30/1961 F2 Canadian

61- 24b 4/30/1961 F2 Logan

Near Piedmont ; near Navina and Seward

(Coded as Canadian County only. Storm Data text reads: "Tornado research plane reported sighting four funnels in area of Canadian County northwest of Oklahoma City. One of these tornadoes [sic] touched down momentarily and destroyed a barn near Piedmont. Apparently lifted and touched down again at Navina and Seward where several farmsteads were damagedover a path about 3 miles long and 200 yards wide." Navina and Seward are in Logan County. Path from coded database indicated a tornado on the ground 30% of the time along the path as listed in Storm Data, despite Logan County not being coded. If this were a continuous path, Oklahoma County should be added due to geography. However given the description in Storm Data, split this record into two events.)

67- 29 6/10/1967 F3 Kingfisher

Omega

(Length coded as 17 mi. Changed to n/a. Database latitude/longitude displays path from near Omega to 4 miles northwest of Dover. With the possibility of other evidence, this should likely not be changed in the actual database, but for local use since no local documentation was found of the tornado toward Dover and since it is a minor issue, it was changed to n/a.)

73- 25a 5/23/1973 F1 Pontotoc

73- 25b 5/23/1973 F1 Seminole

4 SW Konawa; 1 NE Konawa

(Split into two events based on Storm Data text: "a tornado touched down briefly 4 miles southwest of Konawa... The funnel went aloft before reaching Konawa and then touched down again 1 mile northeast of Konawa." If the track were continuous, Pottawatomie County should be added. Coded database indicates a tornado on the ground 60% of the time along the path described in Storm Data. Also see Appendix A8.)

73- 36 6/ 2/1973 F2 Comanche

Geronimo

(Changed path length and width from 4 miles and 100 yards to short/narrow per Storm Data. Also, deleted Cotton County (see Appendix A3.))

91- 53 5/16/1991 F1 Okmulgee

1.5 S Mounds

(This is a change to what is listed in Storm Data, and not to the database. Storm Data lists as 1 miles south of Mounds (which would be in Creek County), but says that it was just south of the county line, so changed to1.5 S Mounds which would place event in Okmulgee County. Database latitude/longitude does display tornado on the Okmulgee side.)

93- 59 9/13/1993 F1 Okfuskee

Bearden- 1 E Bearden

(Length coded as 25 miles. Changed to 1 mile per Storm Data, track. Database latitude/longitude path extends from Bearden to 23 miles NE of Bearden. Since this is a recent event, presumed the path listed in Storm Data was correct.)

94- 12/13 4/26/1994 F1 Atoka/ Pushmataha/ Pittsburg
Daisy- 9 NE Daisy - 12 ENE Daisy
(Combined tornadoes 94-12 and 94-13. This tornado crossed the CWA border between NWS Norman and NWS Tulsa, but separate events were logged in the database for each CWA. The text in both offices' Storm Data entries indicate that this was a single tornado.)
94- 14/15 4/26/1994 F1 Pushmataha/ Latimer
2 N Clayton- 3 N Kiamaichi - 3 NNE Albion
(Combined tornadoes 94-14 and 94-15. This tornado crossed the CWA border between NWS Norman and NWS Tulsa, but separate events were logged in the database for each CWA. The text in both offices' Storm Data entries indicate that this was a single tornado.)
94- 26 5/ 6/1994 F0 Okfuskee
0.5 SE- 1.25 SE Bearden
(Fixed time, length, width of 2200 CST, 0.1 miles and 10 yards from database to 2340 CST, 0.75 miles and 50 yards per corrected Storm Data report published in December 1994 Storm Data.)
94-30 6/9/1994 F0 Sequoyah
Near Muldrow
(Corrected time from 0600 to 0638 as published in the December 1994 Storm Data "Additions" section.)
95- 13 4/17/1995 F0 Murray/ Garvin
2.5 NW Joy
(Length coded as 2 mi. Changed to 0.1 mi per Storm Data)

A8. Coded county retained though inconsistent with Storm Data
51- 27 6/ 6/1951 F2 Grady
Cox City
(Local notes show as Stephens County but Grady County would be correct. Database latitude/longitude shows path from 1 E Cox City (Grady County) to 4 WNW Purdy (Garvin County), although Garvin County was not added to the database county list and no local documentation was found for the Garvin County portion.)
54- 13 4/29/1954 F1 Alfalfa
Near Amorita
(Listed in local notes and climatological data summary as "near Orion", which is in Major County. CDNS lists location as "Amorita and Orion, Alfalfa County" with description of "Funnel cloud observed touching the ground. One farmstead struck near Orion Community." Newspaper accounts mention a tornado "near Amorita" in Alfalfa County. Therefore, changed location to near Amorita and retained Alfalfa County as coded in the database. There may have been a separate event near Orion in Major County, but it is not added.)
61- 3 2/17/1961 F3 Garvin/ Pontotoc/ Pottawatomie/ Seminole/ Hughes/ Okfuskee/ Okmulgee
Stratford - Konawa - Wewoka - 6 S Shulter
(Database correctly added Pontotoc County although Storm Data did not list. Also added Pottawatomie County due to geography (See Appendix A2c.))
73- 25a 5/23/1973 F1 Pontotoc

73- 25b 5/23/1973 F1 Seminole
4 SW Konawa; 1 NE Konawa
(Database correctly added Pontotoc County although Storm Data did not list. Also split into two events based on Storm Data (see Appendix A7.))

74- 24 6/ 8/1974 F4 Payne/ Creek/ Tulsa/ Osage
3 SW Drumright- Drumright- Olive- Lake Keystone (Pier 51)- 7 WSW Sperry- W of Skiatook
(Storm Data lists Pawnee County instead of Tulsa County, but believe Tulsa County is correct. Also added Payne County per Storm Data, location (See Appendix A2a.))

74- 35 6/ 8/1974 F2 Pottawatomie
4 SSW McLoud
(Storm Data says Oklahoma County but geography would agree more with Pottawatomie County as coded. Database latitude/longitude displays tornado at 6 SSW McLoud and in Cleveland County, which disagrees with both Storm Data documentation and with the database county, and was not used)

74- 36 6/ 8/1974 F2 Creek/Tulsa
Near Kiefer - 6 ENE Bixby
(Storm Data lists as Creek/Wagoner, but Creek/Tulsa would be correct)

APPENDIX B: Potential inconsistencies noted but changes not made to database.

B1. Possible geographic inconsistencies

These are potential geographic inconsistencies that were noted. In some cases, there was insufficient evidence to warrant a change to the record. In other cases, the available evidence shows that the record is correct and are included for completeness.

52- 2 4/20/1952 F1 Harmon/ Beckham/ Roger Mills/ Dewey
2 S Vinson - near Vici
(A continuous track would include Greer County. Database latitude/longitude lists only four discrete points (one in each county) which correspond with references to damage listed in CDNS.)

53- 9 3/13/1953 F3 Love/ Carter/ Johnston
Near Burneyville - between Dickson and Mannsville - N of Tishomingo
(Path may clip Marshall County, but without specific points of reference, it is not certain.)

54- 6 3/24/1954 F1 Delaware
S of Rose - near Jay
(Rose is in Mayes County, so beginning would be close to Mayes. CDNS mentions beginning with the vague description of "south and east of Rose", so beginning may be in Delaware County if it were "southeast" of Rose, which is how it is plotted with database latitude/longitude.)

55- 21 5/11/1955 F0 Oklahoma
W of Oklahoma City
(CDNS monthly report lists as 8 miles northwest of the Weather Service office, which would be Canadian County as the Weather Service office was at Will Rogers World Airport in 1955. CDNS annual report lists as "just west of Oklahoma City" which is vague enough that it could refer to either Canadian or Oklahoma County. Database latitude/longitude displays a point near Lake Overholser and just inside Oklahoma County.)

56- 11 4/ 2/1956 F3 Lincoln/ Creek
Near Jacktown - Drumright
(A straight path would include Payne County. Database latitude/longitude displays a curved path extending from near Jacktown to near Davenport to the Lincoln-Creek County line west of Shamrock to near Cushing in Payne County. Although the final point is believed to be incorrect as Drumright was struck by this tornado and not Cushing, the other points in the path indicate that there was enough curvature in this path to miss Payne County. Also see Appendix A7.)

58- 34 11/17/1958 F2 Caddo
5 SW - just NW of Apache
(Although Apache is in Caddo County, 5 miles due southwest of Apache would be in Comanche County. Database latitude/longitude displays a beginning point 5 WSW Apache which would keep path within Caddo County.)

60- 67 5/18/1960 F? Jackson
4 SE Humphreys
(Although Humphreys is in Jackson County, 4 miles due southeast of Humphreys would be inTillman County. Database latitude/longitude displays point at 4 SSE Humprheys which would keep tornado in Jackson County)

65- 26 5/ 6/1965 F2 Harmon/ Greer
8 W Hollis - 6 W Granite
(8 W Hollis would be in the state of Texas. Database latitude/longitude display a path extending from 6 NW Hollis (just inside the Oklahoma-Texas border) to 6 W Granite.)

67- 24 6/10/1967 F4 Custer
3 S - 6 ENE Hammon
(Hammon and 3 miles due south Hammon are in Roger Mills County although close to county line. Database latitude/longitude does display this tornado beginning in Roger Mills County, February 6, 2001 but did not add Roger Mills County to the database county list. As beginning could be just east of 3 miles due south of Hammon and remain in Custer County, Roger Mills County was not added.)

67- 39 6/11/1967 F0 Lincoln
6 SE Stroud
(Although Stroud is in Lincoln County, 6 SE Stroud would be in Creek County. Database latitude/longitude displays tornado just east of a point 6 miles south of Stroud, which would keep tornado within Lincoln County.)

69- 22 6/23/1969 F1 Creek
"5 W Drumright"
(This location as given in Storm Data would be Payne County. However, the database latitude/longitude displays this tornado as 5 E Drumright. As there is uncertainty if the Storm Data entry could have been a typographical error (perhaps typing 'W' instead of 'E'), the database entry of Creek County is retained.)

74- 5 4/20/1974 F3 Grady/ Canadian/ Oklahoma/ Lincoln
Southwest of Minco - 2 SE Mustang - S Oklahoma City - Del City - Midlothian
(Storm Data text refers to a funnel southwest of Minco with the touchdown at 3:28 pm southeast of Mustang. This would infer that Grady County should not be included, and the time should be changed from 3:00 pm to 3:28 pm. However, the description is vague enough (it is unclear from the text if 3:28 was the "first touchdown" of a path listed as non-continuous) that the database was not changed.)

74- 44 11/ 3/1974 F1 Washington
2 W Bartlesville
(Although Bartlesville is in Washington County, 2 W Bartlesville would be close to Osage County depending on what point is used to define Bartlesville. Database latitude/longitude displays tornado just inside Washington County line.)

82- 27 5/11/1982 F0 Jackson
6 W Blair
(Although Blair is in Jackson County, 6 miles due west of Blair would likely be in GreerCounty. Database latitude/longitude displays tornado just south of a point 6 miles due west Blair, which would keep tornado within Jackson County.)
84-1 3/ 3/1984 F0 Seminole/ Pontotoc/ Hughes
2 S Konawa - 2 SE Sasakwa
(Coded as Seminole/Hughes Counties. In Storm Data as Seminole/Pontotoc. End point of 2 SE Sasakwa appears to remain in Seminole County, although close to the Hughes Countyline. Also added Pontotoc County per Storm Data (See Appendix A2a.))
92- 29 5/11/1992 F1 Pittsburg
7 W Hartshorne - 4 W Higgins
(4 W Higgins places end point very close to if not in Latimer County.)

B2. Tornadoes listed in Storm Data but not included in database
* 2/19/1953 F? Coal
Near Coalgate
* 4/2/1975 F? Beckham
2 SW Elk City- Elk City- ~6 NE Elk City
(Probably confused in Storm Data with 3/27/75 event that is listed at same time of day and similar path, so the deletion of this record is likely correct.)

APPENDIX C: Inconsistencies noted in other states

A list of inconsistencies found in other states that came to the attention of the author. It is not within the authority of the author to recommend these changes since they occurred outside the jurisdiction of the Norman CWA and the state of Oklahoma, but they are noted here. This is likely not a comprehensive list.

TX 54-31 5/1/1954 F2 Clay TX
Near Buffalo Springs - near Bowie
(CDNS includes Montague County)

TX 57-130 8/12/1957 F2 Baylor TX
15 SW Seymour
(CDNS includes Throckmorton County)

OK 53- 25 (KS 53-5) 5/10/1953 F2 Grant OK/ Sumner KS/ Ness KS
near state line S of Caldwell, KS - W of Udall, KS
(Ness County KS is not near these counties.)

OK 56- 13 (KS 56-9) 4/ 3/1956 F4 Ottawa OK/ Cherokee KS/ Kiowa KS/ Jasper MO
Near Narcissa - Miami - Quapaw - Baxter Springs KS - near Joplin MO
(Kiowa County KS is not near these counties)

IN 61-32 9/24/1961 F3 Delaware IN/ Shelby IN/ Randoph IN
Near Daleville - Progress - Cowan - New Burlington - near Union City
(Shelby County is not near these counties)

IN 63-27 6/10/1963 F1 Delaware IN
Unknown
(Possible miscoding. No documentation found, but a tornado in LaPorte County is not in the database)

IN 63-29 6/28/1963 F0 Hendricks IN
Near Evansville
(Probable miscoding of county. Latitude/longitude in SPC database confirms near Evansville)

IN 65-36 9/14/1965 F2 Tippecanoe IN
2 NW Finkle - near Jefferson
(End point near Jefferson indicates Clinton County should be added)

IN 66-1 4/20/1966 F? Starke IN
4 W Walkerton
(Storm Data lists St. Joseph but location would indicate LaPorte County)

IN 67-21 12/11/1967 F? Putnam IN
3 SE Fillmore
(Storm Data says Washington County and database latitude/longitude agrees. However could not find a "Fillmore" in Washington County)

IN 68-6 4/20/1968 F1 Randolph IN
Near Farmland
(Different date listed in Storm Data)

IN 69-7 5/10/1969 F2 Johnson IN/ Shelby IN/ Rush IN
Franklin - near Freeport - near Morristown - near Knightstown
(Storm Data also included Henry County)
IN 72-1 4/6/1972 F1 Newton IN/ Jasper IN
3 NE Kentland - near Wolcott
(Storm Data includes White County)
IN 73-8 5/27/1973 F2 Monroe IN/ Johnson IN
Near Unionville - Greenwood (not continuous)
(Not adjacent counties)
IN 73-29 6/20/1973 F1 Daviess IN
Along Washington-Scott County line on SR-56
(Storm data lists as Washington and Scott Counties. Database may have referenced the town of Washington in Daviess County as opposed to the "Washington-Scott" County line.)
IN 74-18 4/3/1974 F2 Howard IN/ Grant IN
Near Windfall - W of West Liverty - Swayzee - 2 E Sweetster
(Storm Data includes Tipton County)
IN 74-21 4/3/1974 F2 Huntington IN/ Wells IN
3 SW Warren - Plum Tree - just S of Rock Creek
(Storm Data does not include Wells County)
IN 80-11 6/1/1980 F0 Boone IN
Near Huntington
(Apparent coding error. Storm Data lists as Huntington County)
IN 81-11 11/19/1981 F1 Ripley IN
E of Olean - S of Moores Hill
(Storm Data text includes Dearborn County)
IN 86-3 3/10/1986 F2 Shelby IN
3 W Boggstown - S of Fountainville
(Storm Data lists as F1)
IN 86-4 3/10/1986 F2 Shelby IN/ Hancock IN
3 W Boggstown - Fairland - near Charlottesville
(Storm Data lists as F3)
IN 89-26 9/1/1989 F2 Fulton IN
Near Bruce Lake
(Storm Data includes Pulaski County)
IN 90-22 6/2/1990 F1 Boone IN
4 SW Terhune - 4 WSW Ekin
(Storm Data text includes Clinton and Hendricks Counties)
IN 94-7 4/26/1994 F1 Lake IN
4 E Beecher IL - 3 W Cedar Lake
(Database has time of 2040, while Storm Data lists as 0940)