

National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 9714 (DSI-9714)

TORNADO Archive (Pearson Tornado Tape)

September 7, 2004

National Climatic Data Center
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1. **Abstract:** Tornado Archive contains a chronological listing, by state, of tornadoes. The reports are provided by the National Weather Service and contain statistics on injuries and damage estimates. TORNADO ARCHIVE is a dataset of the National Climatic Data Center. These data have been compiled from the Storm Data publication.

Background:

The Tornado Archive has been compiled from the Climatic Data National Summary (CDNS) from 1950-1959 and from the Storm Data Publication since 1959. These data have been coded according to the Pearson Tornado Tape format. As of the beginning of 1996, the National Weather Service (NWS) has implemented a relational database procedure for the dissemination of severe weather information called StormDat. Each NWS office FTP's a monthly file to the NWS Office of Meteorology (OM) for inclusion into the "Storm Data" Paradox relational database. Once all of the NWS Forecast offices have sent the data to the NWS, it is compressed and sent to the NCDC for quality control, publication and archival.

As one would expect, the number of tornado reports has increased yearly due to the advances in technology and an increase in population. The WSR-88D Doppler radar is instrumental in the detection of tornadoes which might not have been reported in earlier years. The increase in population in some areas has resulted in a larger number of tornadoes being reported by Skywarn Spotters and/or the general public.

These data are archived by the National Climatic Data Center (NCDC) in an 80 column text format for easy extraction by computer programs. These data are available for download in this raw text format via the Internet at the SPC web page www.spc.noaa.gov and the NCDC web page at www.ncdc.noaa.gov.

2. **Element Names and Definitions:**

Record Position	Element Name	Definition and Remarks	(Data Range)
1 - 4	Year	In 4 digit format Ex: 1998	(1950-Current)
5 - 7	Sequence#	Each tornado in numbered within the state it occurred by date and begin time	(001-999)
8 - 9	State FIPS #	The state FIPS number is a unique number assigned to the state by the National Institute for Standards and Technology. See Appendix A.	
10 - 11	Month	In 2 digit number format. Ex. 12 = December	(01-12)
12 - 13	Day	Day of the month	(01-31)
14 - 17	Time	In 24 hour format. Ex. 2359 = 11:59 PM	(0000-2359)
18 - 18	Time Zone	Indicates the time zone recorded for the tornado observation time.	(0-9)

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- 0 - Other or Unknown
- 1 - EST Eastern Standard Time
- 2 - EDT Eastern Daylight Time
- 3 - CST Central Standard Time
- 4 - CDT Central Daylight Time
- 5 - MST Mountain Standard Time
- 6 - MDT Mountain Daylight Time
- 7 - PST Pacific Standard Time
- 8 - PDT Pacific Daylight Time
- 9 - GMT Greenwich Mean Time

19 - 19 Time Accuracy Indicates the reliability of the reported tornado begin time. (0-9)

- 0 Unknown or Missing
- 1 + 15 minutes
- 2 + 30 minutes
- 3 + 45 minutes
- 4 + 60 minutes
- 5 + 75 minutes
- 6 + 90 minutes
- 7 + 105 minutes
- 8 + 120 minutes
- 9 > 120 minutes

20 - 20 Weather Event Indicates the type of weather event (0-9)

- 0 Unknown or Missing
- 1 Tornado
- 2 Funnel Cloud
- 3 Waterspout
- 4 Waterspout moving ashore
- 5 Tornado moving over large body of water
- 6 Hail 3/4 inch or greater
- 7 Winds 50 knots or greater
- 8 Hail Aloft
- 9 Extreme Turbulence

21 - 21 Event Remarks Indicates any special conditions present during event. (0-4)

- 0 Unknown or Missing
- 1 with large Hail
- 2 with Heavy Rain
- 3 with 1 & 2
- 4 No Rain or Hail

22 - 22 Number of States Total number of states the tornado passed through. (0-9)

23 - 23 Total Segments Total number of segments of the tornado. Any time a tornado crosses a county line, a new segment is counted. (0-9)

24 - 24 Segment Number The number of the segment out of the total number of segments for that particular tornado. (0-9)

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25 - 28	Beginning Latitude	In degrees and minutes. Example:3543 = 35'43" (North Latitude)	(1500-7000)
29 - 33	Beginning Longitude	In degrees and minutes. Example:10126= 101'26" (West Longitude.)	(06000-14500)
34 - 37	Ending Latitude	In degrees and minutes 0000 = Unknown or Missing	See above (1500-7000)
38 - 42	Ending Longitude	In degrees and minutes 0000 = Unknown or Missing	See above (06000-14500)
43 - 46	Track Length	Length of tornado track in tenths of miles.(0000-9999) Example: 0195 = 19.5 miles	
47 - 47	% on ground	Percent of the tornado segment path on the ground.	(0-9)
		0 100%	
		1 10%	
		2 20%	
		3 30%	
		4 40%	
		5 50%	
		6 60%	
		7 70%	
		8 80%	
		9 90%	
48 - 48	Type of Path	Indicates the direction of the movement of the tornado.	(0-9)
		0 Straight	
		1 Sinusoidal	
		2 Left turn loop	
		3 30 degrees to the left	
		4 45 degrees to the left	
		5 60 degrees to the left	
		6 Right turn loop	
		7 30 degrees to the right	
		8 45 degrees to the right	
		9 60 degrees to the right	
49 - 49	Visual Type	Describes the visual characteristics of the tornado.	(0-7)
		0 Missing or Unknown	
		1 ropelike	
		2 cone shaped	
		3 thin column	
		4 moderate column	
		5 thick column	
		6 obscured by heavy rain	
		7 no visible sign	

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50 - 50	Rotational Sense	Describes the type of tornadic rotation.	(0-2)
		0 Missing or unknown	
		1 Counter-clockwise	
		2 Clockwise	
51 - 53	Path Width	The mean tornado width in 10's of feet. Example: 528 = 5280 feet	(0000-9999)
54 - 56	Fatalities	The number of deaths recorded for the event.	(000-999)
57 - 60	Injuries	The number of injuries recorded for the event.	(0000-9999)
61 - 61	Damage Class	The estimated amount of damage caused by the event.	(0-9)
		0 \$ 0.00 or No damage reported	
		1 Less than \$50.00	
		2 \$ 50 - \$ 500	
		3 \$ 500 - \$ 5,000	
		4 \$ 5,000 - \$ 50,000	
		5 \$ 50,000 - \$ 500,000	
		6 \$ 500,000 - \$ 5,000,000	
		7 \$ 5,000,000 - \$ 50,000,000	
		8 \$ 50,000,000 - \$ 500,000,000	
		9 \$500,000,000 - \$5,000,000,000	
62 - 64	1st County FIPS Number	The county FIPS number is a unique number assigned to the county by the National Institute for Standards and Technology (NIST).	(000-999)
65 - 67	2nd County FIPS Number	See description above.	(000-999)
68 - 70	3rd County FIPS Number	See description above.	(000-999)
71 - 73	4th County FIPS Number	See description above.	(000-999)
74 - 76	5th County FIPS Number	See description above.	(000-999)
77 - 77	F Scale	Fujita Scale - Describes the strength of the tornado based on the amount and type of damage caused by the tornado. The F-scale of damage will vary in the destruction area; therefore, the highest value of the F-scale is recorded for each event. F-scale may not do a good job of representing "actual" tornado intensity in areas of sparse or poor construction (i.e., few structures to damage or flimsy structures).	(0-5)

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0	Light Damage	(40-72 mph)
1	Moderate Damage	(73-112 mph)
2	Significant Damage	(113-157 mph)
3	Severe Damage	(158-206 mph)
4	Devastating Damage	(207-260 mph)
5	Incredible Damage	(261-318 mph)

The following numbers were used in previous years to try to explain the correlation of the path's width and length to the F-Scale. These numbers are not used any longer or are of no use and/or meaning. Please use them at your own discretion.

78 PL Scale These are estimates of the storm's path length (PL). The PL scale excludes sections without surface disturbances.

PL	LENGTH (MILES)	WIDTH
0	less than 1.0	less than 18 yds.
1	1.0 - 3.1	18 - 55 yds.
2	3.2 - 9.9	56 - 175 yds.
3	10.0 - 31.9	176 - 527 yds.
4	32 - 99.9	528 - 1759 yds.
5	over 100	over 1760 yds.
6	Missing, unknown or not applicable	

79 PW Scale These are estimates of the storm's and mean path width (PW). The PW scale is averaged over the entire path length.

PL	LENGTH (MILES)	WIDTH
0	less than 1.0	less than 18 yds.
1	1.0 - 3.1	18 - 55 yds.
2	3.2 - 9.9	56 - 175 yds.
3	10.0 - 31.9	176 - 527 yds.
4	32 - 99.9	528 - 1759 yds.
5	over 100	over 1760 yds.
6	Missing, unknown or not applicable	

80 NSSFC Code Identifies the source of the data for the tornado report.

0	Missing, Unknown or Not Applicable
1	From Newspaper Clippings
2	From NWS Survey
3	From Storm Data
4	Other

3. **Start Date:** 19500101

4. **Stop Date:** Ongoing.

5. **Coverage:** North America and its territories

- a. Southernmost Latitude: 15 N. Latitude
- b. Northernmost Latitude: 70 N. Latitude
- c. Westernmost Longitude: 144 E. Longitude
- d. Easternmost Longitude: 60 W. Longitude

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6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.
Phone: 828-271-4800
FAX: 828-271-4876
E-mail: NCDC.Orders@noaa.gov

7. **Archiving Data Center:**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

8. **Technical Contact:**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

9. **Known Uncorrected Problems:** None.

10. **Quality Statement:** This data set has NOT been thoroughly edited for errors. It is published as received from the National Weather Service's Weather Forecast Offices.

11. **Essential Companion Datasets:** None.

12. **References:** No information provided with original documentation.

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Appendix A

Table 1

FIPS State Codes for the States and the District of Columbia

Alabama	01 AL	Missouri	29 MO
Alaska	02 AK	Montana	30 MT
Arizona	04 AZ	Nebraska	31 NE
Arkansas	05 AR	Nevada	32 NV
California	06 CA	New Hampshire	33 NH
Colorado	08 CO	New Jersey	34 NJ
Connecticut	09 CT	New Mexico	35 NM
Delaware	10 DE	New York	36 NY
DC	11 DC	North Carolina	37 NC
Florida	12 FL	North Dakota	38 ND
Georgia	13 GA	Ohio	39 OH
Oklahoma	40 OK	Oregon	41 OR
Hawaii	15 HI	Pennsylvania	42 PA
Idaho	16 ID	Rhode Island	44 RI
Illinois	17 IL	South Carolina	45 SC
Indiana	18 IN	South Dakota	46 SD
Iowa	19 IA	Tennessee	47 TN
Kansas	20 KS	Texas	48 TX
Kentucky	21 KY	Utah	49 UT
Louisiana	22 LA	Vermont	50 VT
Maine	23 ME	Virginia	51 VA
Maryland	24 MD	Washington	53 WA
Massachusetts	25 MA	West Virginia	54 WV
Michigan	26 MI	Wisconsin	55 WI
Minnesota	27 MN	Wyoming	56 WY
Mississippi	28 MS		

United States Coastal Waters and Great Lakes: (added by Stuart Hinson, NCDC for Storm Data purposes only)

81	LC	LAKE ST CLAIR
82	PS	AMERICAN SAMOA WATERS
83	PM	PACIFIC ISLAND WATERS
84	PH	HAWAII WATERS
85	GM	GULF OF MEXICO
86	PZ	PACIFIC OCEAN
87	AM	CARIBBEAN SEA AND TROPICAL ATLANTIC
88	AN	ATLANTIC OCEAN
89	PK	ALASKA WATERS
90	LH	LAKE HURON

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91	LM	LAKE MICHIGAN
92	LS	LAKE SUPERIOR
93	SL	ST LAWRENCE RIVER
94	LO	LAKE ONTARIO
95	LE	LAKE ERIE

FIPS State Codes for the Outlying Areas of the United States,
the Freely Associated States, and Trust Territory

American Samoa	60	AS	1
Federated States of Micronesia	64	FM	3
Guam	66	GU	1
Marshall Islands	68	MH	3
Northern Mariana Islands	69	MP	1
Palau	70	PW	4
Puerto Rico	72	PR	1
U.S. Minor Outlying Islands	74	UM	2
Virgin Islands of the U.S.	78	VI	1

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