NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

# Storm Data FAQ Page

### How to receive information regarding changes, system maintenance and delays?

Please register your email address.

### When does data become available?

Due to the amount of time it takes to collect, validate, and enter post Storm Data information, the National Centers for Environmental Information (NCEI) regularly receives Storm Data from the National Weather Service (NWS) approximately 75 days after the end of a data month. (Ex: The January data month is usually available on or around April 15th)

The NWS has 60 days to submit their data files to the NWS Headquarters in Silver Spring, MD. The NWS Headquarters (NWSHQ) then collects all of the data files from the 123 NWS Forecast Offices. The NCEI receives a copy of this database approximately 75 days after the end of the month. A publication and archive are produced and the Storm Events Database are updated within 75-90 days after the end of a data month.

### Where does the data come from?

NCEI receives Storm Data from the National Weather Service. The National Weather service receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public, among others.

### How accurate is the data?

Storm Data Disclaimer:

Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in Storm Data may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Therefore, when using information from Storm Data, customers should be cautious as the NWS does not guarantee the accuracy or validity of the information. Further, when it is apparent information appearing in Storm Data originated from a source outside the NWS (frequently credit is provided), Storm Data customers requiring additional information should contact that source directly. In most cases, NWS employees will not have the knowledge to respond to such requests. In cases of legal proceedings, Federal regulations generally prohibit NWS employees from appearing as witnesses in litigation not involving the United States.

### How are the latitude and longitudes determined?

Storm Data information is entered into the database in two ways:

1. As a distance in miles and a direction on 16-point compass scale from a known location, usually a town or city. Example: 4.5 miles ESE Atlanta. The NWS uses a database of over 106,000 cities and towns including their latitudes and longitudes. Using an algorithm, the location 4.5 miles ESE of Atlanta can be derived from the known latitude and longitude of Atlanta. These latitude and longitude pairs are generated by the NWS and populated into the database. The latitude and longitude are in Decimal Degrees format.

OR

2. By entering the latitude and longitude directly. The range, azimuth and nearest city/town are calculated from the latitude and longitude.

### How accurate are the latitude and longitude locations?

Storm Data has gone through many changes and versions over the years. The source data ingested into the database are widely varied and leads to many questions about the precision and accuracy of the location data.

**1950 to 1995: Tornado Data from the Storm Prediction Center**

**1959 to 1995: Thunderstorm Wind and Hail Data from the Storm Prediction Center**

These data were collected by the National Weather Service through the years listed and placed in the Climatological National Summary from 1950-1980 and the Storm Data Publication from 1959-1995.

The latitude and longitude were imported in degrees and minutes (ddmm) resolution then converted to Decimal Degrees for the Storm Events Database DD.dd. The accuracy (1 minute) is approximately 1 mile at 38 degrees north latitude or +/- 1/2 mile from the tornado track beginning and ending points. Thunderstorm Winds and Hail usually consist of a single point.

**1996 to 09/2006: Storm Data (from Paradox 7.0 Database)**

All point data were entered by the National Weather Service (NWS) Forecast Office Warning Coordination Meteorologist (WCM) into the Storm Data database entry program StormDat. While entering the data into the database, the entry person could use the Range (in hundredths of miles) and Azimuth (in 16-point compass bearing) from the nearest city/town/location (from a table containing > 103,000 entries. The latitude and longitude were calculated from the supplied range and azimuth and recorded in the same precision as above (ddmm).
*Example: 2.75 miles ESE Asheville, NC = lat 3535 x lon -8230*

**10/2006 to Current: Storm Data (from Windows SQL Server database csv dump)**

Similar to above, the data were entered by the WCM for each Forecast Office in the NWS, however the precision and accuracy were increased. The WCM could enter the latitude and longitude in decimal degrees to the ten thousandths (DD.dddd) which is within 5-10 meter (15-30 feet) accuracy and the location is calculated or the location information is entered (Range, Azimuth, Location) and a latitude and location is calculated. In October 2007, the NWS implemented a Google Maps interface to enter event locations by clicking on the Google Map interface to generate a latitude and longitude value the ten-thousandths place (DD.ddddd) after the decimal, representing the beginning and ending locations of the event.

### How are the damage amounts determined?

The National Weather Service makes a best guess using all available data at the time of the publication. The damage amounts are received from a variety of sources, including those listed above in the Data Sources section. Property and Crop damage should be considered as a broad estimate.

### Why is there no lightning strike information?

At this time, the only lightning data contained within Storm Data are lightning events that result in fatality, injury and/or property and crop damage. These events are reported to the NWS for inclusion into the Storm Events Database. If you need information on actual lightning strikes, please review the Lightning Summary Data provided by NCEI. Reports of actual strike locations can be purchased from the owners of the various lightning detection networks.

### How are tornadoes counted?

Tornadoes may contain multiple segments. A tornado that crosses a county line or state line is considered a separate segment. Also, a tornado that lifts off the ground for less than 4 minutes or 2 miles is considered a separate tornado segment. If the tornado lifts off the ground for greater than 4 minutes or 2 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments. For official tornado counts by state, please use the monthly counts at the Storms Prediction Center Tornado Data.

---

### Other information:

An Episode is an entire storm system and can contain many different types of events.

An Event is an individual type of storm event. (Thunderstorm Wind, Hail, Tornado and Flood are events)

When listing wind speed values under Magnitude, Ex. 81 kts., the value listed is can be either estimated by damage caused, or measured by official NWS approved calibrated anemometers. 1 kt. = 1.152 mph. (Measures Gust, Measured Sustained, Estimated Gust or Estimated Sustained)

When listing hail size under Magnitude, ex. 2.25 in, the hail size is given in inches and hundredths of inches. These values are assigned a size in inches from their appearance.

---

**Approximate Hail Size:**

| Appearance | Approximate Size in Inches |
|---|---|
| Pea | 0.25 - 0.50 inch |
| Penny | 0.75 inch |
| Nickel | 0.88 inch |
| Quarter | 1.00 inch |
| Half Dollar | 1.25 inch |
| Walnut/Ping Pong | 1.50 inch |
| Golf ball | 1.75 inch |
| Hen Egg | 2.00 inch |
| Tennis Ball | 2.50 inch |
| Baseball | 2.75 inch |
| Tea Cup | 3.00 inch |
| Grapefruit | 4.00 inch |
| Softball | 4.50 inch |

---

**The Enhanced F-Scale (EF-Scale):**

Please refer to the simple wind speed and damage table or detailed documentation at the NOAA Storm Prediction Center.

---

When listing property and crop damage, the figures indicated are the best guess made by the NWS from the available sources of information at the time of the printing.

The fatalities, injuries, and damage amounts appearing in tropical cyclone events are attributed only to wind damage experienced in the coastal counties/parishes listed. Other tropical cyclone related events such as tornadoes and flooding are listed within their separate event types.

### The Saffir-Simpson Scale

Category One Hurricane:

Winds 74-95 mph (64-82 kt or 119-153 kph). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.

Category Two Hurricane:

Winds 96-110 mph (83-95 kt or 154-177 kph). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.

Category Three Hurricane:

Winds 111-130 mph (96-113 kt or 178-209 kph). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large tress blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Flooding near the coast destroys smaller structures with larger structures damaged by battering of floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.

Category Four Hurricane:

Winds 131-155 mph (114-135 kt or 210-249 kph). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the hurricane center. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).

Category Five Hurricane:

Winds greater than 155 mph (135 kt or 249 kph). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.