

The Storm Chaser

A Publication of the National Weather Service Cleveland and Skywarn

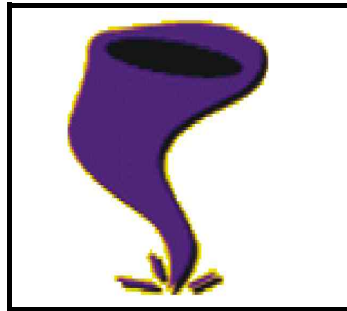
Fall 2006

Severe Weather Season In Review

The 2006 severe weather season got off to a slow start, but this was certainly not an indication of

what was to come.

Only a few severe weather episodes occurred during March, April and the first half of May. The second half of May was much more active with several large



severe weather episodes. A steady stream of severe weather then continued through the end of July. The third week of June was extremely active with tornadoes, large hail, damaging winds and devastating flooding all reported. Several historic flash flooding episodes occurred during the course of the summer. Northern Ohio and Northwest Pennsylvania got a well deserved break from severe weather and flooding in August and September.

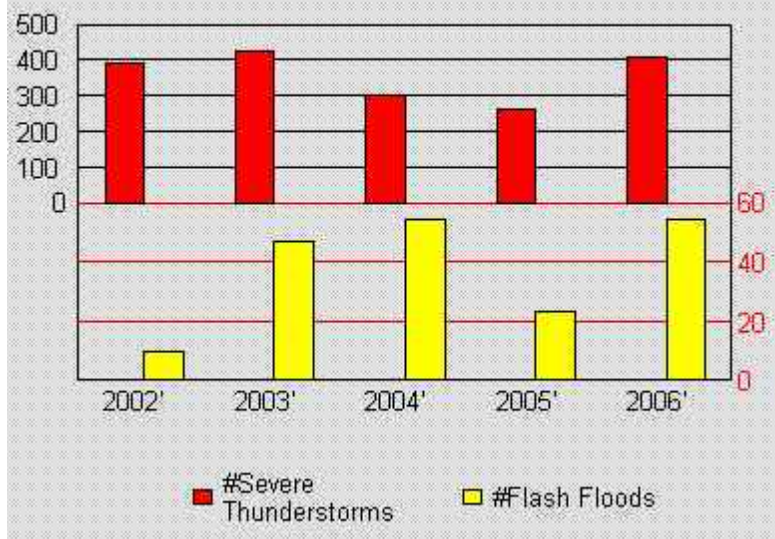
The first severe weather of the season occurred on March 10th and 13th when two strong low pressure systems brought high winds to the region. Relatively large severe weather episodes followed on April 7th and 12th when 67 severe weather reports were received.

The afternoon and evening hours of May 25th featured numerous severe storms. Hail up to an inch and a half diameter, or walnut size, was reported in Wayne County. Also in Wayne County, a funnel cloud was tracked for several minutes between Smithville and Easton. Winds estimated between 80 and 100 miles per hour swept through Clyde in

Sandusky County destroying a concrete block building and tearing roofs off of several other buildings. Many other counties across the area experienced severe weather ranging from downed trees to quarter size hail. Only a few days later on the 31st, flash flooding took place in Cuyahoga and Geauga Counties. A portion of Interstate 90 just west of Cleveland had to be closed during the evening rush hour.

The period from June 19th through the 22nd was the most active part of the severe weather season. During this period, devastating flash flooding took place across the region and in some locations was the worst in decades. On June 19th, damaging winds and hail were reported throughout northern Ohio and northwestern Pennsylvania. Another round of severe weather arrived during the afternoon hours of the 21st. Winds estimated to be at least 75 miles per hour destroyed a hangar

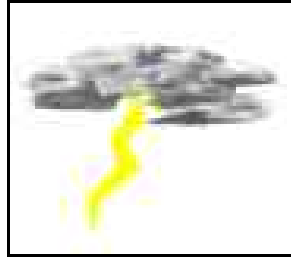
Severe Weather Comparison



and twelve planes at the Wood County Airport in Bowling Green. Significant flash flooding developed during the evening hours of the 21st

and continued into the 22nd. Rainfall amounts of up to 7.25 inches fell in the Toledo area where roads turned into rivers.

Hundreds of vehicles became stranded in the flood waters and travel in portions of Toledo was nearly impossible. Flash flooding conditions spread to other counties through the overnight hours with Ottawa,



Wood, Erie, Lorain, Crawford, Seneca and Huron Counties affected. In Huron County, the City of Norwalk was hard hit as almost seven inches of rain fell in just a few hours. By the morning of the 22nd, the city was split in half with only one north-south road remaining open. Flood conditions continued to worsen in Norwalk during the daylight hours of the 22nd as runoff from the heavy rains continued to flow into the city. Flood waters on some streets were reported to be as much as 12 feet deep. Thousand homes sustained damage from flooding in northern Ohio on the 21st and 22nd. Local officials stated that this was the worst flooding in the area since July 4th, 1969.

Just as many people across the region were assessing the storm damage from the day before, severe thunderstorms redeveloped during the early afternoon hours of the 22nd. Winds from the storms were strong enough to blow over three semi trucks in Wyandot County. Several homes were damaged by thunderstorm winds in Knox County. In Ashland County, downburst winds created a damage path from Charles Mills Lake to near Hayesville with winds estimated to be at least 80 miles per hour. Approximately a thousand trees were downed by this downburst, and one house was damaged enough to declared uninhabitable. In Wayne County, the city of Wooster experienced so many downed trees and power lines that many roads had to be closed. It took several days for power to be completely restored.

Three tornadoes touched down in Holmes and Stark Counties during the afternoon of June 22nd. In Holmes County, a F2 tornado touched down just west of Mt. Hope and tracked through Winesburg. Numerous homes were heavily damaged along the tornado path. One home had its second floor completely destroyed. Several buildings at a nearby factory were also heavily damaged. A few minutes later, a F1 tornado touched down in Stark County just west of Brewster and tracked east to near Navarre. Several houses were heavily damaged along with twelve mobile homes. A few of the mobile homes were completely destroyed. Finally, a third tornado touched down just east of East Sparta shortly before 6 p.m. This F1 tornado moved east through downtown Waynesburg damaging several buildings. Tree damage along all three tornadoes tracks was extensive. Damage from these tornadoes was estimated to be around \$2.5 million.

More flooding was reported on the 22nd as heavy rains once again fell on the area. In Cuyahoga County, several cities including Brecksville, Broadview Heights, Parma, North Royalton, and Solon were hard hit by flooding. Four to six inches of rain fell on these cities in just a couple hours. Some streets had as much as two to three feet of water flowing on them. Thousands of homes were damaged. The Cuyahoga River at Independence established a new record high level during this event at 23.2 feet. Damage caused by flooding in eastern Cuyahoga County alone was estimated to be \$35 million.

Severe weather and flooding events occurred on a regular basis through the end of July. During the afternoon of July 4th, a round of severe weather occurred with two F0 tornadoes touching down in Portage County. One of the tornadoes touched down near Deerfield and caused major damage to a barn. About a week later on July 10th, severe thunderstorms moved across the region and caused a tornado to develop along the Richland and Ashland County line near Pleasant Hill Lake. The tornado tracked into Mohican

State Park and downed hundreds of trees. A barn and grain elevator were also leveled along the damage path. Also on the 10th, nearly eight inches of rain fell on southern Ashland, northern Knox and northwestern Holmes Counties during the late afternoon and early evening hours. The Mohican River quickly rose and caused a four foot wall of water to race down the river. People canoeing on the river were forced to climb trees to save themselves from the raging waters. Up to 700 campers had to be evacuated from campgrounds along the river. Numerous buildings and homes in the area were severely damaged by the flooding.

The month of July concluded with unprecedented flooding across northeast Ohio on the evening of the 27th and early morning hours of the 28th. Lake County was the hardest hit, but flooding extended into eastern Cuyahoga, Ashtabula and Geauga Counties. Heavy rains fell on Northeast Ohio during the late afternoon and early evening hours of the 27th. After a brief lull for much of the evening, the heavy rains moved back into the area toward midnight causing flash flooding to quickly redevelop. A total of 5 to 9 inches of rain fell on the area. On the morning of the 27th, the Grand River at Painesville was running at about 2 feet. Twenty four hours later, the river level climbed to an all time record of 17.36 feet. Hundreds of homes were flooded and roads and bridges were washed out. Dozens of private boats broke away from docks along the river and were also washed out into the lake. Hundreds of people were evacuated from their homes because of flooding and dozens more had to be rescued by helicopters. The damage caused by this event was estimated in the hundreds of millions of dollars.

August was a much quieter month across the area with only a few severe weather episodes. A weak

tornado damaged a few businesses in Knox County on August 3rd. On the 19th, a severe thunderstorm passed over southwest Crawford County Pennsylvania. Severe winds with this thunderstorm downed several hundred trees near the Pymatuning State Park. Several homes were damaged. Most of this was roof damage caused by fallen trees, but a couple homes also had chimneys toppled. Spotters indicated that one tree was uprooted and then thrown nearly 30 feet from its original location.

The 2006 severe weather season will go into the books as being an active year, especially for flash flooding. Some of the flooding events that occurred this past season

have been classified as 100 year events, and the flooding across Lake County on July 27th and 28th has been tentatively classified as a 500 year event. A total of seven tornadoes occurred this year which is just below the normal for the region. Reports of severe winds and hail were also common this year. However, this season will most likely be remembered for the flash flooding that devastated portions of the area in June and July.

Move to Storm-Based Warnings Gains Momentum

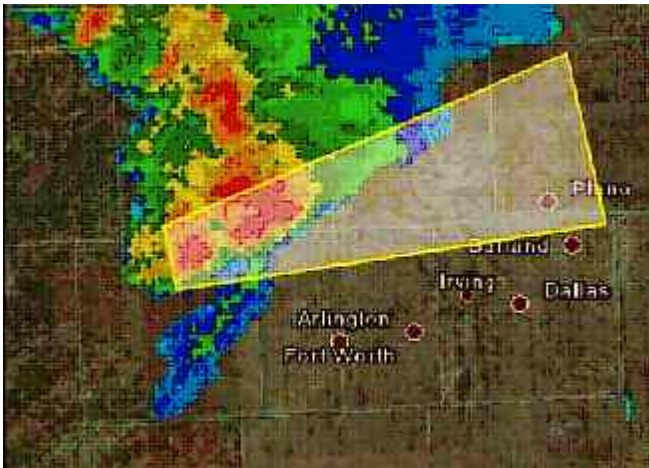
Warnings for tornadoes, severe thunderstorms and flash floods are some of the most important products issued by the NWS. Currently, these warnings include entire counties even though the risk of severe weather may only affect a small portion of a county. In some instances, large segments of the population are needlessly warned to take shelter from the storm. The size of a warning can be especially problematic in larger counties.

2006 Tornadoes

Date	County	Fujita Scale
06/22/06	Holmes	F2
06/22/06	Stark	F1
06/22/06	Stark	F1
07/04/06	Portage	F0
07/04/06	Portage	F0
08/03/06	Knox	F0

To resolve this problem, NWS is moving to smaller, “stormbased” warnings, also called “polygon” warnings. The storm-based system will allow the NWS to warn small portions of one or more counties, warning only those in the path of the storm. Forecasters will determine the storm-based warning by a set of latitude and longitude points easily ingested by graphical applications such as Geographic Information Systems.

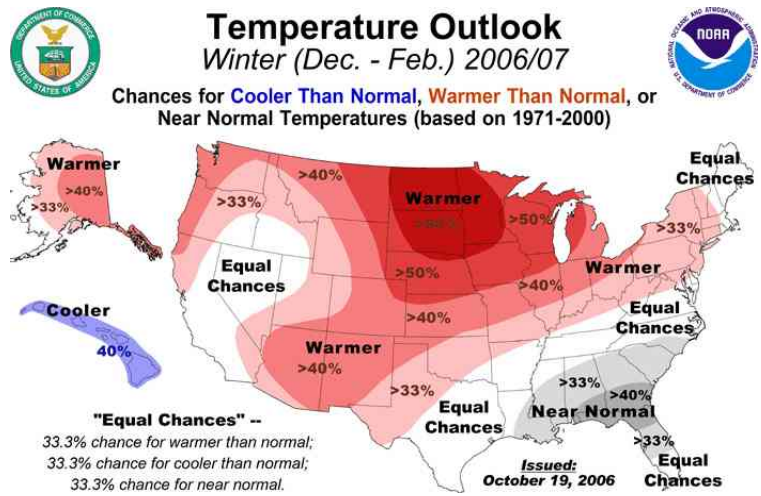
During 2005, several NWS Weather Forecast Offices tested the use of these smaller-than-county areas for convective warnings. The results were positive. Offices taking part in the test averaged a reduction of 70 percent in the area covered by warnings. Emergency management and other disaster response agencies served by these warnings were able to focus limited resources on smaller areas. Forecasters reported the ability to communicate severe weather threats to the public with increased specificity and



clarity.

2006 - 2007 Winter Outlook

Meteorologists at the NOAA Climate Prediction Center released the latest seasonal outlook, which reiterates this winter is likely to be warmer than the 30-year norm (1971-2000) over much of the nation, yet



cooler than last year's very warm winter season. NOAA's heating degree day forecast for December, January and February projects a two percent warmer winter than the 30-year average but about eight percent cooler than last year. Although there has been early season snowfall in Buffalo and wintry weather in the upper Midwest and Rockies this fall, NOAA's seasonal meteorologists say there is not much correlation between fall weather and the winter season.

The precipitation outlook calls for wetter-than-average conditions across the Southwest from central and southern California to Texas and for Florida and the south Atlantic Coast. Drier-than-average conditions are favored in the Ohio Valley, the northern Rockies and Hawaii. Other regions have equal chances of drier, wetter or near average precipitation.

NOAA Weather Radio News

A new NOAA Weather Radio transmitter has become operational in Northeast Ohio. Station WNG-735 in New Philadelphia, Ohio is broadcasting on a frequency of 162.425 Mhz.



The broadcast for this transmitter originates from NOAA National Weather Service Pittsburgh, PA.,

but coverage from this transmitter does include some of the NOAA National Weather Service Cleveland area of responsibility. These counties include Stark, Holmes and Wayne.

Severe Weather Awareness Weeks

The following are the dates for the Ohio and Pennsylvania Severe Weather Awareness Weeks for 2007. Skywarn will staff the National Weather Service office in Cleveland for the Ohio Statewide Tornado Test. Check in's from all amateur radio stations are encouraged.

Ohio Severe Weather Awareness Week

March 25th-31st, 2007

Ohio Statewide Tornado Test

March 28th at 9:50 am

Pennsylvania Severe Weather Awareness Week

March 11th-17th, 2007

Pennsylvania Severe Weather Test

March 15th, 2007

Skywarn Training 2007

All training this year will be conducted in March, April, May and the first week of June. Please have three potential dates in mind when you call. Also, class sizes must be 25 individuals or greater. Classes will be offered Monday through Thursday. If planning an evening class, a **6:00 PM** or **6:30 PM** start time is preferred. **Please ensure a screen is available.** We are trying to consolidate classes. Please coordinate with other interested groups. Because



of resources, we must limit the number of visits to each county to one or two. Large groups and Emergency Management Agencies (EMA) get schedule priority. We will require that all talks be coordinated with your local EMA. Schedule the training early and promote the talk. You will get much better attendance. To schedule a Skywarn training session you should do the following:

1. Coordinate with the County EMA
2. Ensure at least 25 people (Give an estimate of attendance)

Have a **location, date** and **time** established!

4. Provide me with a volunteer to help with registration.
5. Call Gary Garnet at 216-265-2382 ext 223 or Email at gary.garnet@noaa.gov to schedule training.

Skywarn spotters are required to update training every two to three years. Spotters who do not update their training will be removed from the Skywarn program. The training schedule for Skywarn will be posted on our web page www.weather.gov/cle in the Skywarn section.

Are you interested in the weather for fun and education? Attend a meeting of the Northeast Ohio Chapter of the American Meteorological Society (NEOCAMS).

We meet at various locations throughout northeast Ohio including Kent State University and the National Weather Service Office at Cleveland Hopkins International Airport. Most meetings are held on Saturday mornings at 11 AM and are announced a month or so in advance. If you are interested in learning more or getting on our email list, contact Jim Kosarik at "James.Kosarik@noaa.gov".



Ashland County Flooding
July 10th, 2006

photo courtesy Skywarn



Lorain County Shelf Cloud
June 19th, 2006

photo courtesy Skywarn

Medina Shelf Cloud
July 19th, 2006



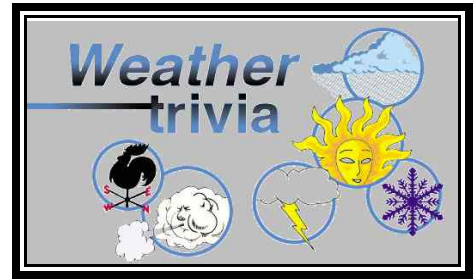
photo courtesy Russ Ring

Lake County Flood Damage
July 2006

photo courtesy Lake Co.



Visit us on the Web at:
<http://www.erh.noaa.gov/cle>



1. **What is the wind chill temperature if the temperature is 0 degrees and the wind speed is 20 miles and hour?**

- a) -15 degrees
- b) -19 degrees
- c) -22 degrees
- d) -29 degrees

2. **The LEAST amount of snow for a winter season in Erie, Pennsylvania?**

_____ Akron	a. 37.6 inches	a) 19.6 inches
_____ Cleveland	b. 45.4 inches	b) 30.4 inches
_____ Erie	c. 47.9 inches	c) 38.6 inches
_____ Mansfield	d. 55.0 inches	d) 42.1 inches
_____ Toledo	e. 63.3 inches	
_____ Youngstown	f. 86.1 inches	

3. **Match the annual average snowfall with the city?**

4. **The definition of a Severe Thunderstorm?**

- a) 50 mph winds and \geq 3/4 inch hail
- b) 58 mph winds or \geq 3/4 inch hail
- c) 50 mph wind and \geq 1/2 inch hail
- d) 60 mph winds or 3/4 inch hail

5. **What is the county average 12 hour snowfall needed for the NWS in Cleveland to issue a Winter Storm Warning?**

- a) 2 inches
- b) 4 inches

c) 6 inches

d) 8 inches

6. The snowiest winter on record in Cleveland, Ohio occurred in which season?

a) 1977-78

b) 1995-96

c) 2002-03

d) 2004-05

Thank You For Your Support!!!!

Answers to Trivia Questions:

1. c) -22 degrees
2. a) 19.6 inches in 1932-33
3. c, e, f, b, a, d
4. b) 58 mph or hail \geq 3/4
5. c) 6 inches
6. d) 117.9 inches in 2004-05