



## New Marine Zone Configuration for the Niagara River

The Niagara River runs about 36 miles in length and is the connecting hydrologic channel from Lake Erie into Lake Ontario. Approximately half-way between Lakes Erie and Ontario, Niagara Falls is located on the Niagara River—a drop of about 175 feet. Thus, the Falls makes the river non-navigable from one end to the other.

The Upper Niagara River is only accessible for navigation from Lake Erie while the only access to the Lower Niagara River is from Lake Ontario. The Upper Niagara River contains fifteen to twenty access sites to the river. Marine observations are available from equipment located at the Buffalo Coast Guard station located in Buffalo Harbor. The Lower Niagara River has fewer access sites since much of it (about seven miles) is a deep gorge. Marine observations are available from equipment located at the Niagara Coast Guard station in Youngstown. In spite of the smaller number of access sites, the lower Niagara River hosts similar numbers of recreational boaters as the upper Niagara River. This includes an annual sailing race (The Levels) at the mouth of the river drawing hundreds of boats from the U.S. and Canada.

Because much of the Lower Niagara River (about seven miles) is a deep gorge and then “opens” below the Niagara escarpment, wind and wave conditions are very different from the Upper Niagara River. Wind directions that can result in rough waters on the river are nearly 180 degrees out of phase be-



tween the upper and lower sections.

The NWS Forecast Office in Buffalo is now issuing two forecasts for the Niagara River. The Upper Niagara River and Buffalo harbor zone will end at Niagara Falls (LEZ020). The new Lower Niagara River zone will extend from Niagara Falls downstream to Lake Ontario (LOZ030).

## Storm Reports Via Twitter

Through an experimental program, the National Weather Service will be searching for tweets that contain **significant** weather information.

### Why Twitter?

An advantage of searching Twitter for weather reports is the capability to utilize recently added "geotagging" -- geographical information that is associated with something, in this case individual Tweets. This allows the NWS to correlate each Tweet to its location when it was sent. This capability will help to enhance and increase timely and accurate online weather reporting and communication between the public and their local weather forecast offices. The reports will be carefully evaluated during the experiment to ensure quality and timeliness.

### Who Can Participate?

Anyone with a Twitter account can participate. **Note: Trained storm spotters should use pre-established communication methods, when possible, to send severe weather reports to the NWS.**

### Here's What You Need to Do:

**If Geotagging is available** on your 3rd party Twitter application:

Make sure geotagging is turned on for your 3rd party Twitter app. Make sure geotagging is turned on for your Twitter account page. Submit your Tweet report via your 3rd party app in the following format:

**#wxreport *your significant weather report***

**If Geotagging is NOT available** on your 3rd party Twitter application (or you want to use the web-based Twitter.com): Log into your Twitter account via the web or mobile device. Submit your tweet report in the following format:

**#wxreport WW *your location* WW *your significant weather report***

**Your location** can be just about anything, but the more specific the better. Here are some examples listed from most accurate to least accurate location identification:

### What You Can Report

You can tweet any weather event that occurs in your local area, but we are **most interested in significant events**: snowfall, severe weather, flooding, etc. In particular:

- Damage from winds--briefly describe what was damaged and time it occurred.
- Hail--include size of hail and time it fell.
- Tornadoes or funnel clouds.
- Flooding--briefly describe what is occurring.
- Snowfall during an event and storm total. When reporting snowfall, include the time period when it fell.
- Freezing rain or freezing drizzle producing a 'glaze' on objects or roads.
- Dense fog restricting visibility to less than a half mile.

More information about Twitter reporting can be found at:

<http://www.weather.gov/stormreports/>

# Thunderstorm and Lightning Safety

## Before the Storm...

- Develop a plan for you and your family for home, work, school, and when outdoors.
- Have frequent drills.
- Know the county or parish in which you live and the names of nearby major cities. Severe weather warnings are issued on a county or parish basis.
- Check the weather forecast before leaving for extended periods outdoors.
- Watch for signs of approaching storms.
- If a storm is approaching, keep a NOAA Weather Radio or AM/FM radio with you.
- Postpone outdoor activities if thunderstorms are imminent. This is your best way to avoid being caught in a dangerous situation.
- Check on those who have trouble taking shelter if severe weather threatens.

## When Thunderstorms Approach...

- Remember: if you can hear thunder, you are close enough to the storm to be struck by lightning. Go to safe shelter immediately!
- Move to a sturdy building or car. Do not take shelter in small sheds, under isolated trees, or in convertible automobiles.
- If lightning is occurring and a sturdy shelter is not available, get inside a hard top automobile and keep windows up.
- Get out of boats and away from water.
- Telephone lines and metal pipes can conduct electricity. Unplug appliances not necessary for obtaining weather information. Avoid using the telephone or any electrical appliances. Use phones ONLY in an emergency.
- Do not take a bath or shower.
- Turn off air conditioners. Power surges from lightning can overload the compressors.
- Get to higher ground if flash flooding or flooding is possible. Once flooding begins, abandon cars and climb to higher ground. Do not attempt to drive to safety. Note: Most flash flood deaths occur in automobiles.

## If Caught Outdoors and No Shelter Is Nearby...

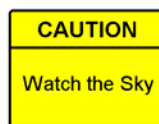
- Find a low spot away from trees, fences, and poles. Make sure the place you pick is not subject to flooding.
- If you are in the woods, take shelter under the shorter trees.
- If you feel your skin tingle or your hair stand on end, squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them. Make yourself the smallest target possible, and minimize your contact with the ground.
- If you are boating or swimming, get to land and find shelter immediately!

## The 30/30 Rule of Lightning Safety

30 Seconds: Count the seconds between seeing the lightning and hearing the thunder. If this time is 30 seconds or less, then the lightning is close enough to be a threat. Seek shelter immediately.



30 Minutes: After seeing the last lightning flash, wait 30 minutes before leaving shelter. More than half of lightning deaths occur after the thunderstorm has passed. Stay in a safe area until you are sure the threat has passed.



### WATCH

Conditions are favorable for severe weather in or near the watch area. Watches are issued for tornadoes, severe thunderstorms and flash floods.



### WARNING

The severe weather event is imminent or occurring in the warned area. Warnings are issued for tornadoes, severe thunderstorms, flash floods and river flooding

## April 2011 Tornado Information

### April 26-28, 2011 Tornado Outbreak Statistics

NOAA's preliminary estimate is that there were 312 tornadoes during the entire outbreak from 8:00 a.m. EDT April 26 to 8:00 a.m. April 28, 2011.

- During the 24-hour period from 8:00 a.m. EDT April 27 to 8:00 a.m. EDT April 28, The National Weather Service (NWS) estimates there were a total of 226 tornadoes.
- The NWS Storm Prediction Center issued severe weather outlooks five days in advance and tornado watches hours in advance.
- NWS Weather Forecast Offices issued life-saving tornado warnings, with an average lead-time of 24 minutes. NWS issued warnings for more than 90 percent of these tornadoes.
- NWS decision support for this event has been extensive. NWS Weather Forecast Offices in the affected areas of Arkansas, Tennessee, Mississippi, Alabama and Georgia advertised the potential for severe weather in the Tuesday through Wednesday time-frame since late last week. Local offices provided direct decision support services to meet the specific needs of local emergency manager partners and the general public. NWS Weather Forecast Offices issued Hazardous Weather Outlooks up to six days in advance noting the greater threat of strong, long-track tornadoes was expected.
- The largest previous number of tornadoes on record in one event occurred from April 3-4, 1974, with 148 tornadoes.

Expert analysis by NOAA Research and the National Weather Service of the fatality information indicates that at least 344 people were killed during the entire outbreak from 8:00 a.m. EDT April 26 to 8:00 a.m. April 28. There were 334 fatalities during the 24-hour-period from 8:00 a.m. April 27 to 8:00 a.m. April 28.

- This is the most people killed by tornadoes in a two-day period since April 5-6, 1936, when 454 people were killed, mostly in Tupelo, Mississippi, and Gainesville, Georgia.
- This is the deadliest single day for tornadoes since the March 18, 1925, tornado outbreak that had 747 fatalities across 7 states (including the Tri-State Tornado).
- The Tuscaloosa-Birmingham tornado during the April 2011 event caused at least 65 fatalities.
  - These are the most fatalities from a single tornado in the United States since May 25, 1955, when 80 people were killed in a tornado in southern Kansas with 75 of those deaths in Udall, Kansas.
  - The deadliest single tornado on record in the United States was the Tri-State tornado (Mo., Ill., Ind.) on March 18, 1925, when 695 died.

- Note: All numbers are based on combined NOAA and historical research records and current fatality estimates. The historical research records extend back to 1680.

### Month of April 2011 (and record monthly) Tornado Statistics

NWS's preliminary estimate is that there have been more than 600 tornadoes thus far during the month of April 2011.

- The previous record number of tornadoes during the month of April was 267 tornadoes set in April 1974.
- The previous record number of tornadoes during any month was 542 tornadoes set in May 2003.
- The average number of tornadoes for the month of April during the past decade is 161.
- The overall monthly average number of tornadoes for the past decade is 106.

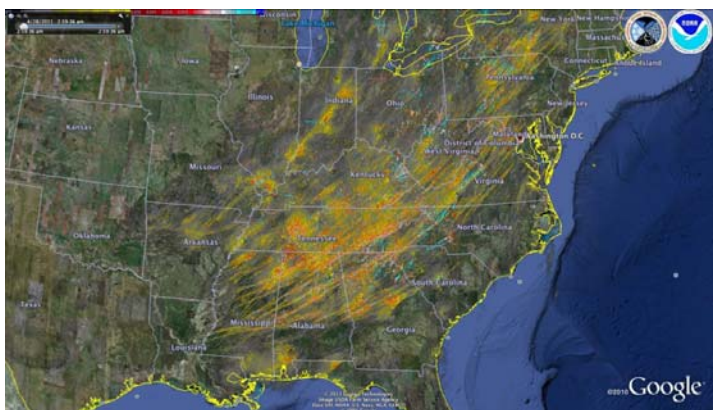
### 2011 Year-to-Date (and record annual) Statistics

NWS's preliminary estimate is that there have been 881 tornadoes so far this year.

- The previous yearly record number of tornadoes was set in 2004 with 1,817.
- May is historically the most active month for tornadoes.
- The overall yearly average number of tornadoes for the past decade is 1,274.

NWS and NOAA have created a webpage that will be updated with the latest information as it comes in:

[http://www.noaanews.noaa.gov/april\\_2011\\_tornado\\_information.html](http://www.noaanews.noaa.gov/april_2011_tornado_information.html)



National Severe Storms Laboratory image of tornado outbreak storm rotation tracks. Bright reds, oranges and yellows show tracks of where rotation was strongest as detected by NWS Doppler radars.



## Flash Flood Safety

### When you receive a Flash Flood Warning: Go to higher ground Climb to safety!

- Get out of areas subject to flooding. This includes dips, low spots, canyons, washes, etc.
- Avoid already flooded and high velocity flow areas. Do not attempt to cross flowing streams.
- If driving, be aware that the roadbed may not be intact under flood waters. Turn around and go another way. NEVER drive through flooded roadways!
- If the vehicle stalls, leave it immediately and seek higher ground. Rapidly rising water may engulf the vehicle and its occupants and sweep them away. Remember, it's better to be wet than dead!
- Be especially cautious at night when it is harder to recognize flood dangers.
- Do not camp or park your vehicle along streams and washes, particularly during threatening conditions.

### During the flood:

- Avoid areas subject to sudden flooding.
- If you come upon a flowing stream where water is above your ankles, STOP! Turn around and go another way.

- Do not attempt to drive over a flooded road. The depth of water is not always obvious. The roadbed may be washed out under the water, and you could be stranded or trapped.
- Children should NEVER play around high water, storm drains, or viaducts.

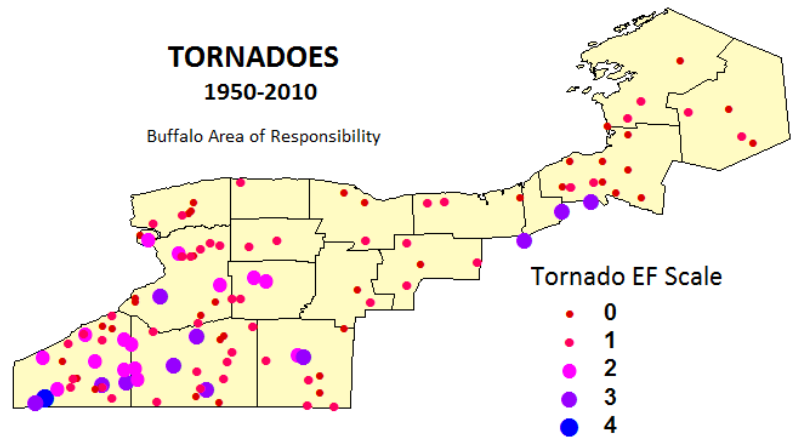
### After the flood:

- If fresh food has come in contact with flood waters, throw it out.
- Boil drinking water before using. Wells should be pumped out and the water tested for purity before drinking. If in doubt, call your local public health authority.
- Seek necessary medical care at the nearest hospital. Food, clothing, shelter, and first aid are available from the Red Cross.
- Do not visit disaster areas. Your presence might hamper rescue and other emergency operations.
- Electrical equipment should be checked and dried before being returned to service.
- Use flashlights, not lanterns, torches or matches, to examine buildings. Flammables may be inside.
- Report broken utility lines to appropriate authorities.

## Tornado Safety

### If a Warning is issued or if threatening weather approaches:

- In a home or building, move to a pre-designated shelter, such as a basement.
- If an underground shelter is not available, move to an interior room or hallway on the lowest floor and get under a sturdy piece of furniture.
- Stay away from windows.
- Get out of automobiles.
- Do not try to outrun a tornado in your car; instead, leave it immediately.
- Mobile homes, even if tied down, offer little protection from tornadoes and should be abandoned.
- Occasionally, tornadoes develop so rapidly that advance warning is not possible. Remain alert for signs of an approaching tornado. Flying debris from tornadoes causes most deaths and injuries.



The above map marks all of the tornadoes that have occurred in the Buffalo NWS Area of Responsibility from 1950 through 2010. A total of 115 tornadoes have occurred during those 61 years. While only one was ranked an F4 on the Fujita Scale, these tornadoes resulted in 5 deaths and 44 injuries. Total property damage from these storms is estimated near 60 Million dollars.

Some awesome satellite / flyover before and after images of Tuscaloosa, Alabama are available on the web at:

<http://www.noanews.noaa.gov/stories2011/pdfs/NOAA%20Tuscaloosa%20Flyover%20Low-Res.pdf>

# Winter 2010-2011 Summary

A big THANK YOU to all of our Cooperative Observers, CoCoRaHS, SKYWARN and other volunteer spotters for all their efforts and observations this past winter.

The winter of 2010-2011 was a very deep and consistent one. It was not particularly long, starting after Thanksgiving and petering out about on schedule in late March and early April. The winter was remarkably consistent with very few thaws. Total snowfall was above normal just about everywhere (the exception on the tug hill) but not substantially so. This was due to the high frequency of the snowfalls rather than the size of any storms. Snow covered the ground just about the entire period from early December through mid-March with just a few brief breaks. All four cold weather months (December through March) averaged colder than normal.

It was the coldest and snowiest winter overall across our region in eight years (since 2002-03). Nearly all of the snow through January was of the lake effect variety, while virtually all of it in February and March was synoptic.

There were eight lake effect "events" – two fewer than average. The most disruptive event of the winter was actually the intense narrow lake effect storm which smothered Buffalo's immediate southeast suburbs with up to three

feet on December 1 and featured a very tight gradient leaving much of the city and areas north of the airport with little or no snow at all. The flow tended west to northwest through the rest of December and January favoring the Rochester area with a number of moderate falls in December (enough to give them their snowiest December in history) and Oswego county with intense snows in January.

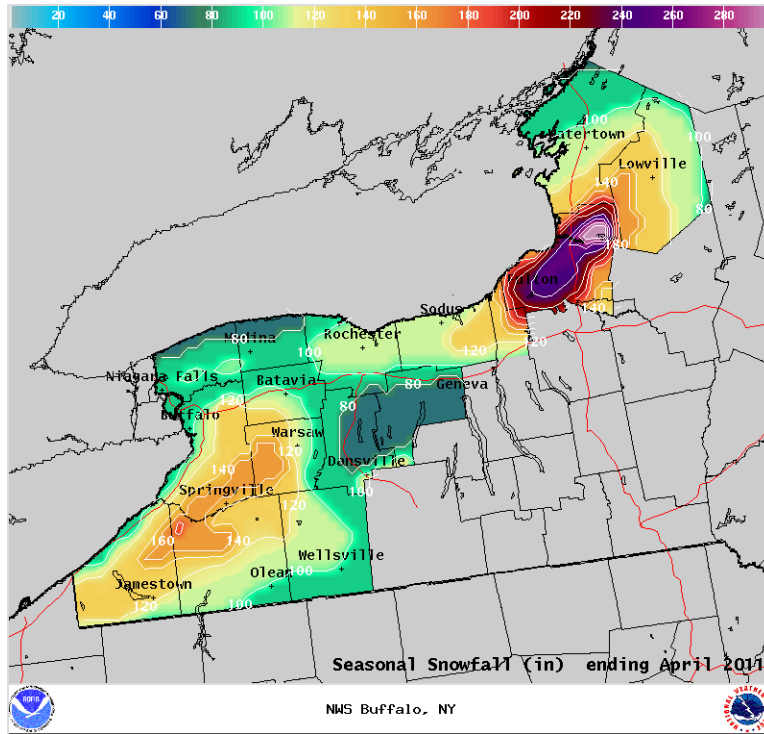
The pattern relaxed a bit in February with the synoptic storm track setting up over our region, giving several moderate falls area-wide. There were two more snow events in March as well. April saw little snow but was excessively wet and cloudy. It was the wettest April ever in Rochester and Watertown.

The heaviest season snowfall was actually over Oswego county rather than the tug hill due to the more northwesterly flow. Higher elevations of the Chautauqua ridge did quite well in the west and

all areas, including the Buffalo and Rochester metro areas, had above normal snowfall. Again, this was not due to major storms, just the incredible frequency of minor falls.

Specific snowfall amounts by location and more details can be found on our website at:

<http://www.weather.gov/buf/snowsummary1011.html>



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**EDITORS NOTE:**

Published bi-annually, each of issue of "The Lake Breeze" contain articles about our operations, products and services, and interesting weather submitted by various members of our staff and NOAA Headquarters. If you have a comment about our programs, or an idea for something you'd like to see included in an upcoming issue, we'd like to hear from you. You can email me at [judith.levan@noaa.gov](mailto:judith.levan@noaa.gov).

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