NORTHEASTERN STORM BUSTER

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FEATURES

DEPARTMENTS

Northeastern StormBuster is a quarterly publication of the National Weather Service Forecast Office in Albany, New York, serving the weather spotter, emergency manager, cooperative observer, ham radio, scientific and academic communities, along with weather enthusiasts, who all have a special interest or expertise in the fields of meteorology and/or climatology. Original content contained herein may be reproduced only when the National Weather Service Forecast Office at Albany, and any applicable authorship, is credited as the source.

YET ANOTHER MAY 29TH
SEVERE WEATHER EVENT

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As many of you might recall, our County Warning Area (CWA) of 19 eastern New York and adjacent western New England counties experienced a fairly big severe weather event on May 29th of last year. Well, we had one this May 29th as well, and it was very interesting how it evolved.

The Storm Prediction Center (SPC) had our area in a "Slight Risk" outlook for severe thunderstorms for the 29th, beginning several days prior to the event. On Wednesday, May 29th, a warm front began to lift north into the region. Showers and a few rumbles of thunder preceded the warm front early in the day. This was followed by peaks of sunshine. Initially, there were no thunderstorms; in fact, more debris clouds filled in, obscuring the sun at times. By late afternoon, the warm front had lifted across our northern zones, with a secondary boundary draped across the Capital Region. This secondary boundary was what is often referred to as a “differential heating boundary”, commonly set up on the border between areas of cloud cover and sunshine. The Capital Region was positioned right in the vicinity of this boundary, with a moist and unstable air mass just to the south. The upper levels of the atmosphere further aided in increasing the chances for thunderstorms, as an upper-level 75-mph jet set up just to our north, making our region favorable for moderate ascent, and a resulting destabilization of the atmosphere. Additionally, a potent upper-level disturbance worked its way over the region toward the evening hours, with still further destabilization (Figure 1).

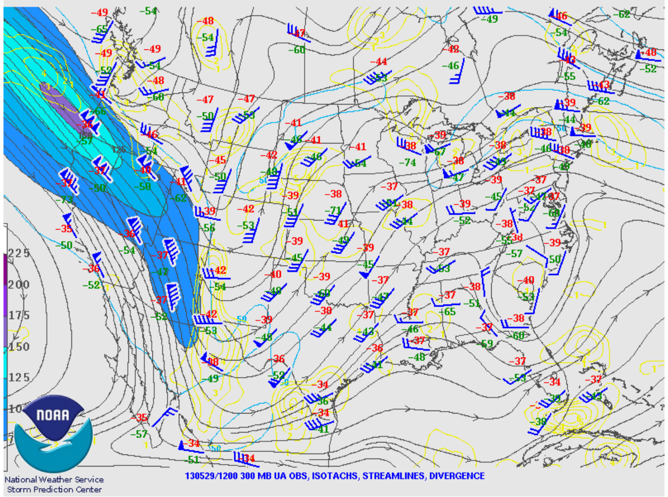

Figure1. Upper-level setup for May 29, 2013.

Thunderstorms began to fire up along a Lake Ontario sea breeze front between 3 and 4 pm. The National Weather Service offices in Buffalo and Binghamton had warned on a few cells that quickly became severe, including issuing a Tornado Warning for Otsego County. These thunderstorms continued to progress eastward, riding along the differential heating boundary. A few cells worked their way into our western areas, and Severe Thunderstorm Warnings were issued for large hail. Meanwhile, a secondary line of cells erupted, with more warnings being issued upstream of our CWA. These storms combined and formed a bow echo that raced down the Mohawk River valley, with widespread reports of wind damage. The damage was so bad that, at one point, all the available firefighters in southern Herkimer County were dispatched to attend to it.

As the bow echo approached the Greater Capital District, a supercell formed in eastern Montgomery County ahead of it (Figure 2). This supercell quickly generated intense rotation that resulted in the first tornado in the area since September 4, 2011. This tornado was rated as an EF2 (estimated maximum winds of 125 mph), with a nearly 13 mile path length of up to a mile in wide (Figure 3). It not only caused considerable structural damage between Florida in Montgomery County and Schenectady in Schenectady County, but it also caused one injury when a man had to be pulled from his collapsed barn in Mariaville Lake. This tornado was the strongest in our region since July 21, 2003.

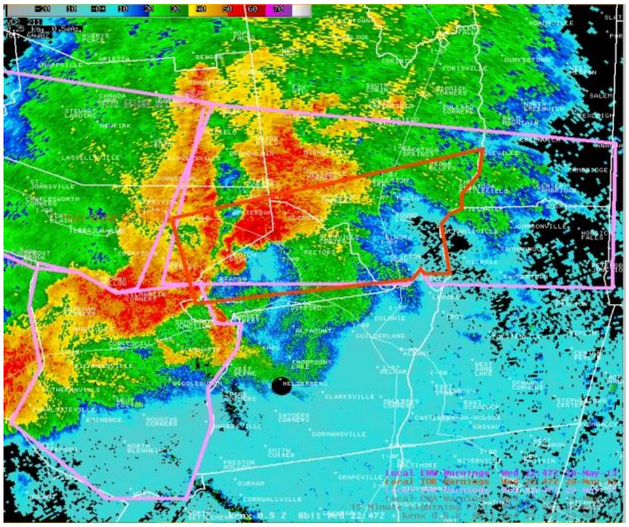

Figure 2. Supercell and bow echo that helped spawn the EF2 tornado in Montgomery and Schenectady Counties.

Figure 3. Montgomery and Schenectady County EF2 tornado track.

There were two other tornadoes: one that touched down near Jefferson in Schoharie County, producing significant tree damage, and ranked as an EF1 (estimated maximum winds of 100 mph). The third tornado was confirmed near Vischer Ferry in southern Saratoga County, with, again, mainly tree damage. The last time our region had three or more tornadoes in one day was on July 21, 2003.

As the tornadoes dissipated, the bow echo transformed into a Mesoscale Convective Vortex (MCV), characterized by a wall of wind (WOW) that continued to cause widespread damage across the

Capital District, Mid-Hudson Valley, and portions of western New England. The brunt of the severe weather occurred between 6 and 8 pm, impacting the tail end of the rush hour. The wind from the storms disrupted power to more than 20,000 customers, some of whom were without power for more than a day.

Torrential rains produced extremely heavy rainfall within a short time, which resulted in spotty flash flooding throughout the region. Several Flash Flood Warnings were also issued. One off-duty National Weather Service meteorologist reported nearly two inches of rain in just 25 minutes!

While our office actually dodged the worst of the storm, the sky turned a nasty charcoal black, and the visibility at the office briefly dropped to near zero. In that short time, the road outside seemed to turn into a river. The lightning was also very intense, with frequent cloud-to-ground strikes brightening the dark sky.

Our County Warning Area has historically experienced a large number of severe weather events during the end of May into early June. On May 31, 1998, an EF3 tornado ripped through Mechanicville, destroying many homes and businesses. Severe thunderstorms peppered most of eastern New York and adjacent Western New England. On May 29, 1995, three people were killed near the Great Barrington Fairgrounds when their vehicle was lofted into the air by an EF3 tornado that also destroyed the fairgrounds. Last year on May 29th, thunderstorms with strong winds and large hail caused damage across portions of the region. Severe weather events were recorded on May 31st of 2001, 2002, 2006, 2007 and 2008. Luckily, there were no fatalities, and there was just one injury, from this latest powerful severe weather event.□

THE MAY 29, 2013
EASTERN NEW YORK TORNADOES

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The National Weather Service (NWS) at Albany conducted damage surveys on May 30th and June 1st, confirming three tornadoes that occurred on May 29, 2013 across eastern New York. Collectively, the three tornadoes affected portions of Montgomery, Schenectady, Schoharie and Saratoga Counties late that afternoon.

The first of these was a long-path tornado that touched down at 6:47 p.m. EDT in the town of Florida, situated on the border of Montgomery and Schenectady Counties. This tornado continued on towards the east-southeast for 13 miles across most of Schenectady County before ending near the corner of Campbell Avenue and Broadway at Hillhurst Park, located in the city of Schenectady, at 7:04 p.m. EDT. The tornado had a narrow path at the beginning of its track in the town of Florida near Scotch Bush. There, trees were uprooted, and part of a roof was torn off a home near the intersection of Bernaski Road and NY Route 30. There was a distinct zigzag pattern found in the farm fields across from a home on Bernaski Road, indicative of a possible multi-vortex tornado. A farmhouse near the intersection of Route 30 and Merry Road had a 100+ year old barn destroyed (**Figure 1**), with several trees snapped and uprooted in different directions, and cars damaged.

The damage was more impressive and widespread in Schenectady County, where the tornado was around a mile wide at times, with EF1 to EF2 damage. Extensive damage was observed from NY Route 159. Numerous hardwood and softwood trees were toppled, uprooted or sheared. Schenectady County Emergency Management brought the survey team to 451 South Shore Rd. in Mariaville, where a well-built 200 x 70 foot horse barn was almost completely leveled. A person sustained a serious head injury trying to seek shelter under the stairs of an adjoining barn. This horse barn was located right near Mariaville Lake, where debris (i.e. siding and shingles) was hanging from power lines. An eyewitness claimed to have seen the funnel cloud overhead. A four-wheel all-terrain vehicle (ATV) was moved about 100 feet from its original location, and a tree was snapped and tossed over 40 feet from its base. The house at 451 South Shore Rd. was slightly shifted off its foundation. A pickup truck was severely damaged with a 2 x 4 board impaled in its side (**Figure 2**). Debris from the roof of the barn was scattered as far as over a half mile away, and was seen in the yards of homes along Route 159. Impressive damage was viewed along Route 159 and North Kelley Street, where five high-tension power line towers were mangled and destroyed by the tornado. The survey team was able to see heavy damage sustained by three of the towers. One of them was twisted and crushed from the tornado (**Figure 3**). The damage from the tornado extended for nearly a dozen miles in Schenectady County. It was determined that it crossed Interstate 90 along Putnam Rd. in Rotterdam. The damage was predominately EF1 and EF0 from Putnam Rd. to its endpoint in Hillhurst Park.

Based on the damage observed from the Montgomery and Schenectady County tornado, estimated maximum wind speeds were 125 mph. This classified the tornado as a solid EF2. The operational Enhanced Fujita Scale is a set of wind estimates based on degree of damage. This tornadic damage scale was modified from the old Fujita Scale by a team of meteorologists and engineers, and was implemented on February 1, 2007. The EF scale ranges from 0 to 5, and has estimated 3-second wind gust ranges in miles per hour (mph). An EF0 has winds of 65-85 mph, and an EF1 has winds of 86-110 mph. An EF2 has estimated 3-second wind gusts of 111-135 mph. Estimates of the damaging gusts are based on the subjective judgment of the survey team on 8 levels of damage to 28 structural and vegetative indicators. More information on the EF Scale, and the transition from the old Fujita Scale, can be found at the following website: http://www.ncdc.noaa.gov/oa/satellite/satelliteseye/educational/fujita.html.

Two shorter path length tornadoes touched down in Schoharie and Saratoga Counties. An EF1 tornado hit Summit and East Jefferson between 6:57 p.m. and 7:02 p.m. EDT. The estimated maximum wind speeds were 100 mph, with an estimated path width of 200 yards, and a path length of 1.6 miles. A brief touchdown occurred along a ridge line in East Jefferson. The damage swath from the woods was seen from the juncture of Dutch Hill and Wharton Hollow Roads with the assistance of a local fire department chief. Dozens of hardwood and softwood trees had fallen in different directions, and were sheared off (**Figure 4**). The fire chief explained that fallen trees from the tornado were removed from Enid and Baptist Church Roads. The team was taken to Baptist Church Road, and they saw several trees uprooted, having fallen in different directions. The tornado appeared to have begun in Summit, and there was no damage to structures, nor were there any injuries or fatalities from it. A damage survey was undertaken on June 1st in Schenectady and Saratoga Counties by NWS Albany Warning Coordination Meteorologist Steve DiRienzo. An EF1 tornado occurred in Vischer Ferry in Saratoga County, with estimated maximum wind speeds of 100 mph, a path width of 200 yards, and a path length of nearly a mile. The tornado occurred at 7:10 p.m. EDT, and the damage was concentrated near the intersection of Riverview Rd. and Willow Spring Drive. The damage included: a roof ripped off a well-built shed (**Figure 5**); windows blown out of a home; a barn slightly shifted off a foundation, and; approximately 100 hardwood and softwood trees snapped, sheared off and uprooted. There were no injuries or fatalities from the tornado.

The Albany forecast area averages two to three tornado events each year based on a tornado climatology mean period from 1950-2010. The Montgomery-Schenectady County tornado was the first EF2 tornado since the F2 tornado on July 21, 2003 that struck Kiskatom and Catskill in Greene County in the Albany County Warning Area that covers east-central New York and western New England. This was a long-track supercell on a convective line that had a tornado with a path that went into Columbia, Rensselaer, and Bennington Counties. The last tornado to touch down in Montgomery and Schenectady counties was in Cranesville and West Glenville on September 4, 2011. This was a significant EF1 tornado that was nearly a half mile wide at times. Another, brief, EF0 tornado touched down near Auriesville in Montgomery County on September 22nd of that year. Montgomery County has had nine tornadoes since January 1, 1950. This was only the 4th tornado to strike Schenectady County since the beginning of the 1950s! One tornado occurred on August 21, 1971, when an F0 hit part of the county. The 2nd of the four Schenectady County tornadoes occurred on June 24, 1960. This significant F3 tornado touched down just east of the city of Schenectady, and moved northeast nearly 11 miles into southeastern Saratoga County, where it dissipated south of Round Lake. That long-track Greater Capital Region tornado produced nine injuries, and damage totaling approximately $25 million. The length of the May 29th EF2 was very comparable to the historic June 24th one.

Figure 1: Barn destroyed at the corner of Bernaski Rd. and NY Route 30. This barn was over 100 years old.
Photo Source: NWS Albany

Figure 2: Truck destroyed at 451 South Shore Rd. in Mariaville. A wooden board was driven into the truck below the rear windshield.
Photo Source: NWS Albany

Figure 3: A high-tension power line tower destroyed (one of five severely damaged along this stretch). This was seen from NY Route 159 and North Kelly Road.
Photo Source: NWS Albany

Figure 4: Extensive tornado tree damage viewed along a ridge line in Schoharie County from the junction of Dutch Hill and Wharton Hollow Rds.
Photo Source: NWS Albany

Figure 5: Significant shed damage about 100 yards south from Riverview Road.
Photo Source: NWS Albany□

SKYWARN SPOTTER SAFETY

Brian Montgomery
Senior Meteorologist, NWS Albany

The recent devastating tornadoes that resulted in a loss of trained spotters in Oklahoma are a reminder of just how vulnerable we are to severe weather. This past SKYWARN training season, we placed an emphasis on personal safety, and wanted to remind our SKYWARN Spotters of some key points concerning personal safety.

Per SKYWARN directive (NWSI 10-1807):
Safety is the top priority for SKYWARN Weather Spotters. The National Weather Service does **not** encourage its SKYWARN weather spotters to engage in storm chasing. However, the NWS does recognize that SKYWARN spotters, engaged in mobile activities, may encounter severe weather, and should be alert to rapidly changing weather conditions that could impact personal safety. With copyright permission from Randy Denzer and Joshua Jans of the Spotter Network.org, the NWS has adopted the **ACES** safety concept. ACES stands for **A**wareness, **C**ommunication, **E**scape Routes, and **S**afe Zones. All NWS SKYWARN Weather Spotters should follow safety guidelines:

- Awareness means spotters are constantly observing the weather situation around them. This type of observation is commonly referred to as “situational awareness”. Continuously monitoring the risks around you can save your life, especially in rapidly changing weather conditions. Knowing that there is a river crossing, or observing that the street is lined with power poles and trees, can help you prepare for the hazards of severe weather. When you are aware of the imminent threats, and you are thinking ahead about possible outcomes, you can better position yourself to minimize these threats.
- Communicating your whereabouts to others on a regular basis, and having multiple lines of communication available can help keep you and others safe from hazards.
- Escape Routes are vital when you are entering a potentially dangerous area. As part of awareness, always have more than one escape route, and make sure you know the safest and quickest way to get to them.
- If rapidly changing circumstances prevent you from getting to your escape routes, find your closest safe zones or shelters. These are the areas where you will be safest if you need to quickly get to a shelter. Knowing where these locations are will limit your risk.

10 Golden Spotter Safety Rules

Rule Number 1.
ALWAYS operate with your safety as the number one priority.
A. The spotter’s personal safety is to be the primary objective of every spotter.
• The information provided by the spotter is critical for public safety, and the spotter should maintain the ability to provide that information.
• The spotter should not perform any act that would jeopardize his or her own personal safety or that of another individual.
B. Timely and **accurate** reports aid in the personal safety of oneself and others, which is the overall goal of the SKYWARN spotter program.

Rule Number 2.
ALWAYS obey any and all directives from public safety, law enforcement and emergency management officials.

Rule Number 3.
ALWAYS adhere to the concept of **ACES** at all times.

Rule Number 4.
ALWAYS activate emergency services.
Mobile and stationary spotters should activate emergency services BEFORE making a weather report when faced with incidents that have caused injuries to civilians. Spotters should notify emergency officials (911, local dispatch, law enforcement) by phone, HAM radio or other means, prior to making a weather report. Note that it is unsafe to use a corded phone during a thunderstorm. Only after emergency services have been activated can a weather report be submitted.

Rule Number 5.
NEVER place yourself in a position where you can be overrun by, or unprotected from, a storm.

Rule Number 6.
ALWAYS be aware of overhead obstructions or objects that could become a safety concern during a storm.

Rule Number 7.
NEVER enter a flooded roadway or area for any reason, whether on foot or in a vehicle.
"Turn around, don't drown".

Rule Number 8.
ALWAYS treat all downed power lines as if they are energized at all times. Stay safely away.

Rule Number 9.
ALWAYS obey all state, federal, and local traffic laws and regulations. AND practice defensive and safe driving techniques, especially at night and during inclement conditions.

Rule Number 10.
ALWAYS proceed safely when operating alongside of roadways.

Our SKYWARN network is a vital part of the warning decision process within the NWS as we work together to save lives! If you have any additional questions, please contact our Warning Coordination Meteorologist, Mr. Steve DiRienzo.□

SPRING 2013:
COOL, DRY START; MILD, WET END

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The Spring of 2013 started off looking like it would be slightly cool and dry, but once May settled in, the heat and rainfall had arrived, balancing out early and mid-spring, and resulting in no seasonal records. The 46.5º mean for the season in Albany was only a half a degree below normal. The departures of the means of both the highs and lows for the season were very consistent with the departure of the average mean, also being a half a degree below normal (Table 1). March 2013 was 1.2º cooler than normal for March, and April was 1.9º cooler than the normal for April; with May winding up 1.6º milder than normal for that month. There were no temperature records of any kind for either March or April, while a new daily low maximum record was established on May 25th, replacing the previous record, from 1967, by a 4 degree margin (Tables 3a-c). The highest recorded temperature for the month was 92º, on the very last day of Climatological Spring (May 31st). It was the only 90+ degree event day of the entire season, and it tied a 1937 record for the date. These two temperature records represented all there were for the season. The low temperature recorded for the season was 11º, on March 21st (Table 1). The last freeze occurred on May 15th.

March precipitation totaled 2.49" in Albany, 0.72" below normal for the month; April was almost identical. Then May came in with a whopping 6.65" total, almost double the normal amount for that month (Table 1). Like for temperatures, March and April of 2013 also produced no precipitation records for Albany. There were four calendar days this spring where there was an inch or more of precipitation, and all of these occurred in the month of May. One of these was a new daily record; 1.15" fell on the 22nd, replacing the old record for the date of 0.91", from way back in 1883. May made it into the Top 10 Wettest Mays, at number 9. It was also Albany's 82nd-wettest month of all-time (Table 3c). We had a significant 6-day wet spell in May, which ran from the 21st to the 26th, and produced a total of 4.50" (Table 2b).

Snowfall was impressive in March, with a total of 19.5", averaging almost double the normal for the month in Albany (Table 1). The spring total snowfall was 20.7", 8.1" above normal. The season's only snowfall record was a daily record on the 8th; 6.5" was received, which broke the 6.2" record for the date from 2005 (Table 3a). The snow season ended with a trace event on April 20th (Table 2b).

Of the 12 records established during the spring season, half were wind records. There were 5 daily maximum wind speed records broken or tied in April, plus 1 in May (Tables 3b and 3c). Because these wind records go back to only 1987, this is not an unusual situation. The peak wind gust for the season occurred May 29th (one of the records); 53 mph was recorded at Albany International Airport in a thunderstorm (Table 4c). The windiest date was March 14th; the average speed for the day was 17.7 mph. April 23rd was the calmest day, with an average speed of 2.3 mph. (Table 4b). Tables 4a-c reveal that there were a total of 8 days with thunderstorms. The only hail recorded at the airport all season, on April 1st, was without thunder.

STATS

	MAR	APR	MAY	SEASON
Avg. High/Dep. From Norm.	42.0°/-2.4°	56.9°/-1.4°	71.9°/+2.5°	56.9°/-0.5°
Avg. Low/Dep. From Norm.	25.6°/-0.1°	34.9°/-2.4°	47.8°/+0.7°	36.1°/-0.6°
Mean/ Dep. From Norm.	**33.8°/-1.2°**	**45.9°/-1.9°**	**59.9°/+1.6°**	**46.5°/-0.5°**
High Daily Mean/date	44.5°/12th	60.5°/30th	77.5°/31st	
Low Daily Mean/date	22.5°/21st	31.0°/2nd	42.5°/13th	
Highest reading/date	56°/31st	74°/28th	92°/31st	
Lowest reading/date	11°/21st	25°/2nd & 3rd	32°/15th	
Lowest Max reading/date	31°/3rd & 14th	37°/2nd	47°/25th	
Highest Min reading/date	36°/11th, 12th, 28th & 29th	50°/29th	66°/23rd	
Ttl. Precip./Dep. Fm. Nrm.	**2.49”/-0.72”**	**2.47”/-0.70”**	**6.65”/+3.04”**	**11.61”/+1.62”**
Ttl. Snowfall/Dep. Fm.Nrm.	**19.5”/+9.3”**	**1.2”/-1.1”**	**0.0”/-0.1”**	**20.7”/+8.1”**
Maximum Precip./date	0.81”/12th	0.70”/10th	1.31”/21st	
Maximum Snowfall/date	6.5”/8th	1.2”/2nd	0.0”/--	

Table 1

NORMALS, OBSERVED DAYS & DATES

NORMALS & OBS. DAYS	MAR	APR	MAY	SEASON
NORMALS				
High	44.4°	58.3°	69.4°	57.4°
Low	25.7°	37.3°	47.1°	36.7°
Mean	**35.0°**	**47.8°**	**58.3°**	**47.0°**
Precipitation	**3.21”**	**3.17”**	**3.61”**	**9.99”**
Snow	**10.2”**	**2.3”**	**0.1”**	**12.6”**
OBS TEMP. DAYS				
High 90° or above	0	0	1	0/92
Low 70° or above	0	0	0	0/92
High 32° or below	2	0	0	2/92
Low 32° or below	27	14	1	42/92
Low 0° or below	0	0	0	0/92
OBS. PRECIP DAYS				
Days T+	22	21	14	57/92/62%
Days 0.01”+	10	14	12	36/92/39%
Days 0.10”+	6	5	8	19/92/21%
Days 0.25”+	4	3	6	13/92/14%
Days 0.50”+	3	2	6	11/92/12%
Days 1.00”+	0	0	4	0/92/4%

Table 2a

NOTABLE TEMP, PRECIP & SNOW DATES	MAR	APR	MAY
90º+ Event	-	-	31st (92º)
Last Freeze	-	-	15th (32º)
1.00”+ value/date	-	-	1.31”/21st
1.00”+ value/date	-	-	1.15”/22nd
1.00”+ value/date	-	-	1.07”/24th
1.00”+ value/date	-	-	1.10”/29th
Significant Wet Spell/Dates	-	-	4.50”/21st-26th
Major Snow Event/Date(s)	9.6”/7th-8th	-	-
Major Snow Event/Date(s)	8.3”/18th-19th	-	-
Last Snowfall	-	20th (Trace)	-

Table 2b

RECORDS

ELEMENT	MARCH	
Daily Maximum Snowfall Value/Date | Previous Record/Year	6.5”/8th	6.2”/2005

Table 3a

ELEMENT	APRIL	
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	45 mph/NW/1st	44 mph/W/2002
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	47 mph/W/2nd	43 mph/W/2008
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	40 mph/NW/3rd	40 mph/SE/2005 (tie)
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	46 mph/S/7th	38 mph/NW/1994
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	41 mph/SE/18th	37 mph/W/1994

Table 3b

ELEMENT	MAY	
Daily Maximum Precipitation Value/Date | Prev. Record/Year	1.15”/22nd	0.91”/1883
Daily Low Maximum Temp. Value/Date | Prev. Record/Year	47°/25th	51°/1967
Daily Max. Wind Speed Value/Dir./Date | Prev. Rec./Dir./Yr.	53 mph/ NW/29th	44 mph/ NW/1998
Daily Maximum Temperature Value/Date | Prev. Record/Year	92°/31st	92°/1937 (tie)
Top Ten Wettest Mays Value/Rank | Remarks	6.65”/#9	-
200 All-Time Wettest Months	6.65”/#82	-

Table 3c

ELEMENT	SPRING	
none	-	-

Table 3d

MISCELLANEOUS

MARCH

Avg. wind speed/Dep. Fm. Norm.	9.2 mph/-0.5 mph
Peak wind/direction/date	43 mph/WNW/14th
Windiest day avg. value/date	17.7 mph/14th
Calmest day avg. value/date	3.0 mph/26th
# Clear days	2
# Partly Cloudy days	16
# Cloudy days	13
Dense fog dates (code 2)	8th & 19th
Thunder dates (code 3)	none
Sleet dates (code 4)	19th
Hail dates (code 5)	none
Freezing rain dates (code 6)	19th

Table 4a

APRIL

Avg. wind speed/Dep. Fm. Norm.	9.0 mph/-0.2 mph
Peak wind/direction/date	52 mph/W/19th
Windiest day avg. value/date	17.0 mph/19th
Calmest day avg. value/date	2.3 mph/23rd
# Clear days	4
# Partly Cloudy days	19
# Cloudy days	7
Dense fog dates (code 2)	1st
Thunder dates (code 3)	9th, 10th & 19th
Sleet dates (code 4)	7th, 11th, 12th & 20th
Hail dates (code 5)	1st
Freezing rain dates (code 6)	11th & 12th

Table 4b

MAY

Avg. wind speed/Dep. Fm. Norm.	6.8 mph/-1.2 mph
Peak wind/direction/date	53 mph/NNW/29th
Windiest day avg. value/date	13.5 mph/25th
Calmest day avg. value/date	3.1 mph/2nd
# Clear days	9
# Partly Cloudy days	13
# Cloudy days	9
Dense fog dates (code 2)	29th
Thunder dates (code 3)	15th, 21st, 22nd, 29th
Sleet dates (code 4)	none
Hail dates (code 5)	none
Freezing rain dates (code 6)	none

Table 4c□

2013 ARCTIC SEA ICE EXTENT

George J. Maglaras
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Trends in Arctic sea ice extent are frequently used as a measure of climate change, especially the summer minimum extent. While changes in weather patterns and ocean currents from one season to the next can cause large variations in the ice extent from year to year, a multi-year trend of increasing sea ice extent is seen as evidence of a cooling climate, while a trend of decreasing sea ice extent is taken as evidence of a warming climate. This article will present the latest maximum Arctic sea ice extent statistics for this past winter, as provided by the National Snow and Ice Data Center. Although winter ice extent variations over the past decade have not been as dramatic as summer ice extent variations, the maximum winter ice extent can provide clues as to what will occur during the summer.

Arctic sea ice extent is defined as an area of sea water where ice covers 15 percent or more of that area. Thus, for any square mile of sea water to be included in the ice extent total, at least 15 percent of that square mile must be covered with ice.

The maximum Arctic sea ice extent during the 2012-13 winter season was reached on March 15, 2013, and was about 5 days later than the average date of the maximum extent. The maximum ice extent on that day was 5.84 million square miles, which was 283,000 square miles below the 1979 to 2000 average, making it the sixth-lowest maximum extent since the satellite record began in 1979.

After the record low minimum Arctic sea ice extent of last summer, there is great interest in what the minimum extent will be this summer. Ice melt thus far this spring has been slower than in 2012 due to colder than normal temperatures over much of the Arctic region. As a result, as of June 16, 2013, the Arctic sea ice extent was about 310,000 square miles greater than on June 16, 2012.

From the Editor's Desk

We have some really good and important articles in this issue; five features from 7 authors. The tornado of May 29th resulted in two co-authored articles for this issue. The first is broader and is an in-depth summary of the day from mostly a meteorological perspective. The second goes a little more in-depth, covering damage extents and locations, and featuring photos of some of the damage observed during official NWS surveys. Our middle offering keeps with the theme of severe summer weather, and discusses safety for our SKYWARN observer community. Then I offer my seasonal climate summary, and we round out the features with a 2013 update on the Arctic Sea ice. A special thanks goes out to our authors, all of whom put forth great effort in getting this information out to our readers. Enjoy the readings…and the summer!□

WCM Words

Steve DiRienzo
Warning Coordination Meteorologist, NWS Albany

Summer arrived on June 21st. As is the case with most years, summer severe weather arrived before the first day of summer. This year we have already had the full spectrum of severe summer weather from thunderstorm hail and wind damage, to flash flooding and tornadoes.

The National Weather Service relies on reports from spotters to verify weather warnings. As mentioned above, The National Weather Service does **not** encourage its SKYWARN weather spotters to engage in storm chasing. Please only report severe weather when it is safe to do so. Do not risk your personal safety or the safety of others.

Many thanks to all our weather spotters for reporting severe weather to the NWS. Your reports make a difference. They help the NWS decide whether or not to issue warnings, help us verify warnings and help citizens and the emergency management community by providing data for disaster assistance.

Here at the National Weather Service, we strive to be the source of unbiased, reliable and consistent weather information. We're here to answer your weather and water questions 24 hours a day, 7 days a week. If you have concerns, please call us. If you have comments on StormBuster, or any of the operations of the National Weather Service, please let me know at Stephen.Dirienzo@noaa.gov.□