NORTHEASTERN STORM BUSTER
Emergency Manager & Storm Spotter Magazine
SKYWARN

Winter, 2012-13 *- VOL. 18, NO. 1*
Evan L. Heller, Editor
Steve DiRienzo, WCM/Contributor
Ingrid Amberger, Webmistress

FEATURES

DEPARTMENTS

OUR REGION WAS SPARED THE WORST FROM SANDY

Hugh Johnson
Meteorologist, NWS Albany

On October 22nd, the 18th tropical system of the year, Sandy, formed south of Jamaica in the Caribbean Sea. It intensified fairly quickly to a Category 2 hurricane as it slammed into portions of Jamaica and Haiti. It then tracked north into southeastern Cuba, after which it weakened to a low-end Category 1 hurricane/high-end tropical storm due to land interaction. It brushed the Bahamas, and its outer bands of rain hit sections of the east coast of Florida, as well as North Carolina. An anomalous ridge of high pressure in the mid-levels of the atmosphere forced the storm to track mainly due north very slowly as its center remained off the southeast coast. Meanwhile, a high amplitude trough was located west of the entire Appalachian chain, with surface high pressure anchored over Hudson Bay and across Newfoundland.

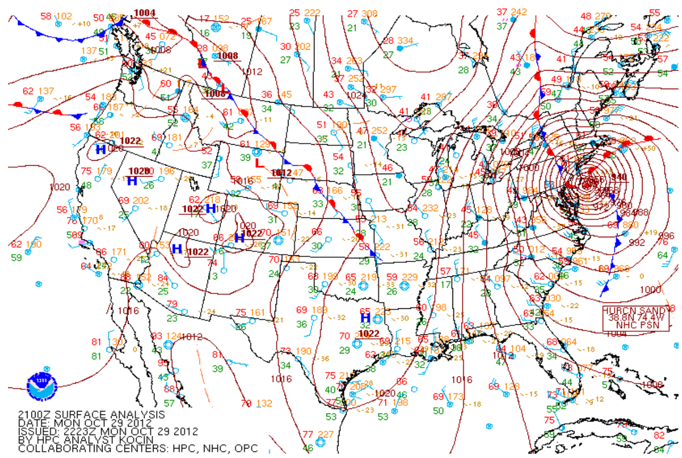
The tropical system continued to track in a mainly northerly fashion from October 26th through the 29th. At the same time, a significant upper-level disturbance, including a very strong jet, took aim toward the Mid-Atlantic States, poised to interact with Sandy. The high to the northeast strengthened, which ultimately prevented Sandy from heading out to sea. As the strong energy from the Mid-Atlantic interacted with Sandy, it pulled Sandy back to the northwest, over the Gulf Stream but well off the Delmarva Peninsula. This is a very unusual track. Sandy actually strengthened, with core winds clocked to 90 mph before it made landfall near Atlantic City, NJ around 800 p.m. EDT on the 29th. At this point, it had lost some of its tropical characteristics but packed a stronger punch than a typical high-end category 1 hurricane would have, due to the fact it had become fully absorbed into the mid-Atlantic system. A few hours prior to landfall, it had a central pressure of only 940 millibars, one of the lowest on record. It became embedded within a very large mid-latitude low pressure area which, in combination with the full moon occurring on the 29th, and the trajectory of the storm approaching from the east southeast, likely contributed to the record storm surge. Once it made landfall, post-tropical system Sandy tracked west northwest across southern Pennsylvania, then turned northward into western New York State on Halloween. It weakened quickly after landfall as dry air in the mid-layers of the atmosphere worked into it.

Unlike Irene, interior eastern New York and adjacent western New England escaped the worst of Sandy's wrath. Nevertheless, record flooding from a tidal surge worked up the Hudson River. The water level at Poughkeepsie crested at 9.54 feet. Tidal flooding was noted all the way north to Albany. Minor flooding occurred in Warren County as water from a strong northerly fetch piled up into the village of Lake George. A few river gages in the Catskills came close to flooding but no points went above flood stage as rainfall amounts were not particularly heavy. In fact, much of the Hudson Valley saw rainfall amounts under an inch due to the valley shadowing created by easterly winds descending down the western flanks of the Berkshires and Taconics, drying out the air. Also, drier air from the Canadian Maritimes was injected into the right side of Sandy, which helped further mitigate rainfall amounts everywhere in our region. The maximum rainfall amounts were a little over 3 inches, in western Greene County.

The winds were forecast to be the worst impact from Sandy. While they did not reach quite the destructive levels as feared or forecast, we did have reported gusts up to 70 mph in our region, mainly across the higher elevations. A trained weather spotter located near Hancock, MA, in the Berkshires, reported the highest wind gust…77 mph. Most of our area had peak wind gusts in the 50-59 mph range. The official high wind gust at Albany International Airport was 49 mph; lower than the peak gust there from Irene. There were minor damage reports of mainly downed trees and wires, especially across the higher elevations and south of Albany, and there were also scattered power outages. There was one storm-related fatality in our forecast area; a woman was killed in Kerhonkson, Ulster County, NY when a large section of roofing blew into her windshield. The worst of the effects of Sandy happened during the late afternoon and evening hours of the 29th. By Tuesday, the 30th, as Sandy was well inland to our southwest, the wind initially decreased, and so did the scattered rain bands.

While our area escaped the very worst of the storm, the central and northern coast of New Jersey was devastated along with portions of New York City, Long Island and even southern New England. The combination of hurricane force wind gusts, and an incredible storm surge of over 12 feet, resulted in over 100 lives being lost there. It will take years, if not decades, to rebuild the homes that were damaged, destroyed or washed out to sea. It will also take some time to assess the total cost of the damage from the storm, but it is already several billions of dollars.

Our thoughts and prayers go out to all of those folks who are still suffering as a result of Sandy.



Surface map depicting Sandy shortly before landfall near Atlantic City NJ

FALL 2012: A LITTLE ABOVE NORMAL

Evan L. Heller
Climatologist, NWS Albany

2012 averaged out to being a fairly typical fall in Albany, New York. The mean temperature for the season was less than one degree above normal (Table 1). September was the closest to normal of the three months, while October was nearly four degrees above, and November, about a degree and a half below, normal. The warmest day of the season was September 7th, with a mean of 75.5°, while November 7th was the coldest, with a mean of 28.5°. The highest temperature recorded for the season was also on September 7th…86°. Several days in November recorded the season's low temperature of 21°, including the 7th. The lowest maximum temperature for the season was 35°, on the 25th of November, and the highest minimum was 68°, on September 4th. Albany's first freeze occurred on October 12th, when the temperature fell to 32°, marking the official end to the growing season, which wound up being 165 days long. The temperature the next morning fell into the 20s.

The only temperature records set during the season at Albany occurred in November (Table 3c); a daily low maximum and a daily low mean, both occurring on the 7th. The low maximum value of 36° tied the record for the date, from 1879. The low mean value of 28.5° broke the 31.0° record from 1962. No months or dates made any of the top temperature lists for the months or the season.

Precipitation totaled 9.98" (Table 1), barely more than a quarter of an inch below normal. September was very wet, with more than 2.4" inches rainfall above normal received. October was much drier, winding up about a quarter inch below normal, and November was driest of all, about as much below normal as September was above. This made the month the 4th-driest November on record at Albany with its precipitation total of just 0.87", also placing it in a 4-way tie for the all-time Top 200 Driest Months, at #83.

September 18th and October 19th each broke the daily precipitation records for their respective dates, and each cracked the list of Top 200 Wettest Precipitation Dates at Albany, at positions 11 and 58, respectively (Tables 3a and 3b). Additionally, September became the 155th wettest month of all-time with its 5.71" total.

The other records for the season were for Daily Maximum Wind Speed, and there were a total of 3 of them, spanning September and October (Tables 3a and 3b). The only measureable snowfall during the Fall of 2012 totaled 0.1", and it occurred on November 7th, marking the official beginning of the Albany snow season, given that these were the first flakes to fall. Cloudy days outnumbered clear days 30 to 11 (Tables 4a-c), and the season's last thunderstorm was recorded on October 20th.

THE STATS

	SEP	OCT	NOV	SEASON
Avg. High/Dep. From Norm.	72.7°/+0.5°	61.5°/+1.7°	46.7°/-1.2°	60.3°/+0.3°
Avg. Low/Dep. From Norm.	52.4°/+0.8°	45.1°/+5.5°	29.5°/-2.0°	42.3°/+1.4°
Mean/ Dep. From Norm.	62.5°/+0.6°	53.3°/+3.6°	38.1°/-1.6°	51.3°/+0.8°
High Daily Mean/date	75.5°/7th	64.0°/3rd	58.0°/12th	
Low Daily Mean/date	51.0°/28th	38.5°/13th	28.5°/7th	
Highest reading/date	86°/7th	74°/5th	67°/12th	
Lowest reading/date	39°/24th	25°/13th	21°/6th, 7th, 18th & 19th	
Lowest Max reading/date	54°/28th	52°/12th & 13th	35°/25th	
Highest Min reading/date	68°/4th	59°/3rd	49°/12th	
Ttl. Precip./Dep. Fm. Norm.	5.71"/+2.41"	3.40"/-0.28"	0.87"/-2.42"	9.98"/-0.29"
Ttl. Snowfall/Dep. Fm.Norm.	0"/-	0"/+/-0"	0.1/-2.7"	0.1"/-2.7
Maximum Precip./date	3.19"/18th	2.28"/19th	0.78"/13th	
Maximum Snowfall/date	-	-	0.1"/7th	

Table 1

NORMALS, OBSERVED DAYS & DATES

NORMALS & OBS. DAYS	SEP	OCT	NOV	SEASON
NORMALS				
High	72.2°	59.8°	47.9°	60.0°
Low	51.6°	39.6°	31.5°	40.9°
Mean	61.9°	49.7°	39.7°	50.5°
Precipitation	3.30"	3.68"	3.29"	10.27"
Snow	0"	0"	2.8"	2.8"
OBS TEMP. DAYS				
High 90° or above	0	0	0	0/91
Low 70° or above	0	0	0	0/91
High 32° or below	0	0	0	0/91
Low 32° or below	0	3	20	23/91
Low 0° or below	0	0	0	0/91
OBS. PRECIP DAYS				
Days T+	12	18	14	40/91/48%
Days 0.01"+	12	14	6	32/91/35%
Days 0.10"+	7	4	1	12/91/13%
Days 0.25"+	4	2	1	7/91/8%
Days 0.50"+	4	1	1	6/91/7%
Days 1.00"+	1	1	0	2/91/2%

Table 2a

NOTABLE TEMP, PRECIP & SNOW DATES	SEP	OCT	NOV
1.00"+ value/date	3.19/18th	2.28"/19th	-

Table 2b

RECORDS

ELEMENT	SEPTEMBER	
Daily Maximum Precipitation Value/Date | Prev. Record/Year	3.19"/18th	1.27"/1987
Daily Max. Wind Speed Value/Dir./Date | Prev. Record/Dir./Yr.	40 mph/W/8th	39 mph/NW/2010
Daily Max. Wind Speed Value/Dir./Date | Prev. Record/Dir./Yr.	40 mph/S/18th	32 mph/NW/1994
200 All-Time Wettest Months Average Value/Rank | Remarks	5.71"/#155	2-Way Tie
200 All-Time Wettest Dates Date/Value/Rank | Remarks	18th/3.19"/#11	3-Way Tie

Table 3a

ELEMENT	OCTOBER	
Daily Maximum Precipitation Value/Date | Prev. Record/Year	2.28"/19th	1.88"/1975
Daily Max. Wind Speed Value/Dir./Date | Prev. Record/Dir./Yr.	37 mph/NW/10th	37 mph/S/1991
200 All-Time Wettest Dates Date/Value/Rank | Remarks	19th/2.28"/#58	2-Way Tie

Table 3b

ELEMENT	NOVEMBER	
Daily Low Max. Temperature Value/Date | Prev. Record/Year	36°/7th	36°/1879
Daily Low Mean Temperature Value/Date | Prev. Record/Year	28.5°/7th	31.0°/1962
Driest Novembers Average Value/Rank | Remarks	0.87"/#4	-
200 All-Time Driest Months Average Value/Rank | Remarks	0.87"/#83	4-way tie

Table 3c

ELEMENT	AUTUMN	
none	-	-

Table 3d

MISCELLANEOUS

SEPTEMBER

Avg. wind speed/Dep. Fm. Norm.	6.2 mph/-0.4 mph
Peak wind/direction/date	40 mph/W/8th & S/18th
Windiest day avg. value/date	13.3 mph/18th
Calmest day avg. value/date	1.3 mph/11th
# Clear days	5
# Partly Cloudy days	19
# Cloudy days	6
Dense fog dates (code 2)	6th, 20th & 27th
Thunder dates (code 3)	8th & 30th
Sleet dates (code 4)	none
Hail dates (code 5)	none
Freezing rain dates (code 6)	none

Table 4a

OCTOBER

Avg. wind speed/Dep. Fm. Norm.	6.1 mph/-1.2 mph
Peak wind/direction/date	43 mph/NE/29th
Windiest day avg. value/date	15.7 mph/29th
Calmest day avg. value/date	0.2 mph/17th
# Clear days	0
# Partly Cloudy days	15
# Cloudy days	16
Dense fog dates (code 2)	3rd-6th, 9th, 17th & 18th
Thunder dates (code 3)	20th
Sleet dates (code 4)	none
Hail dates (code 5)	none
Freezing rain dates (code 6)	none

Table 4b

NOVEMBER

Avg. wind speed/Dep. Fm. Norm.	6.3 mph/-2.1 mph
Peak wind/direction/date	40 mph/W/24th
Windiest day avg. value/date	15.2 mph/24th
Calmest day avg. value/date	0.2 mph/19th
# Clear days	6
# Partly Cloudy days	16
# Cloudy days	8
Dense fog dates (code 2)	27th
Thunder dates (code 3)	none
Sleet dates (code 4)	13th & 30th
Hail dates (code 5)	none
Freezing rain dates (code 6)	30th

Table 4c □

ARCTIC SEA ICE EXTENT: 2012

George J. Maglaras
Senior Meteorologist, NWS Albany

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 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 Arctic sea ice extent statistics.

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.

Based on satellite measurements of Arctic sea ice extent which began in 1979, the average summer minimum Arctic sea ice extent for the period from 1979 to 2000 is 2.59 million square miles. For 2012, the summer minimum extent was reached on September 16, and was 1.32 million square miles, the lowest ever measured by satellite since 1979. The 2012 minimum extent was 49.0 percent below the 1979-2000 average, and 18.0 percent below the previous lowest extent, in 2007.

There has been a noticeable trend of decreasing ice extent since satellites began measuring Arctic sea ice extent in 1979, especially the summer minimum extent. There continues to be concern that global warming may be accelerating the decline of Arctic sea ice, and that the Arctic could be ice-free during the summer months within a relatively short period of time, thereby further accelerating the impacts of global warming.

Although this series of articles does not usually discuss Antarctic sea ice, it is interesting to note that Antarctic sea ice extent was 19.44 million square miles on September 26, the highest ever measured by satellite since 1979. The previous record high was 19.39 million square miles, in 2006.□

AN UPDATE ON OUR UPCOMING WINTER

Hugh Johnson
Meteorologist, NWS Albany

In the fall issue of StormBuster, I talked about the possibility of an El Niño developing during this upcoming winter. An El Niño actually developed during the summer, and some speculated it could be a significant one. However, the El Niño actually weakened during November. As of this writing, the southern Pacific waters were neither warmer nor colder than normal. Therefore, the El Niño-Southern Oscillation (ENSO) was in a neutral phase.

While there is a chance that an El Niño could still re-load, it looks more likely that the ENSO will remain in this neutral phase this winter, referred to as a La Nada. Our last La Nada winter was 2003/04. We started out with two impressive snowstorms in December of that winter. After that, not a whole lot of snow fell during the remainder of the winter. January 2004 was cold, one of our coldest months ever! The chill was often accompanied by wind. In fact, on January 16, 2004, wind chills were so low that most schools were ordered closed.

The La Nada winter of 2001/02, on the other hand, was very mild, and drier than normal. That winter, too, saw one exceptional snowstorm, on January 6th, plus two minor ones. Outside of those, very little snow fell.

The climatic factors that we discussed in the fall issue will probably be the main drivers determining what kind of winter we end up having. High latitude blocking looks more favorable than last year, which means the North Atlantic Oscillation (NAO) might be negative. Last year, the NAO was in a strongly positive phase, which helped keep the Arctic air and most storms north of our region.

The two-year Quasi-Biennial Oscillation (QBO) looks to become negative this winter, which would favor the NAO to be more in the negative phase. Also, the Pacific Decadal Oscillation (discussed in greater detail in the last issue), should remain in the cold phase, again favoring a negative NAO.

One last thing to consider with this upcoming winter is that we will be approaching the maximum period of solar sunspot activity. This is a well-defined 11-year cycle. Theoretically, when the sunspot activity is at a maximum, there might be a tendency for less temperature contrast between the poles and tropical areas, which could mitigate storminess. However, keep in mind that this maximum looks to be a lot less robust than the one in 2001. Also, of all the cycles discussed, this one probably has the least effect on daily weather systems.

The bottom line…whether a La Nada or a weak El Niño, this winter looks to be somewhat colder and snowier than last year's almost non-existent winter.□

COOP CORNER

Timothy E. Scrom
Observing Program Leader

Data, Data and more Data. Where does it come from, how is it used and where does it go?

Data, where does it come from?…The simple answer is that it comes from you: the Cooperative Weather Observer (daily observations); the SKYWARN observer (emergency site-specific weather observations); automated weather stations owned and operated by the National Weather Service (such as at airports); home weather stations operated by private citizens (Citizen Weather Observation Program); pilots (Pilot Weather Reports/PiReps); Road Weather Information systems (you may see some of these weather stations alongside local highways); cooperating federal, state and local government agencies (such as Snow Survey data), and; many more sources too numerous to list.

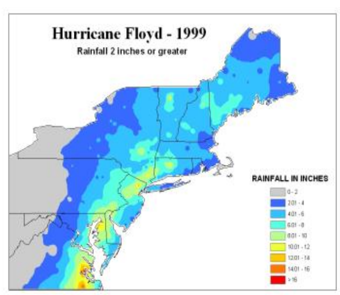

An Automated Fischer Porter Rain Gage

All of this data, and more, feeds into the local forecast office, and is reviewed by both computers and staff to ensure the data is of the highest possible quality. There are several programs available to the home meteorologist that will compare data on a geographical basis, so you can see site-specific data, and how it compares to other nearby weather sites.

How is all this data processed and used?…For the Cooperative Weather Observers, data may be entered via either WxCoder III or IV-Rocs. These are the only systems authorized for daily data entry. They have built-in data and formatting checks. For SKYWARN observers, data may be entered via the telephone, or be relayed by police, emergency management, or amateur radio operators. Most of the other available data entry systems are automated.

Once the data is in the office, it gets checked by both computer and a member of our Data Acquisition Team. Your information is checked for proper formatting as well as data quality. At this point, it is ready to be used by NWS forecasters in their computer models. Your data is blended with other data (such as national and regional forecast models) to present a color-coded picture (grids) that can be manipulated by the forecaster.

What happens to my data after the forecast process?...From this point, your data is once again handled by our Data Acquisition team to create reports/summaries that are made available to a wide variety of users. You might see an example on the evening news when your local forecaster shows what the low temperatures around the region were this morning.



In addition, your data has historical value. Perhaps you recorded a new record low overnight, or maybe you recorded a record snowfall. Perhaps your data will be used in a storm damage report (like many were during Irene and Sandy). It may be used in criminal investigations, accident reconstruction or any of a wide number of activities.

At the end of each month, we will forward your reports to the National Climatic Data Center in Asheville, NC, where your data may be placed next to weather observations taken by George Washington or Thomas Jefferson. One of our coop sites has been taking observations daily, and without a miss, since 1889, and is being utilized in studies assessing climate change.

So…that's a brief and simple look at how your data moves through the system. This is why it's important that as a Cooperative Observer using WxCoder III, you close out your monthly report no later than the 10th of the following month. We need you to do this so we have time to review your data and meet our deadline to get the data to NCDC by the 25th of the following month.

Also, with winter here, don't forget to remove your funnels (if you haven't already done so) from your rain gages. If you have an automated gage, don't forget to add your antifreeze. If you have problems, please remember to contact us so we can schedule repairs. Anyone who takes your call can assist you. You no longer have to ask for a specific person.

In the next issue, we'll discuss the SuperForm in WxCoder III.

□

From the Editor's Desk

Outside of Sandy, it wasn't too unusual a fall, as we learned from this issue's first two offerings. Even Sandy's impact on our region was minimal, especially when compared to the New York City Tri-State region. If true, the arctic sea ice scenario portrayed in our third article seems quite alarming for our global climate future. On the other hand, it will be interesting to see if this winter will indeed be back to normal for us as our fourth and final feature article alludes to. A many thanks to all of our authors for their contributions. We offer you best wishes going forward into the New Year, and we look forward to presenting you with more feature articles in the spring for your reading pleasure.□

WCM Words

Steve DiRienzo
Warning Coordination Meteorologist, NWS Albany

If you are a weather spotter, there are a growing number of ways to report current weather to the National Weather Service, including social media sites like Facebook and Twitter. You can also use the relatively old-fashioned methods of email and the telephone.

Another option is "Ping", the Precipitation Identification Near the Ground project. You can report precipitation type using your smartphone, or through a webpage form. More information on Ping can be found at:

http://www.nssl.noaa.gov/projects/ping/

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.

Peaceful and joyous holidays to all.□