NORTHEASTERN STORM BUSTER

Summer 2015 - VOL. 20, NO. 3
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FEATURES

DEPARTMENTS

SPRING 2015: FROM COLD TO WARM, AND VERY DRY

Evan L. Heller
Climatologist, NWS Albany, NY

The spring season started off as an extension of a bitterly cold winter. The late winter was exceptionally cold. February 2015 was Albany's second-coldest February on record, and it looked like March wasn't going to get much warmer. But while more than three-quarters of the days of March were below normal (in half the cases, 10 or more degrees below normal), March wound up being almost 3 degrees shy of making Albany's Top Ten Coldest Marches list. The first week of the month was bitterly cold except for one day where the mean temperature was in the mid 30s. Three of these dates averaged less than 20 degrees. But things started looking up starting in week 2 as no further days saw averages in the teens. Twenty-eight days dipped to freezing or below, but only one date, the 6th, recorded a zero low (Table 2a). The 6th was also the coldest day of the season, but the 1st recorded the lowest maximum reading for any day…26°. The only records of any kind were three daily maximum wind speed types (Table 3a). The month was 5.2 degrees below normal (Table 1). March was also a dry month, but not as dry as May would end up being, and it was not dry enough to make a list. Sixty-two percent of the monthly total fell on the 26th alone. As for snow, it was the 28th that saw the most during the season…1.9".

April marked the end of anything winter-related. The last snowfall, amounting to just a trace, was recorded on the 24th, with the last freeze occurring the very next day (Table 2b). The monthly mean temperature was 47.8°, and this was exactly normal (Table 1). Indeed, April marked a turning point in the way Spring 2015 would trend regarding temperatures. It was a little wetter than March, but still more than an inch below normal. Again in April, only daily maximum wind records were set (Table 3b). The windiest day occurred in April. This was on the 4th when a 49 mph wind gust helped boost the average wind speed for the day to 16.7 mph (Table 4b). April also marked the beginning of the thunderstorm season, with the first booms of thunder heard on the 10th in the Albany area.

May was above normal more than March was below (Table 1), and a variety of records were set. The month ended up being the 4th-warmest May on record at Albany (Table 3c). See Image A below for a bar graph look at the Top 10. It also broke into the Top Ten Warmest Mean Maximum and Warmest Mean Minimum May Temperatures charts. The only other record for temperature was a daily high minimum set on the 26th. The month also represented one of the driest Mays on record. Albany's 1.05" total placed it in a tie at #7 (Image B). This total also placed May in a 2-way tie for 136th-driest month of all-time. Finally, two more records for daily maximum wind speed were tied or broken. More than one-third of the monthly total rainfall fell on the 30th (Table 1). After nearly 20 years, Albany had its first dry spell…a 14+ consecutive calendar-day period of no more than a trace of precipitation on any given day, and it ran exactly 14 days, from April 28th through

May 11th. The last dry spell in Albany occurred in August of 1995. Previously there had never been more than 8 years between dry spells.

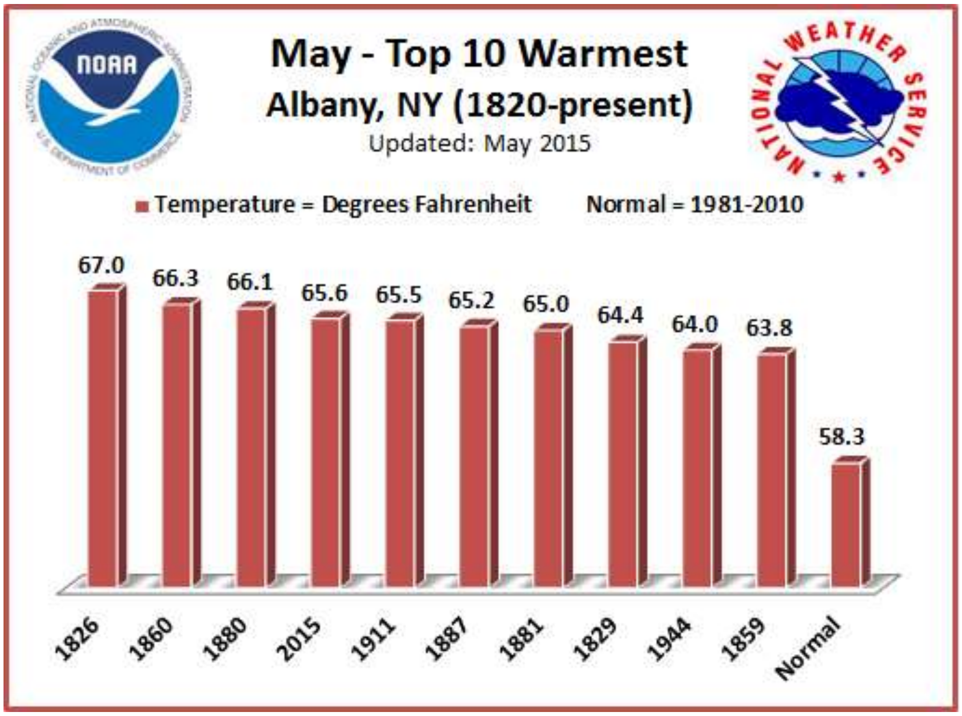


Image A. Courtesy Ingrid A. Amberger, NWS Albany, NY

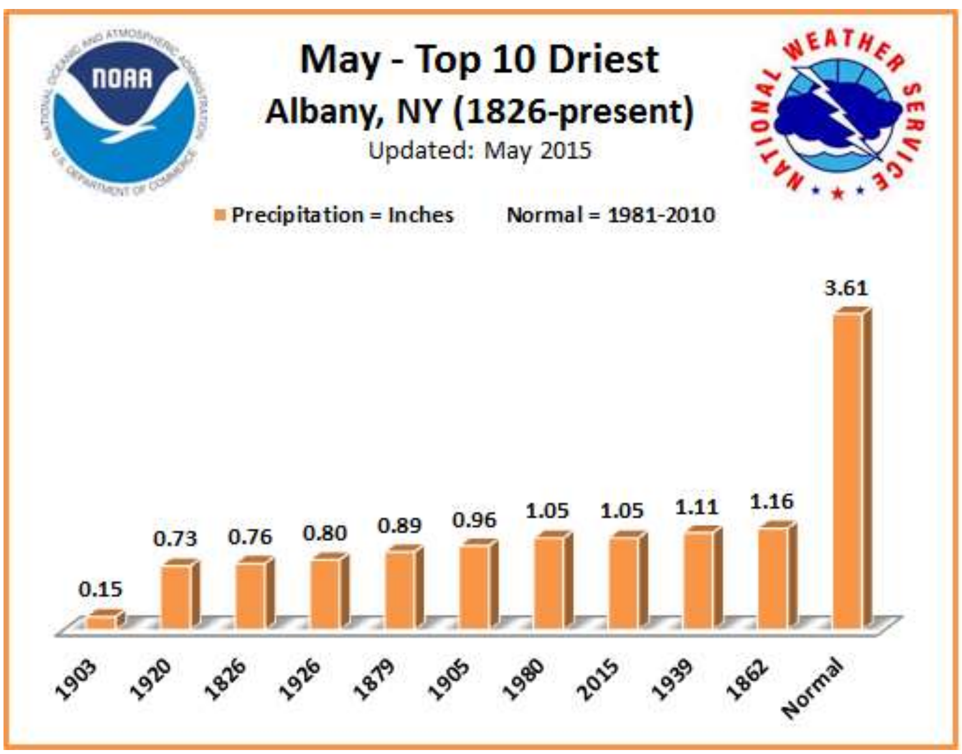


Image B. Courtesy Ingrid A. Amberger, NWS Albany, NY

On the seasonal scale, the lack of precipitation (as well as snowfall) was most profound. The 4.40" precipitation total made Spring 2015 the 4th-driest on record (Image C; Table 3d), but the mean temperature was less than one degree above normal. (Table 1).

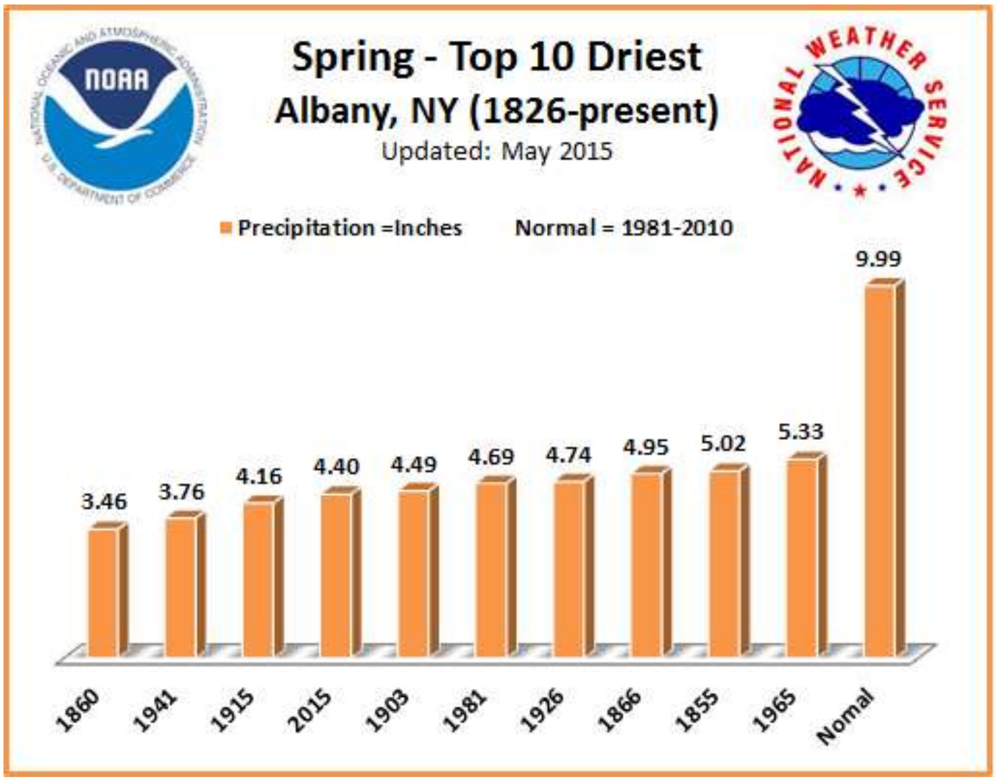


Image C. Courtesy Ingrid A. Amberger, NWS Albany, NY

STATS

	MAR	APR	MAY	SEASON
Average High Temperature/Departure from Normal	39.0°/-5.4°	58.7°/+0.4°	78.4°/+9.0°	58.7°/+1.3°
Average Low Temperature/Departure from Normal	20.7°/-5.0°	36.9°/-0.4°	52.8°/+5.7°	36.8°/+0.1°
Mean Temperature/ Departure From Normal	29.1°/-5.2°	47.8°/+/-0°	65.6°/+7.3°	47.8°/+0.8°
High Daily Mean Temperature/Date	42.5°/11th	60.0°/29th	78.5°/26th	
Low Daily Mean Temperature /Date	13.5°/6th	33.5°/5th	50.5°/20th	
Highest Temperature reading/Date	49°/10th & 25th	77°/18th	89°/8th	
Lowest Temperature reading/Date	0°/6th	25°/1st, 2nd & 5th	37°/14th	
Lowest Maximum Temperature reading/Date	26°/1st	41°/8th	58°/20th	
Highest Minimum Temperature reading/Date	37°/11th	48°/14th	71°/26th	
Total Precipitation/Departure from Normal	1.25"/-1.96"	2.10"/-1.07"	1.05"/-2.56"	4.40"/-5.59"
Total Snowfall/Departure from Normal	5.3"/-4.9"	T/-2.3"	0.0"/-0.1"	5.3"/-7.3"
Maximum Precipitation/Date	0.78"/26th	0.54"/21st	0.37"/30th	
Maximum Snowfall/Date	1.9"/28th	T/5th, 8th, 23rd & 24th	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	0	0/92
Low 70° or above	0	0	1	1/92
High 32° or below	6	0	0	6/92
Low 32° or below	28	8	0	36/92
Low 0° or below	1	0	0	1/92
OBS. PRECIP DAYS				
Days T+	18	17	14	49/92/53%
Days 0.01”+	10	11	6	27/92/29%
Days 0.10”+	2	8	4	14/92/15%
Days 0.25”+	1	4	3	8/92/9%
Days 0.50”+	1	1	0	2/92/2%
Days 1.00”+	0	0	0	0/92/0%

Table 2a

NOTABLE TEMP, PRECIP & SNOW DATES	MAR	APR	MAY
Last Snowfall	-	24th (T)	-
Last Freeze	-	25th (30°)	-
Zero Degree Date	6th (0°)	-	-
Dry Spell (14+ consecutive days no meas. precip.)	-	28th ->	->11th

Table 2b

RECORDS

ELEMENT	MARCH	
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	51 mph/W/2nd	44 mph/W/2011
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	47 mph/NW/17th	47 mph/NW/1994
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	48 mph/W/18th	47 mph/NW/2011

Table 3a

ELEMENT	APRIL	
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	43 mph/S/13th	43 mph/W/2007
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	49 mph/W/18th	41 mph/SE/2013

Table 3b

ELEMENT	MAY	
Daily High Minimum Temperature Value/Date | Previous Record/Year	71°/26th	70°/1880
Top 10 Warmest Mean Mays Value/Rank | Remarks	65.6°/#4	-
Top 10 Warmest Mean Maximum Mays Value/Rank | Remarks	78.4°/#1	-
Top 10 Warmest Mean Minimum Mays Value/Rank | Remarks	52.8°/#8	-
Top 10 Driest Mays Value/Rank | Remarks	1.05”/#7	-
Top 200 Driest Months Value/Rank | Remarks	1.05”/#136 (2-way tie)	-
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	39 mph/NW/19th	38 mph/NW/2008
Daily Maximum Wind Speed Value/Direction/Date | Previous Record/Direction/Year	35 mph/W/25th	35 mph/S/2011

Table 3c

ELEMENT	SPRING	
Top 10 Driest Springs Value/Rank | Remarks	4.40”/#4	none

Table 3d

MISCELLANEOUS
MARCH

Average Wind Speed/Departure from Normal	9.4 mph/-0.2 mph
Peak Wind/Direction/Date	51 mph/W/2nd
Windiest Day Average Value/Date	16.2 mph/18th
Calmest Day Average Value/Date	3.0 mph/24th
# Clear Days	8
# Partly Cloudy Days	11
# Cloudy Days	12
Dense Fog Dates (code 2)	11th, 14th & 26th
Thunder Dates (code 3)	None
Sleet Dates (code 4)	3rd, 25th & 26th
Hail Dates (code 5)	None
Freezing Rain Dates (code 6)	3rd

Table 4a

APRIL

Average Wind Speed/Departure from Normal	9.3 mph/+/-0 mph
Peak Wind/Direction/Date	49 mph/W/4th & 18th
Windiest Day Average Value/Date	16.7 mph/4th
Calmest Day Average Value/Date	4.3 mph/30th
# Clear Days	4
# Partly Cloudy Days	14
# Cloudy Days	12
Dense Fog Dates (code 2)	None
Thunder Dates (code 3)	10th, 20th & 21st
Sleet Dates (code 4)	8th
Hail Dates (code 5)	None
Freezing Rain Dates (code 6)	None

Table 4b

MAY

Average Wind Speed/Departure from Normal	8.4 mph/+0.4 mph
Peak Wind/Direction/Date	42 mph/NW/12th
Windiest Day Average Value/Date	14.6 mph/20th
Calmest Day Average Value/Date	2.9 mph/14th
# Clear Days	3
# Partly Cloudy Days	24
# Cloudy Days	4
Dense Fog Dates (code 2)	None
Thunder Dates (code 3)	10th, 19th, 27th & 30th
Sleet Dates (code 4)	None
Hail Dates (code 5)	None
Freezing Rain Dates (code 6)	None

Table 4c

ADJUSTMENTS MADE TO THE 1981-2010 ALBANY SNOWFALL NORMALS

Ingrid Amberger
Climatologist, NWS Albany

The 1981-2010 snowfall normals for Albany, New York have been adjusted. It was revealed that some storms were missing in the months of October, January, February and March. Therefore, missing data had not been factored into the original computation of the 1981-2010 normals. After verification of the new data, the 1981-2010 snowfall normals were re-computed for Albany, New York.

Months	Updated 1981-2010 Snowfall Normals	Initial 1981-2010 Snowfall Normals
October	0.3”	Trace
November	2.8”	2.8”
December	13.7”	13.7”
January	17.9”	17.6”
February	12.2”	12.4”

March	11.0”	10.2”
April	2.3”	2.3”
May	0.1”	0.1”
Total	60.3”	59.1”

The necessary corrections have been made to our climate database, and to the associated climate reference materials for Albany, New York which can be found on our climate web page at: www.weather.gov/aly/climate

NOAA’S 2015 ATLANTIC HURRICANE OUTLOOK

Kevin S. Lipton
Meteorologist, NWS Albany

On May 27, 2015, NOAA’s Climate Prediction Center issued its 2015 hurricane outlook for the Atlantic Basin, which includes the North Atlantic Ocean, Caribbean Sea, and Gulf of Mexico, and they’re expecting a “below-normal” season. A “normal” hurricane season in the Atlantic Basin spawns 12 named storms (either tropical storms or hurricanes), 6 being hurricanes, with 3 hurricanes potentially attaining “major” status – those reaching category 3 or higher on the Saffir-Simpson Scale which measures hurricane intensity. The Climate Prediction Center’s forecast for this year is for the number of named storms to range from 6 to 11 (this includes Tropical Storm Ana which already formed in May), with the expectation for 3 to 6 of them to reach hurricane status, and 0 to 2 to reach “major” status (**Figure 1**). For reference, the 2014 Atlantic hurricane season witnessed a below-normal season overall, with 8 named storms, 6 of which were hurricanes, 2 reaching “major” status.

This year’s forecast is heavily dependent on three main factors. The first and biggest factor involves the expectation for El Niño to persist and strengthen in the eastern tropical Pacific Ocean. El Niño refers to the presence of abnormally warm sea surface temperatures across the eastern and central tropical Pacific Ocean. What do Pacific Ocean water temperatures have to do with hurricanes in the Atlantic Ocean? Well, typical conditions across the tropical Pacific Ocean involve warmer water across the far western Pacific Ocean, along with associated thunderstorm development, while the waters in the eastern tropical Pacific normally remain relatively cool, with limited thunderstorm activity. The opposite is true when an El Niño is present – the warmer waters and associated thunderstorm development shift much further eastward in the tropical Pacific Ocean. When this occurs, winds within the upper levels of the atmosphere strengthen across the eastern Pacific Ocean, and these strong upper-level winds can even stretch westward across the tropical Atlantic Ocean. These strong upper-level winds tend to rip apart thunderstorms across the Atlantic Ocean, limiting the potential for these to organize into tropical cyclones. Therefore, when an El Niño is present, overall tropical cyclone activity is usually less than the normal in the Atlantic Basin. Most current indicators, such as recent water temperatures, wind patterns, and computer forecast projections of these fields over the next several months strongly suggest that an El Niño is already in progress, and that it should actually strengthen during the upcoming summer months. Assuming this occurs, conditions should also favor upper-level winds becoming stronger than normal across the tropical Atlantic Ocean, thereby limiting the overall number of potential tropical cyclones that develop this season. But should the El Niño intensify more slowly than is currently expected, or even weaken, then it is possible that the overall number of tropical cyclones for 2015 trends on the higher side of the forecast range.

The second main factor incorporated into this season's forecast is the lack of anomalously warm water temperatures observed across much of the tropical Atlantic Ocean as of early June, as shown in **Figure 2**, where the seedlings to eventual tropical cyclones traverse during the season. Tropical cyclones need warm ocean temperatures to gather strength – normally, water temperatures above 80^0 F (Fahrenheit). The initial atmospheric disturbances that can eventually transform into tropical cyclones pass across this region of the tropical Atlantic Ocean on their long westward journey toward the western Atlantic Ocean. If water temperatures reach or exceed 80^0 F, these initial disturbances can organize and develop a circulation, potentially reaching tropical storm, or even hurricane, strength. Sea surface temperatures as of late May were generally around or slightly below normal in this region, known as the Main Development Region for Atlantic tropical cyclones, and are expected to remain near to slightly below normal during the summer months. These water temperatures being forecast to remain near or slightly below normal through the summer months is a limiting factor for expected Atlantic tropical cyclone development this year.

The third factor which is included in the 2015 hurricane outlook is the role of the Atlantic Multi-decadal Oscillation (AMO). The AMO exhibits two Atlantic hurricane season phases: a more active one known as the "warm" phase, which has persisted since 1995, and a more inactive or "cold" phase, in which seasonal Atlantic hurricane activity is less. These phases tend to last for several decades, and are related to the West African monsoon system. The warm phase of the AMO is associated with enhanced African monsoon activity-which tends to allow for more frequent thunderstorm clusters to move off the west coast of Africa into the Main Development Region of the Atlantic Ocean. These thunderstorm clusters can then develop into tropical cyclones, assuming other conditions are favorable. During the cold phase of the AMO, there is reduced African monsoon activity, with fewer thunderstorm clusters moving off the West African coast. So – during these inactive phases, there are fewer initial atmospheric disturbances available to cross the tropical Atlantic Ocean and become potential tropical cyclones. As mentioned, the AMO has been in the active phase since 1995. However, there are some signals that this phase may be switching to the "cold" or inactive phase. Due to the uncertainty, confidence in the AMO role for this hurricane season is low.

It should be noted that in May of 2014, NOAA's Climate Prediction Center forecasted a near- to below-normal season for the Atlantic Basin, with a prediction of 8-13 named storms, 3-6 reaching hurricane strength, and 1-2 attaining "major" hurricane status. As noted above, the actual result was 8 named storms, 6 being hurricanes, 2 of which reached "major" status – generally within the 2014 forecast ranges.

So – the official forecast for the 2015 Atlantic hurricane season issued by NOAA's Climate Prediction Center favors a "below-normal" season based on these three main factors. Of course, changes to any of these factors could easily alter this year's outcome. The Climate Prediction Center will issue an updated forecast in August, 2015, taking into account these and other factors, and will adjust the forecast accordingly.

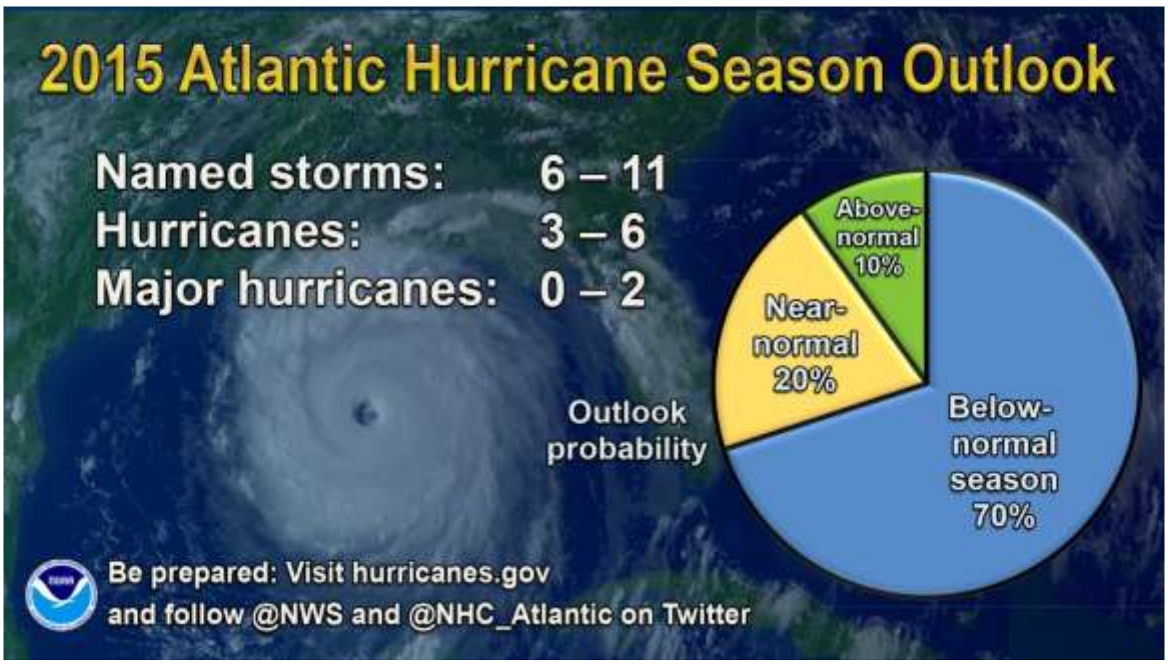


Figure 1. The official 2015 Atlantic Hurricane Outlook, issued by NOAA's Climate Prediction Center on May 27, 2015. The pie graph on the right indicates the overall probabilities favoring a below-normal, normal or above-normal season for 2015. **Courtesy of NOAA.**

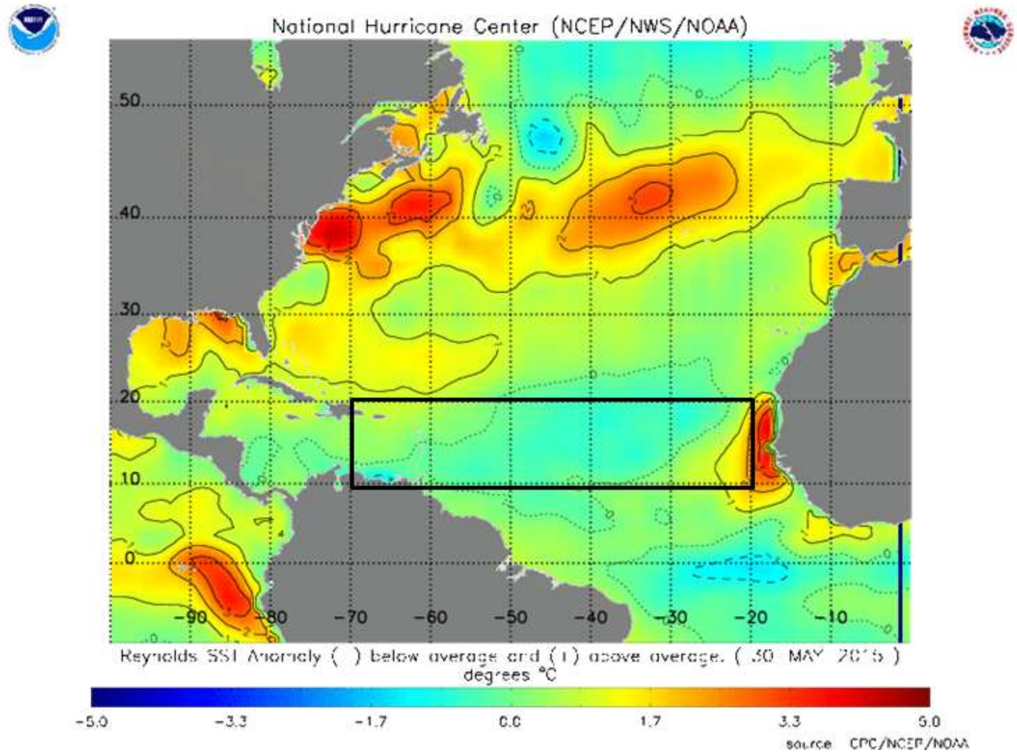


Figure 2. Anomalies of weekly-averaged sea surface temperatures (degrees Celsius) in the Atlantic Ocean, centered on May 30, 2015. The black rectangle denotes the Main Development Region, where Atlantic tropical cyclones are most likely to develop. The blue colors denote cooler sea surface temperatures compared to normal, which would potentially limit tropical cyclone development within the tropical Atlantic Ocean. **Image from NOAA's National Hurricane Center and the Climate Prediction Center/NCEP.**

NOAA ONLINE WEATHER DATA - NOWData

Ingrid Amberger
Climatologist, NWS Albany

Did you know you can access climate data for many locations across east central New York and western New England via NOWData, NOAA's public on-line weather data tool? There are 21 locations across east central New York, and 9 locations across western New England including 2 in Litchfield County, Connecticut, 3 in Berkshire County, Massachusetts, and 4 across southern Vermont (Bennington and Windham Counties).

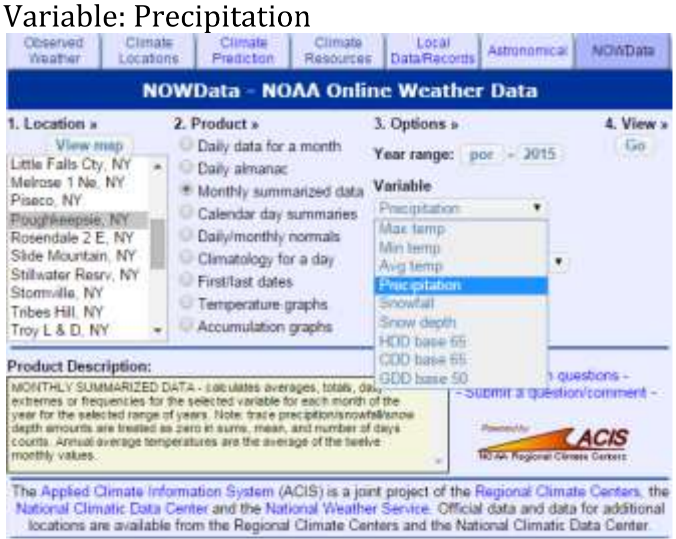
The period of record varies for each location and there may be missing data and/or gaps in the data. There are two listings for Albany: "Albany Area" and "Albany International Airport". Why is this? The "Albany Area" period of record dates to 1874 and includes the climate data from all six locations used for observations for Albany over the years, including "Albany International Airport" (refer to chart below).

DATES	Albany NY Climate Record Locations
December 22, 1873 to June 30, 1874	Signal Services…U.S. Army opened first weather reporting station sponsored by the Federal Government at the Dudley Observatory at Dudley Heights, Albany
July 1, 1874 to March 12, 1880	Move to new building on the grounds of the Dudley Observatory, constructed near the original station location expressly for the purpose of weather reporting
March 13, 1880 to September 30, 1884	S.K. Grey's Building (4th floor) at 42-44 State Street, Albany
October 1, 1884 to April 17, 1935	U.S. Custom House and Post Office, Albany
April 18, 1935 to May 31, 1938	New Post Office Building at Broadway and Maiden Lane, Albany
June 1, 1938 to present	Albany Airport Station at what is now Albany International Airport, Colonie
Original Source: U.S. Department of Commerce Weather Bureau, 1946 Annual Meteorological Summary	

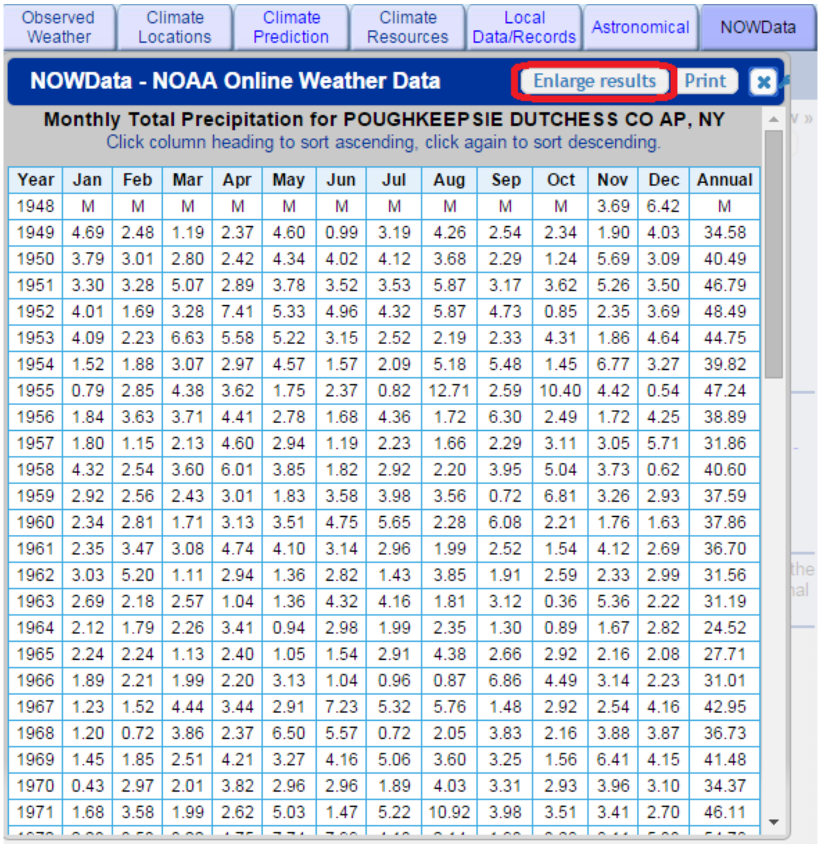
There are numerous ways to view the data, which you control via the product and options you choose. You can look up data for a single day, month, season or year. A description is provided for each of the products. The variables available are: temperature (maximum. minimum and average); precipitation; snowfall; snow depth; heating degree days (HDD); cooling degree days (CDD), and; growing degree days (GDD). Please note that not all variables are available for each location.

Here is an example:

1. Location : Poughkeepsie, NY
2. Product: Monthly summarized data
3. Options:
    a. Year range = por - 2015 ("por" means period of record)
    b. Variable: Precipitation



4. View: Go (you can sort the data by clicking on the column headers)

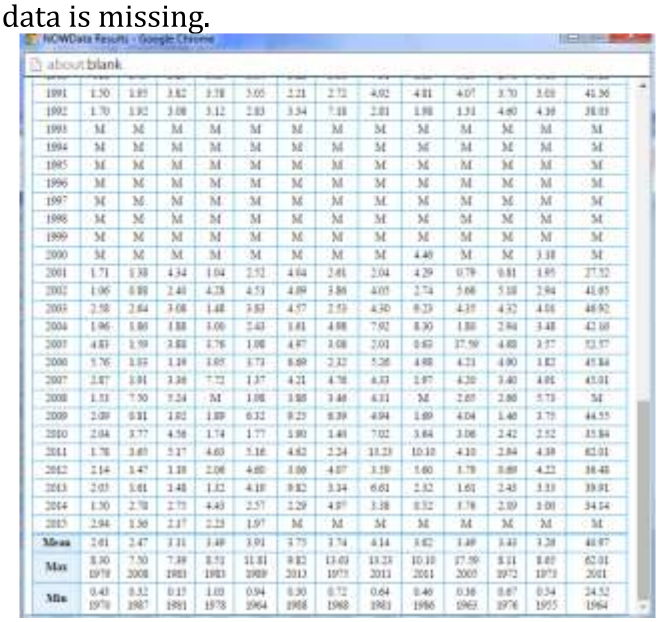


Monthly Total Precipitation for POUGHKEEPSIE DUTCHESS CO AP, NY

Click column heading to sort ascending, click again to sort descending.

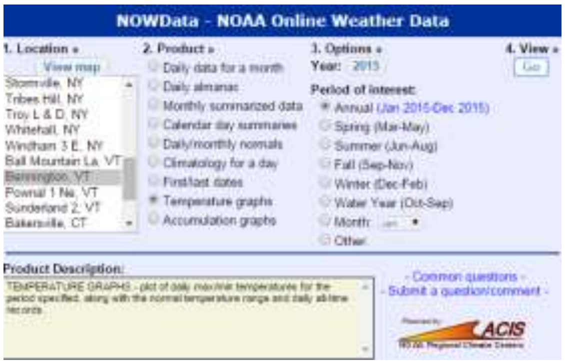
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1948	M	M	M	M	M	M	M	M	M	M	3.69	6.42	M
1949	4.69	2.48	1.19	2.37	4.60	0.99	3.19	4.26	2.54	2.34	1.90	4.03	34.58
1950	3.79	3.01	2.80	2.42	4.34	4.02	4.12	3.68	2.29	1.24	5.69	3.09	40.49
1951	3.30	3.28	5.07	2.89	3.78	3.52	3.53	5.87	3.17	3.62	5.26	3.50	46.79
1952	4.01	1.69	3.28	7.41	5.33	4.96	4.32	5.87	4.73	0.85	2.35	3.69	48.49
1953	4.09	2.23	6.63	5.58	5.22	3.15	2.52	2.19	2.33	4.31	1.86	4.64	44.75
1954	1.52	1.88	3.07	2.97	4.57	1.57	2.09	5.18	5.48	1.45	6.77	3.27	39.82
1955	0.79	2.85	4.38	3.62	1.75	2.37	0.82	12.71	2.59	10.40	4.42	0.54	47.24
1956	1.84	3.63	3.71	4.41	2.78	1.68	4.36	1.72	6.30	2.49	1.72	4.25	38.89
1957	1.80	1.15	2.13	4.60	2.94	1.19	2.23	1.66	2.29	3.11	3.05	5.71	31.86
1958	4.32	2.54	3.60	6.01	3.85	1.82	2.92	2.20	3.95	5.04	3.73	0.62	40.60
1959	2.92	2.56	2.43	3.01	1.83	3.58	3.98	3.56	0.72	6.81	3.26	2.93	37.59
1960	2.34	2.81	1.71	3.13	3.51	4.75	5.65	2.28	6.08	2.21	1.76	1.63	37.86
1961	2.35	3.47	3.08	4.74	4.10	3.14	2.96	1.99	2.52	1.54	4.12	2.69	36.70
1962	3.03	5.20	1.11	2.94	1.36	2.82	1.43	3.85	1.91	2.59	2.33	2.99	31.56
1963	2.69	2.18	2.57	1.04	1.36	4.32	4.16	1.81	3.12	0.36	5.36	2.22	31.19
1964	2.12	1.79	2.26	3.41	0.94	2.98	1.99	2.35	1.30	0.89	1.67	2.82	24.52
1965	2.24	2.24	1.13	2.40	1.05	1.54	2.91	4.38	2.66	2.92	2.16	2.08	27.71
1966	1.89	2.21	1.99	2.20	3.13	1.04	0.96	0.87	6.86	4.49	3.14	2.23	31.01
1967	1.23	1.52	4.44	3.44	2.91	7.23	5.32	5.76	1.48	2.92	2.54	4.16	42.95
1968	1.20	0.72	3.86	2.37	6.50	5.57	0.72	2.05	3.83	2.16	3.88	3.87	36.73
1969	1.45	1.85	2.51	4.21	3.27	4.16	5.06	3.60	3.25	1.56	6.41	4.15	41.48
1970	0.43	2.97	2.01	3.82	2.96	2.96	1.89	4.03	3.31	2.93	3.96	3.10	34.37
1971	1.68	3.58	1.99	2.62	5.03	1.47	5.22	10.92	3.98	3.51	3.41	2.70	46.11

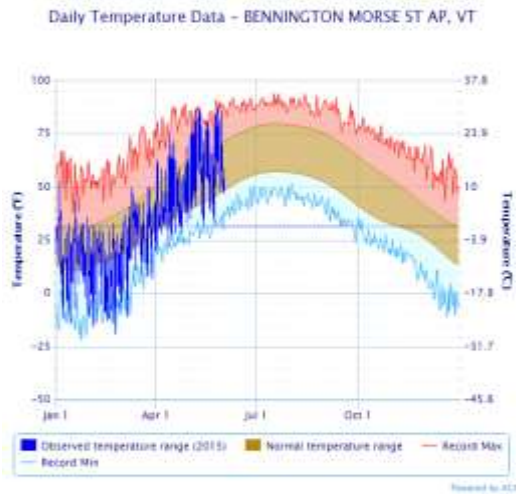
When you "enlarge results", you can still sort the data. At the bottom of the table, you will find the mean as well as maximum and minimum values, with times of occurrence. Note that "M" means data is missing.



1991	1.50	[illegible]	3.82	3.78	3.05	2.21	2.72	4.02	4.81	4.07	3.70	3.08	41.36
1992	1.70	1.92	3.08	3.12	2.83	3.34	7.18	2.81	1.98	1.31	4.60	4.38	38.03
1993	M	M	M	M	M	M	M	M	M	M	M	M	M
1994	M	M	M	M	M	M	M	M	M	M	M	M	M
1995	M	M	M	M	M	M	M	M	M	M	M	M	M
1996	M	M	M	M	M	M	M	M	M	M	M	M	M
1997	M	M	M	M	M	M	M	M	M	M	M	M	M
1998	M	M	M	M	M	M	M	M	M	M	M	M	M
1999	M	M	M	M	M	M	M	M	M	M	M	M	M
2000	M	M	M	M	M	M	M	M	4.40	M	M	3.18	M
2001	1.71	1.38	4.34	1.04	2.52	4.04	2.61	2.04	4.29	0.79	0.81	1.95	27.52
2002	1.06	0.88	2.40	4.28	4.53	4.89	3.86	4.05	2.74	5.68	5.18	2.94	41.05
2003	2.58	2.64	3.08	1.48	3.83	4.57	2.53	4.30	8.23	4.37	4.32	4.06	46.92
2004	1.96	1.86	1.88	3.00	2.43	1.61	4.98	7.92	8.30	1.88	2.94	3.48	42.18
2005	4.83	1.59	3.88	3.76	1.08	4.97	3.08	2.01	0.63	17.59	4.88	3.57	52.57
2006	5.76	1.65	1.28	1.95	3.73	8.69	2.32	5.26	4.98	4.21	4.90	1.82	45.84
2007	2.87	1.01	3.38	7.72	1.37	4.21	4.78	4.33	1.97	4.20	3.40	4.01	45.01
2008	1.53	7.50	3.24	M	1.08	3.88	3.48	4.31	M	2.65	2.80	5.73	M
2009	2.09	0.81	1.82	1.89	6.32	9.23	8.39	4.94	1.69	4.04	1.40	3.75	44.55
2010	2.04	3.77	4.58	1.74	1.77	1.90	1.48	7.02	3.64	3.06	2.42	2.52	35.84
2011	1.78	3.65	5.17	4.63	5.16	4.82	2.24	13.23	10.10	4.10	2.84	4.38	62.01
2012	2.14	1.47	1.18	2.08	4.60	3.00	4.07	3.59	5.60	1.78	0.88	4.22	38.48
2013	2.03	1.61	3.48	1.32	4.18	9.82	3.34	6.61	2.32	1.61	2.45	3.33	39.91
2014	1.30	2.78	2.75	4.43	2.57	2.29	4.97	3.38	0.32	3.78	2.09	3.01	34.14
2015	2.94	1.36	2.17	2.23	1.97	M	M	M	M	M	M	M	M
Mean	2.61	2.47	3.31	3.49	3.91	3.75	3.74	4.14	3.62	3.49	3.43	3.28	40.97
Max	8.30 1979	7.50 2008	7.38 1983	8.51 1983	11.81 1989	9.82 2013	13.03 1975	13.23 2011	10.10 2011	17.59 2005	8.11 1972	8.07 1973	62.01 2011
Min	0.43 1970	0.32 1987	0.15 1981	1.03 1978	0.94 1964	0.30 1988	0.72 1968	0.64 1981	0.46 1986	0.36 1963	0.87 1976	0.34 1955	24.52 1964

You can also create graphs. Here is an example displaying 2015 temperatures for Bennington, Vermont. The graph shows the normal range of temperatures, and record maximums and minimums.





NOWData is a very powerful tool. A link to it can be found on our climate page at: www.weather.gov/aly/climate

WINTER 2014-15 ARCTIC SEA ICE EXTENT

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 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 in 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 2014-15 winter season was reached on February 25, 2015, and was about 15 days earlier than the average date of the maximum extent. The maximum ice extent on that day was 5.61 million square miles, which was 425,000 square miles below the 1979 to 2010 average, and the lowest since the satellite record began in 1979. Arctic sea ice extent began a slow decline after the February 25 maximum, but then began to increase again in early March, reaching a second peak at the end of March, which was only a little lower than the February 25 maximum.

At the other end of the world, Antarctic sea ice reached its annual summer minimum extent of 1.38 million square miles on February 20. This was the fourth highest summer minimum extent since the satellite record began in 1979.

WEATHER *ESSENTIALS*

With Kevin S. Lipton

WEATHER ESSENTIALS: THUNDERSTORM TYPES

Kevin S. Lipton

Northeastern U.S. residents can attest to the fact that there are numerous thunderstorms during the summer months. However, some may notice that there are actually different types – ranging from a typical late afternoon storm on a hot and humid day, to a particularly nasty storm heralding a drastic change in air mass. Indeed, they'd be correct. There are several different types of thunderstorms that typically affect eastern New York, western New England and the rest of the Northeastern U.S. during the summer months. The three main types are: "air mass" (or "pulse") thunderstorms; "multi-cellular", and; the rarest, yet most dangerous – the "supercell".

"Air mass" thunderstorms, also called "pulse" thunderstorms, are the most typical type storms to affect the northeast states. They usually form on hot, humid afternoons, are typically small in size, and tend to move fairly slowly. Air mass thunderstorms feed off the low-level heat and humidity that builds during the day. If conditions are cold enough in the mid levels of the atmosphere, towering clouds will develop, and may grow into individual thunderstorms. Air mass thunderstorms typically have relatively short life spans, i.e., they weaken and collapse rather quickly after they develop. However, before they do, they can produce brief periods of gusty winds, torrential rain and hail. Some of these storms can become severe, possibly producing damaging winds and large hail in very localized areas, as well as enough rain to cause isolated flooding. On rare occasions, they even produce a tornado, though usually weak and short-lived. Overall, air mass thunderstorms tend to be the most timid thunderstorm type affecting our region.

"Multi-cell" thunderstorms are larger and longer-lived than air mass type storms. They may initially form from individual air mass thunderstorms, but if conditions are right, they can merge or organize into clusters of storms. Similar to air mass thunderstorms, they also can produce severe weather (large hail greater than one inch in diameter, and/or high winds in excess of 58 mph) and/or flooding, but because they are larger and last longer, they typically affect much larger areas than air mass storms. Multi-cell storms are capable of taking on a linear orientation, commonly known as a squall line. Squall lines often move quite fast, and tend to produce very strong winds. They usually form ahead of cold fronts. While they can occur, tornadoes are infrequent with multi-cell thunderstorms. If multi-cell storms form an orientation that is nearly parallel to the upper-level steering winds, a condition known as "training" can occur, whereby individual thunderstorm cells affect the same area for long periods of time – a scenario which frequently produces flooding.

The most potent thunderstorm type to affect the Northeast is known as the "supercell". These storms actually contain some rotating characteristics within the mid levels of their structure. At times, this mid-level rotation can work down to the surface, producing a tornado. Indeed, supercell thunderstorms are the ones that tend to produce the most significant and longest-lived tornadoes, but fortunately, they are also the rarest type of thunderstorm affecting the region. In addition to tornadoes, supercell storms are often accompanied by very large and damaging hail (sometimes bigger than golf balls), strong winds and torrential rain. Supercells are more common across the central and southern Plains of the U.S.

So, the next time you hear the distant rumbles of thunder accompanying a darkening sky, wonder about what type of thunderstorm it might be, but be aware that whatever type it is, it is capable of producing severe weather, including tornadoes. Much more commonly, however, all types produce deadly cloud-to-ground lightning. So – as the saying goes – "when it roars, go indoors" – BE SAFE!

From the Editor's Desk

How quickly things seem to have changed. We went from wearing parkas in March and wondering whether we'd even have a normal summer, to shorts and bathing suits three short months later and wondering if this summer won't actually end up being one of our hottest. This climatology-rich issue's opener deals with a recap of the very extreme and record-setting spring climate season in the Albany area. Then we present adjustments to our local climate normals, talk about the upcoming hurricane season, show how you can access climate data from across the country in a few mouse clicks, and present this past winter's global ice cover data. This season's Weather Essentials presents great information about the different types of thunderstorms that affect our area. A special thank you goes out to all those authors who contributed to this issue. We hope you enjoy our offerings, and wish you a pleasant and safe summer!

WCM Words

Steve DiRienzo
Warning Coordination Meteorologist, NWS Albany

A reminder that the National Weather Service (NWS) not only forecasts the weather, but we also forecast the rivers. River observations and forecasts for the NWS Albany forecast area can be found at http://water.weather.gov/ahps2/index.php?wfo=aly.

Most of our river observations come to us from the United States Geological Survey (USGS). The USGS operates a water science center in Troy, NY. Their main web page is at: http://ny.water.usgs.gov/.

Most of our river forecasts are created by the NWS Northeast River Forecast Center in Taunton, MA. Probabilistic river forecasts are also available from the Northeast River Forecast Center at: http://www.erh.noaa.gov/mmefs/. We can run river forecast models here at the NWS office in Albany. We do this for some of the smaller, fast-responding creeks where there are observation gauges that include USGS river flow measurements.

River flows are dependent on rainfall across the river basins. Rainfall forecasts including probabilistic rainfall based on multiple forecast model runs are issued by the NWS Weather Prediction Center in College Park, MD. These can be found on the web at: http://www.wpc.ncep.noaa.gov/index.shtml.

Heavy rain in the summer that can cause flooding is usually caused by thunderstorms or tropical storms. The next time heavy rain is in the forecast, be prepared. Visit the above mentioned web sites and stay ahead of the weather and the water.

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 Northeastern StormBuster, or any of the operations of the National Weather Service, please let me know at Stephen.Dirienzo@noaa.gov.