

NORTHEASTERN

# STORM BUSTER



## Emergency Manager & Storm Spotter Magazine

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Evan L. Heller, Editor

Raymond O'Keefe, Publisher

Ingrid Amberger, Webmaster

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### **THREE MAJOR HOLIDAY WINTER WEATHER EVENTS IN 2007**

*Neil A. Stuart*

*Senior Forecaster, NWS Albany*

*Ingrid Amberger*

*Senior Forecaster, NWS Albany*

*John S. Quinlan*

*Senior Forecaster, NWS Albany*

After a warm start to the winter, the weather had turned cold and stormy by mid-January, and continued through February and March. Ironically, three of the biggest events of the winter occurred during mid-month holidays. The first was the Martin Luther King Day Ice Storm from January 14-15. This was followed by the Valentine's Day Snowstorm on February 14, and, finally, the St. Patrick's Day Snowstorm of March 16-17. Each storm had a significant impact on the region, with many traffic accidents and delays, cancelled flights at airports, and school closings. A summary of each storm follows, in chronological order, beginning with the Martin Luther King Day Ice Storm.

#### **A. The Martin Luther King Day Ice Storm**

Prior to the Martin Luther King Day Ice Storm, an arctic boundary moved southward across the region on Saturday, January 13, and stalled over the Mid-Atlantic region Saturday night. With the passage of this boundary, cold air was drawn in at and near the surface on northerly winds. Waves of low pressure moved eastward along the boundary during the long weekend.

A weak low passed to our south on Sunday, resulting in periods of light freezing rain. However, the primary, deeper low moved from the Ohio Valley

eastward across the local area on Monday, bringing heavier precipitation. The precipitation did start out as a period of sleet late Sunday night into early Monday morning, with snow across the southern Adirondacks. However, everything eventually changed to freezing rain.

Why freezing rain? At the surface, there was cold air, but aloft, warmer air moved in, causing the precipitation to melt as it fell through the warm layer. Then, the rain drops hit the freezing objects at the surface, and froze on contact. Warmer air did work in at and near the surface in the Capital District, and to the south and east, Monday afternoon and evening. Elsewhere, temperatures remained below freezing.

Significant ice accumulations occurred (Figures A1a and A1b), rendering over 100,000 utility customers without power. Ice accumulations across the region were between 1/3" and 1" (Figure A2). Saratoga County was hit particularly hard, with up to an inch of ice, resulting in about half the power outages. To make matters worse, winds increased Monday evening, placing additional strain on the already burdened trees and power lines. This led to additional power outages, even after the freezing rain had ended.

The low deepened and moved off to the northeast across the Canadian Maritimes Monday night and Tuesday, drawing arctic air in across the region. By Wednesday morning, temperatures fell into the single digits, and even to below zero.



*Figure A1b. Ice accumulation of 1/2" in Albany County on January 15, 2007 (Image courtesy Neil A. Stuart, NWS Albany, NY).*



*Figure A1a. Ice accumulation of 1/2" in Albany County on January 15, 2007 (Image courtesy Neil A. Stuart, NWS Albany, NY).*

# SPRING 2007 SKYWARN SPOTTER TRAINING SESSIONS LISTINGS BEGINNING ON PAGE 15

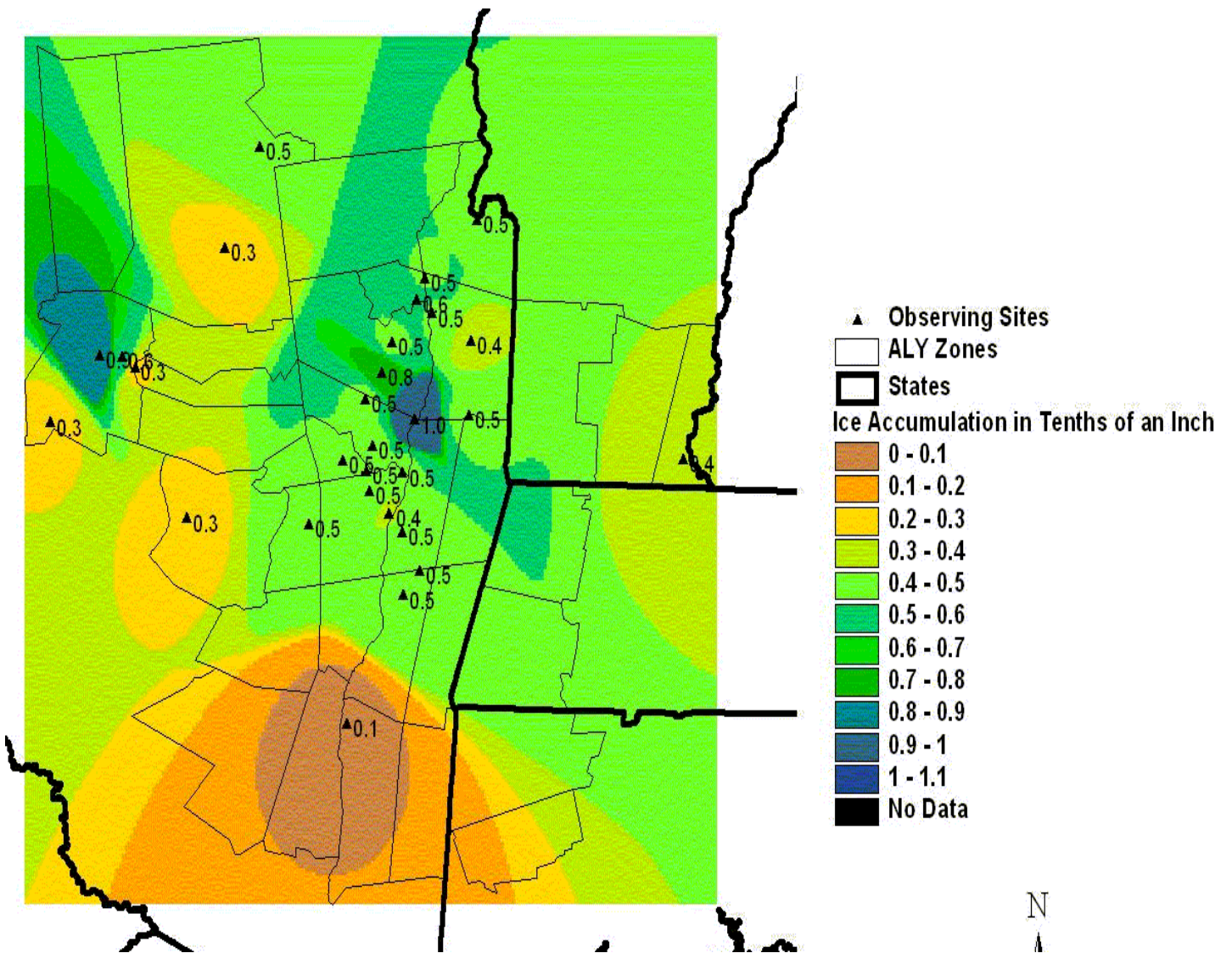


Figure A2. Ice accumulations across the region on January 15, 2007 (Image courtesy of John Quinlan, NWS Albany, NY).

### B. The Valentine's Day Snowstorm

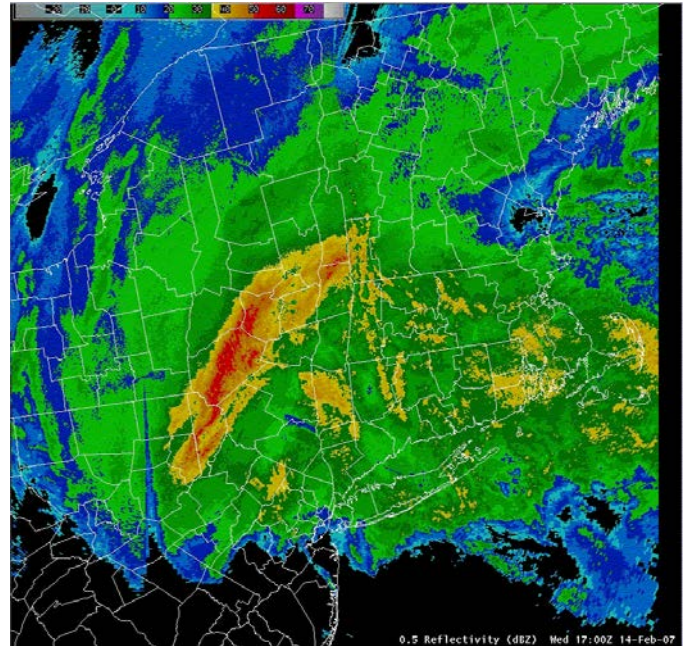
The historic Valentine's Day Storm was the first of two big snow events during the winter. It was the result of a weather pattern across North America that was just beginning to transition from cold and dry to more normal and stormier. The upper-atmospheric pattern that caused below normal temperatures across the eastern U.S. from mid-January into mid-February suppressed the storm track well to the south of our region, keeping the region cold and dry. By mid-February, the upper pattern began to change, and the Valentine's Day Storm signaled the change to more normal and stormier conditions.

Low pressure formed over the deep south early on Monday, February 12th. This system headed eastward into the southeastern United States on Tuesday, February 13<sup>th</sup>, and redeveloped along the mid-Atlantic coast by Wednesday morning, Valentine's Day. The low rapidly intensified as it passed just south of Long Island during the day on Valentine's Day. The low headed northeast along the coastline Wednesday night.

The area was pummeled with from one to more three feet of snowfall (Figure B2). Intense mesoscale snow bands developed, resulting in snowfall rates of 2 to 4 inches an hour, with localized amounts of 6 inches an hour, as indicated by radar returns (Figure B1). Warmer air moved in aloft at the 6,000- to 8,000-foot level, resulting in sleet mixing in with the snow at Albany and points south. Once the storm moved to our east Wednesday afternoon, cold air was rapidly drawn back into the area.

The forecast models were very accurate, with the potential for a significant event becoming evident 5 to 7 days before the storm. Especially within 3 to 5 days of impact, all the models were providing the same picture, a big snowstorm resulting from a very rare combination of cold Canadian air and tropical moisture, as evidenced by the satellite imagery presented in Figure B3. Such a combination typically results in snowstorms. Two to three days before impact, the majority of some 30+ forecast models suggested a large area of 1 to 2 foot snowfalls, with local amounts of up to 3 feet! Such agreement between over 30 forecast models two or more days in advance was nearly unprecedented, and provided the confidence for forecasters to predict the storm with great accuracy. The forecast models also suggested a

mix with sleet from the southern Catskills through the Taconics and Berkshires.



*Figure B1. Radar reflectivity mosaic for Noon February 14, 2007. Note the high reflectivities, represented by the orange and red colors, indicative of heavy snow rates of over 4" an hour.*

Don't forgot to sign  
up for your Spring  
**SKYWARN**  
training session.  
See page 15  
for details.

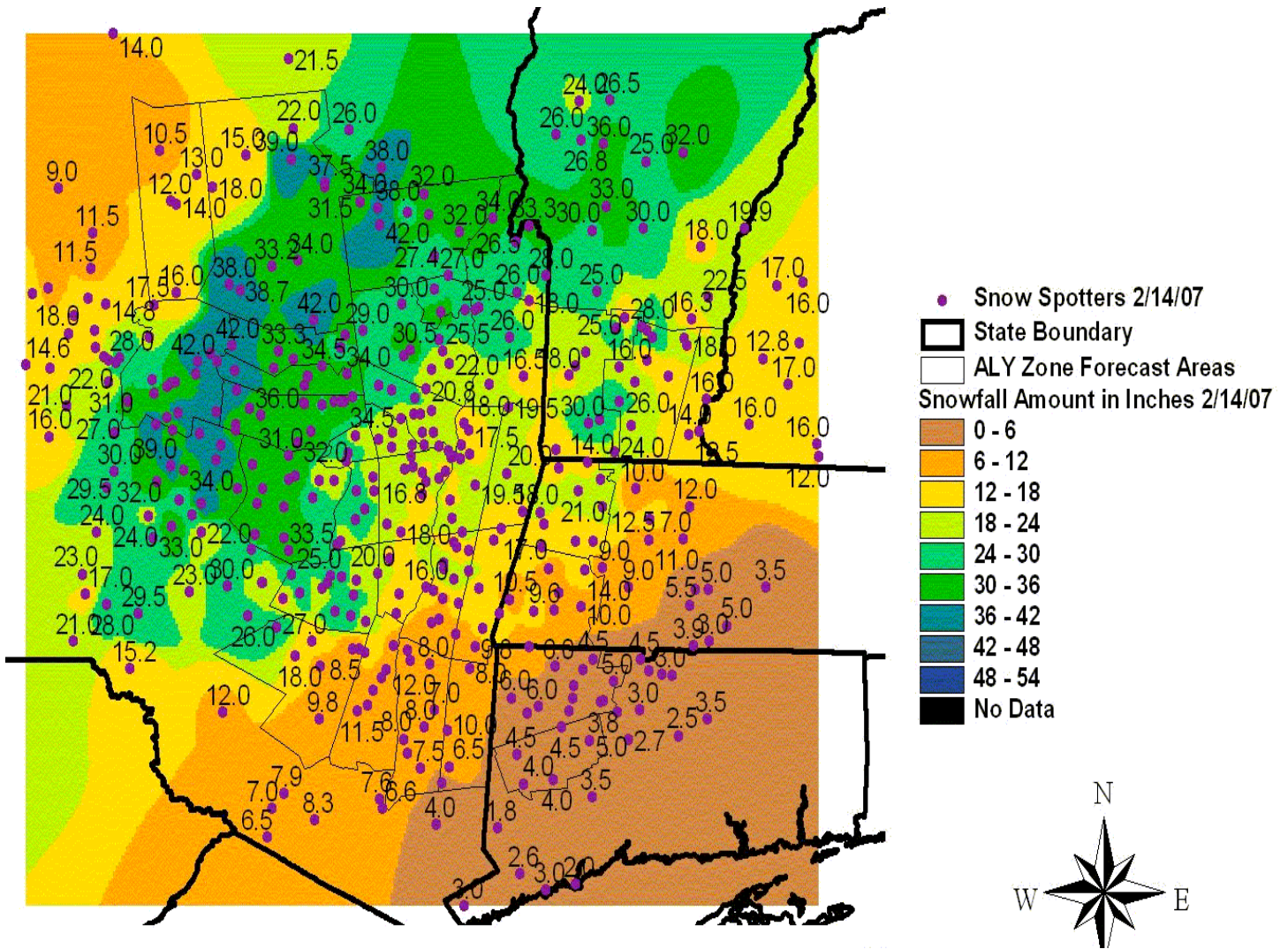
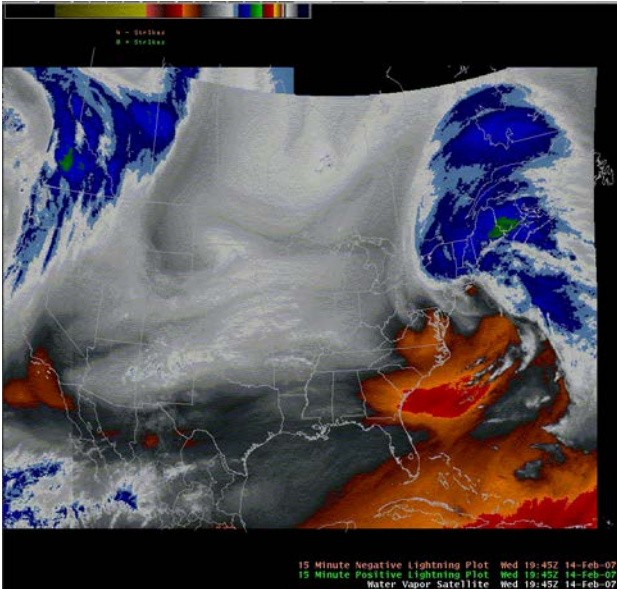


Figure B2. Snowfall map for Valentine's Day Snowstorm (Image courtesy of John Quinlan, NWS Albany, NY).



*Figure B3. Satellite imagery with 15-minute lightning plot overlay for 2:45 PM EST February 14, 2007. Note the classic comma-shaped cloud pattern, with the comma head and heaviest snow over upstate New York and northern New England.*

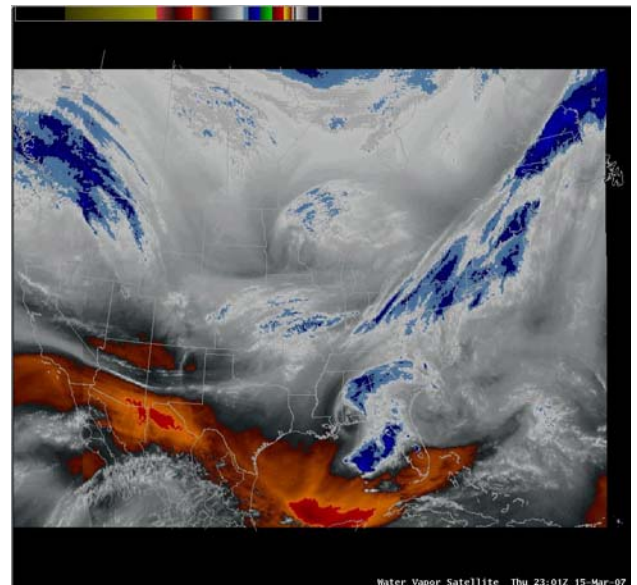
### C. The St. Patrick's Day Snowstorm

The St. Patrick's Day Snowstorm was an historic event that was the second-biggest St. Patrick's Day snowstorm on record for Albany, with 13.1 inches of snow. On March 16-17, 1956, Albany received 15.9 inches. On Wednesday, March 14, just two days prior to the onset of the St. Patrick's Day 2007 storm, the region basked in the first springtime weather of the season, with highs in the mid 60s. Cold Canadian high pressure built into the region on Thursday and Friday, as low pressure along the Gulf Coast merged with a storm heading southeast across the western Great Lakes (Figures C1a and C1b). The clash of the cold air with the Canadian and Gulf Coast storms was just the right set-up for a big snowstorm for the interiors of New York and New England.

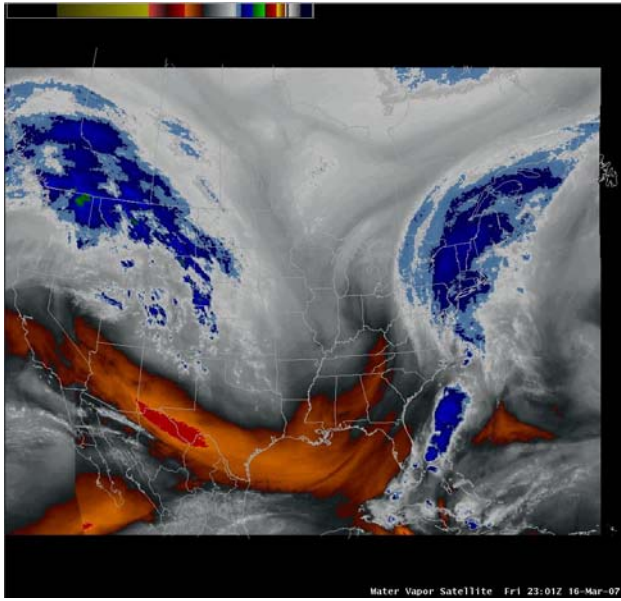
Snow began across the region around midday Friday, March 16, and continued, heavy at times, through much of the night, ending around sunrise on Saturday, March 17. One intense mesoscale snow band developed from the Catskills through northwestern Connecticut and parts of the Berkshires, resulting in snowfall rates of 2 to 3 inches in an hour, as indicated by radar (Figure C2). However, sleet was mixed with the snow in Connecticut and the Berkshires, cutting down on snow amounts there. Overall, 1 to 2 feet of snowfall

was observed in eastern upstate New York, with the most in the northern Catskills (Figure C3). The Capital District averaged between 13 and 16 inches. Parts of the Berkshires, southern Vermont, northwestern Connecticut and the Poughkeepsie area saw a mix with sleet and freezing drizzle during the early morning hours of St. Patrick's Day, but most of those locations still received more than 9 inches of snow and sleet. The Adirondacks were just north of the heaviest snow, but still managed to receive 6 to 9 inches of snow.

The forecast models hinted at the possibility of a major snowstorm 3 to 5 days prior to impact, but were not in very good agreement on timing and location until 2 days prior to the storm. Even 24 to 48 hours prior to impact, there was considerable disagreement as to how much precipitation would fall, and where mixed precipitation would cut down on snow amounts. There was enough agreement among the forecast models that all precipitation types added together would result in major snow amounts, independent of any sleet or freezing rain accumulations. Heavy Snow and Winter Storm Watches were issued during the afternoon of March 15, and Warnings were issued during the early morning of March 16. Even though model accuracy and consistency was not as good as for the Valentine's Day Storm, it is clearly evident that forecast models, and forecaster interpretation of them, continues to improve each season.



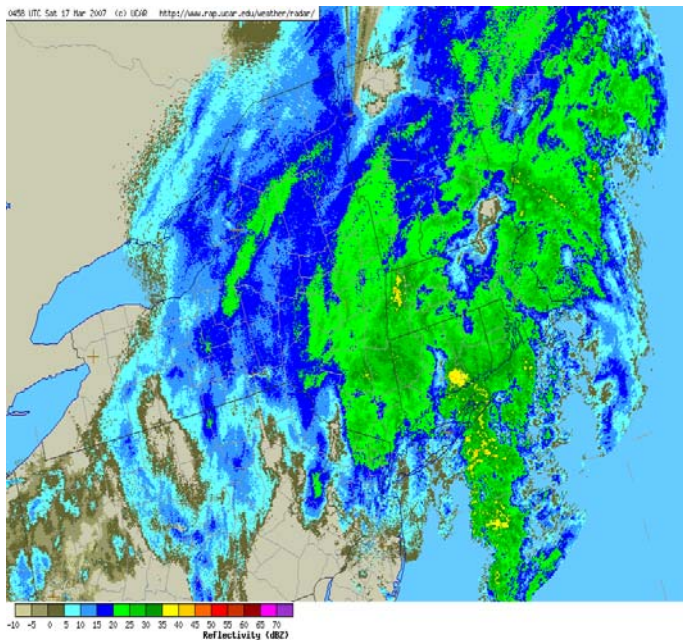
*Figure C1a. Satellite picture of the Gulf Coast Storm and western Great Lakes Storm at 7 PM EDT March 15, that merged and became the St. Patrick's Day Storm.*



***SPRING***



***Figure C1b. Satellite picture of the Gulf Coast Storm and western Great Lakes Storm at 7 PM EDT March 16, that merged and became the St. Patrick's Day Storm.***



***Figure C2. Regional radar at midnight on March 17, showing the mesoscale band from southern New York through northwest Connecticut and the Berkshires of Massachusetts. Image courtesy of the National Center for Atmospheric Research (NCAR).***

***SPOTTER  
TRAINING  
SESSIONS  
See Page 15.***

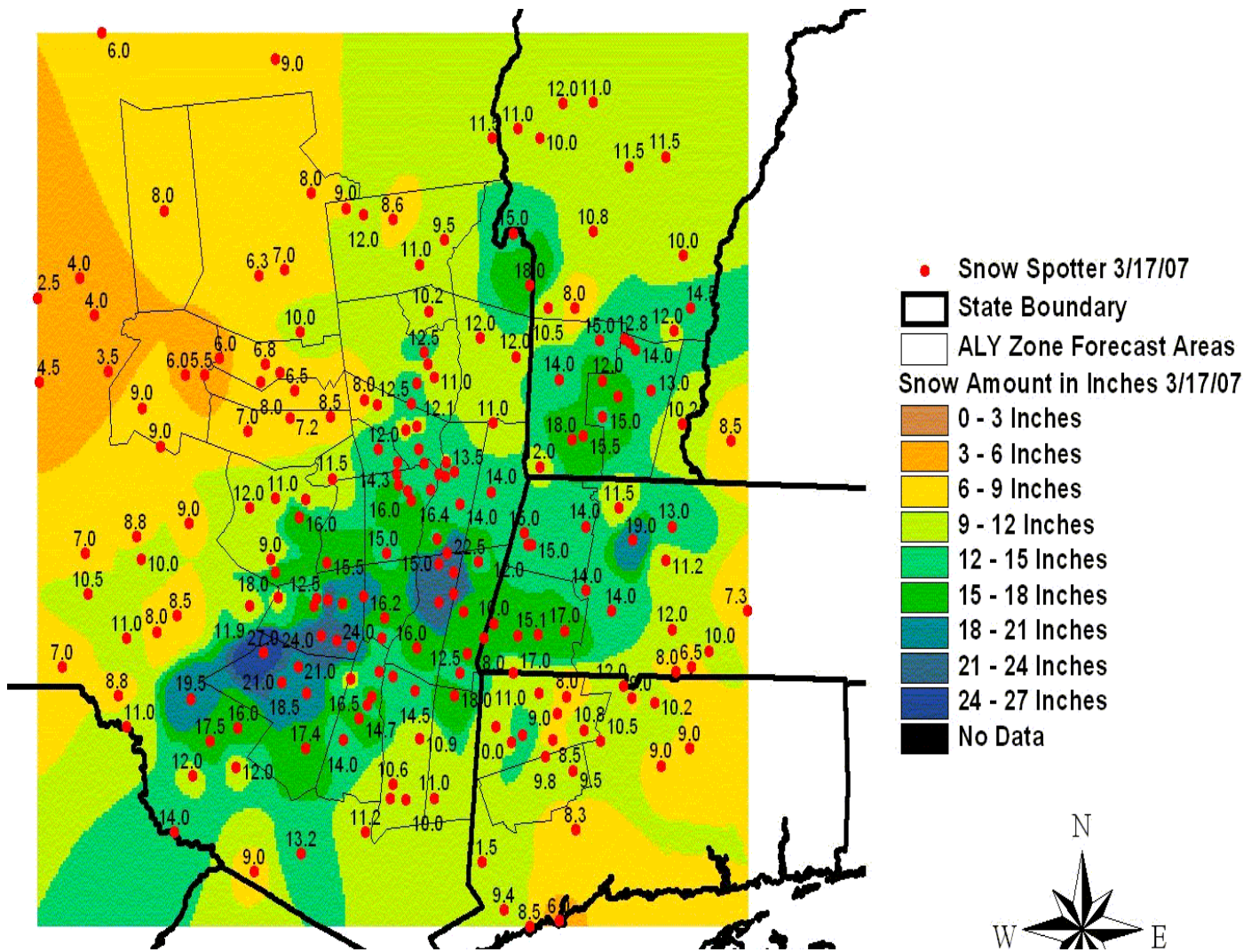


Figure C3. Observed snowfall for the St. Patrick's Day 2007 snowstorm (Image courtesy of John Quinlan, NWS Albany, NY).



## **THE WINTER OF '06-'07: LACKING IN SNOW**

*Evan L. Heller  
Climatologist, NWS Albany*

The Winter of '06-07 started out with above normal temperatures and well below normal snowfall, and ended snowier and colder.

December 2006 opened the climatological season as a much warmer than normal month. With a mean temperature of 35.2°, it tied for Albany's 7<sup>th</sup> warmest December. This mean is 7.2° above December's normal. The 42.9° mean maximum temperature for the month placed it in a tie for 3<sup>rd</sup> warmest mean maximum December temperature, and the 27.5° mean minimum temperature put it at 8<sup>th</sup> place for warmest mean minimum December temperature. These means are 6.9° and 7.4° above normal for December, respectively. Despite the December warmth, there were no daily records. The highest reading was 64°, on the 1<sup>st</sup>, the same date as the high minimum temperature reading of 41°. This also resulted in the 1<sup>st</sup> being the warmest day of the month, with a mean temperature of 52.5°. In contrast, the 8<sup>th</sup> was the coldest day of the month, with a mean temperature of 17.0°. A low for the day of 10°, and a low maximum of 24°, factored into the result. The temperature dipped to 32° or lower 23 out of 31 days during the month, and there were two days, the 8<sup>th</sup> and 29<sup>th</sup>, during which the temperature failed to rise above that value.

Snowfall for the month was miniscule, just 0.3", compared to the 12.8" normal. This came in three rounds of even more minute, 0.1" amounts, the first of these occurring on the 5<sup>th</sup>, when Albany received its first measurable snowfall of the snow season. Needless to say, there were no records. Precipitation was 0.75" below normal at 2.01", the vast majority of this amount falling as rain. There were 19 days during the month with a trace or more of precipitation, on 9 of which it was measurable. It was more than both a tenth and a quarter of an inch on 5 of those days. The 22<sup>nd</sup> recorded the most rainfall, 0.47".

There were 8 clear, 12 partly cloudy and 11 cloudy days in Albany during December. There was a thunderstorm on the 1<sup>st</sup>, and dense fog on the 14<sup>th</sup>. The average wind speed for the month was 7.9 mph, and the windiest day was the 2<sup>nd</sup>, with an average wind speed of 15.7 mph. The peak wind was 46 mph from the west on the 1<sup>st</sup>. The calmest day was the 31<sup>st</sup>, with an average wind speed of just 2.9 mph.

During the first month of the New Year, Albany experienced an overall cool-down, but temperatures were once again above normal. The mean maximum temperature for the month of 35.3° was 4.2° above normal, and the mean minimum temperature of 19.5° was 6.2° above normal, resulting in a monthly mean of 27.4°, which was 5.2° above normal.

This month, there were no temperature entries into Top 10 lists, but there were daily records...4 of them, and all centering on 2 days. On the 5<sup>th</sup>, the record high minimum temperature for the day was broken when the mercury failed to get down below the old record of 39° from 1909. In fact, it fell short by 10°, settling in at 49°. This helped result in a high mean temperature record for the day. The 52.5° mean for the day broke the 1950 record by 4.0°. The other two records occurred on the 6<sup>th</sup>. That was the day Albany had its first record high daily temperature in over a year. The 71° high reading shattered the 60° record from 1929, and yet another high mean temperature record resulted. The 57.5° mean for the day broke the 52.0° record from 1890. The warmest reading in January was indeed the record high value established on the 6<sup>th</sup>, with both the monthly high minimum and warmest day being the records from the previous day. The 26<sup>th</sup> was the coldest day, with a mean of 4.0°. Both the month's coldest reading, -3°, and its lowest maximum reading, 11°, were also recorded on this day. The -3° reading was Albany's first sub-zero reading in nearly two years. Twenty-five of the 31 days of January saw the mercury dip to the freezing mark or lower. And although there wasn't technically a deep freeze, there were a total of 14 days scattered about during which the mercury failed to climb above freezing.

Precipitation for January totaled 2.14", a slight improvement over the previous month, but still 0.57" below normal. Snowfall increased, too, but was still a scant 3.9", 14.1" below normal. Again, most of the precipitation fell in the form of rain. There were 24 days during which at least a trace of precipitation occurred, on 16 of which it was measurable. A tenth of an inch or more fell on 6 of these days, with 0.25" or more on 2 of those. The day exceeding a half an inch was the 15<sup>th</sup>, during which 0.74" fell. The most snowfall in one day, however, 1.1", occurred on the 19<sup>th</sup> of the month.

There were 9 clear, 11 partly cloudy and 11 cloudy days in January. There was dense fog on the 1<sup>st</sup>, and freezing rain on the 12<sup>th</sup>, 14<sup>th</sup> and 15<sup>th</sup>. The average wind speed for the month was 8.4 mph, and the peak wind was 47 mph from the west on the 20<sup>th</sup>. This helped make the 20<sup>th</sup> the windiest day with its 18.0 mph mean.

The calmest days were the 23<sup>rd</sup> and 30<sup>th</sup>. Both days recorded an average wind speed of 2.4 mph.

The tide turned in February, with the area's biggest snowstorm in over three years. 16.8" of snow fell during the Valentine's Day Storm of 2007, making it the 5<sup>th</sup> heaviest February snowstorm on record. It made up for a big part of the season's snow shortfall, but with no other major, or even minor, snow events during the month, the season remains below normal for snowfall. The 16.3" that fell at Albany on the 14<sup>th</sup> alone was still several inches short of the daily record of 23.5" that fell during the Valentine's Day Storm of 1914. That figure remains Albany's greatest February amount in any one day. The 23.2" total for February 2007 is 10.5" above normal, and is in a tie for 64<sup>th</sup> snowiest month on record.

February also turned much colder. The warmest reading was only 42°, and occurred on the 20<sup>th</sup>. The season's other sub-zero reading occurred this month, on the 19<sup>th</sup>, when the mercury dipped to -1°. This was the coldest day, with a mean temperature of 7.5°. The lowest maximum temperature, 13°, occurred on the 15<sup>th</sup>. The highest minimum temperature, 24°, occurred three times...on the 2<sup>nd</sup>, 27<sup>th</sup> and 28<sup>th</sup>. Two of these days, the 2<sup>nd</sup> and 28<sup>th</sup>, were the warmest days of the month, with mean temperatures of 31.0° apiece. February wound up being more below normal than January was above. The mean high temperature was 27.5°, 6.8° below normal, and the mean low temperature was 11.4°, 4.3° below normal. This resulted in a monthly mean of 19.4°, which was 5.6° below normal, and was in 57<sup>th</sup> place in the '100 Coldest Months record book'. Amazingly, all 28 days in February experienced a freeze. On 19 days, it never rose above freezing.

Precipitation totaled 1.54" in February, 0.73" below normal. This time, however, the vast majority of it fell as snow. There was precipitation during 20 days, with 7 days having it be measurable. A tenth of an inch or more fell on 3 of these days, and 0.25", on 2 of those. The day receiving more than a half inch was the 14<sup>th</sup>, which received 0.99".

There were 9 clear, 15 partly cloudy and 4 cloudy days in February. The average wind speed for the month was 9.2 mph, with the peak wind being 47 mph from the northwest on the 15<sup>th</sup>. This resulted in the date having the highest average wind speed, 16.4 mph. The 27<sup>th</sup> was the calm day, with a mean wind speed of just 0.7 mph.

So, the average high temperature for the season was 35.2°, and this was 1.4° above normal. The average low of 19.5° was 3.1° above, resulting in a seasonal

mean of 27.3°, 2.2° above normal. The 5.69" seasonal precipitation total was 2.05" below normal, and the 27.4" of snowfall was 16.1" below normal.

## ***NWS ALBANY HOLDS SECOND 'SPRING-UP' FIRE WEATHER CONFERENCE***

*Hugh W. Johnson IV*

*Fire Weather Program Leader, NWS Albany*

About a dozen wildfire specialists from agencies within New York, Vermont, Massachusetts and Connecticut flocked to Albany's second 'Spring-up' Fire Weather Conference on Monday, March 12<sup>th</sup>. NWS Albany's MIC, Gene Auciello, opened the conference with a warm welcome. I led the discussions, assisted by our Warning Coordination Meteorologist, Ray O'Keefe, and both my outgoing and incoming Assistant Fire Weather Program Leaders, Ellie Kelch and Evan L. Heller. I reviewed the fire weather season of 2006, noting that there was an active start with plenty of brush fires, and even a Red Flag Warning. A change in the weather pattern then led to a very wet late spring and early summer, and an end to the fires. But despite drier weather the second half of the summer, fire activity remained not all that problematic. I discussed changes made since last year's fire weather curriculum, including the addition of a mandatory synopsis, issued with each of our twice-daily Area Forecast Discussions (AFDs), so that our users can get 'the big picture'. The Fire Weather Discussion can then be used to hone in on a particular weather system's impact on fire behavior. Also, mixing heights and the Haines Index are now calculated in 3-hour increments, which should more consistently represent current atmospheric conditions. Use of the Spot Request program via the internet was also reviewed. Some questions about the Red Flag Warning program arose, most notably: What should the temperature threshold be for issuing a Red Flag Warning?, and; How many rain-free days are needed before we should consider one? I stated that our forecasters have been encouraged to determine, via our users, the actual fire danger in all of our area before considering the issuance of any Red Flags.

Afterward, I led a round-table discussion with the attendees expressing various fire-weather-related concerns. One biggie was whether or not to follow suit with some of our surrounding offices (Boston, New

York and Binghamton), and extend our fire weather season to year-round, despite the realization that once the dead of winter sets in, there's generally no need for further fire weather products or information for our area. I stated that folks affiliated with a government agency can always request a 'Spot Forecast'. It was argued that our season window could at least be extended to begin March 1<sup>st</sup>, and last through December. The start date could be delayed if our area was to become 'buried' in snow. Thus, an agreement was reached at the meeting to use a flexible March 1-December window. Last, but not least, some users expressed a desire to have two (2) fire weather issuances per day, instead of just the one with the morning forecast package. With the forecast database being updated twice a day, I offered the inclusion of a second Fire Weather Discussion with the afternoon forecast package. This, along with the National Fire Danger Rating System Point Forecast, would provide enough information to cover the following day. The attendees viewed the idea favorably.

Overall, those present had positive things to say about our program, and would like us to keep up the good work. We will next meet in the fall, and this will probably be the meeting for the Fire Weather Compact, the exact date of which has yet to be determined. You may address all pertinent questions and concerns to me, [Hugh.W.Johnson@noaa.gov](mailto:Hugh.W.Johnson@noaa.gov).

## ***NWS INTRODUCES ENHANCED FUJITA SCALE***

*Raymond G. O'Keefe*

*Warning Coordination Meteorologist, NWS Albany*

On February 1, 2007, the National Weather Service introduced a new scale to measure tornado intensity – the Enhanced Fujita Scale (EFS). The late Dr. Ted Fujita first introduced the Fujita Scale (FS) to rate tornado intensities, in 1971. On the FS, tornado intensities were rated Weak (F0 or F1), Strong (F2 or F3) or Violent (F4 and F5). Every U.S. tornado, beginning with the Super Outbreak of 1974, has been assigned an FS rating. In order to establish a tornado climatology, a retrospective study assigned FS ratings to all U.S. tornadoes back to 1950.

The FS has proved beneficial in establishing tornado climatologies, and assessing tornado intensities. Here within the National Weather Service Albany Forecast Area, 138 tornadoes have occurred since 1950.

Regionally, most tornadoes – 78% – have been Weak, although 20% were rated Strong, and two percent made it to Violent. The strongest tornadoes recorded in the Albany Forecast Area were: two F4s in Berkshire County, Massachusetts – the first in 1973, the second in 1995, and; two F4s in New York – one in 1973 in Columbia County, and another in 1989 that skipped across Montgomery, Schoharie, Greene and Albany Counties.

So, with the FS seemingly working well, why do we need to change it? Well, problems have been identified with the system over the years. The primary limitations were: a lack of damage indicators; no accounting for construction quality and variability; no definitive correlation between damage and wind speed; difficulty in application when no damage has occurred (i.e., with a tornado moving across an empty field), and; overestimating of wind speeds greater than F3 intensity.

With these limitations in mind, meteorologists and wind engineers set about devising a new tornado scale. Certain ideas were agreed to by the experts. First, there must be a correlation between the original FS and the new scale, which makes it possible to express ratings in terms of one scale or the other, thus preserving the historical database. Second, damage assessment needed to be consistent, allowing not only structures, but also vegetation, to be evaluated. Finally, damage analysis at the tornado scene should be methodical and rigorous.

From these basic considerations, the Enhanced Fujita Scale emerged. An EFS rating is assigned to a tornado after first determining the type(s) of structures impacted by it. The new system offers a comprehensive list of 28 structures (e.g., single-family home, double-wide mobile home, shopping mall), and the typical construction for each. The next step is to estimate the degree of damage through observation. Once this step is completed, an 'expected wind speed', and an upper and lower bound wind speed, can be estimated. The EFS is then assigned a rating of 0 to 5, similar to the old FS, based on the expected wind speed.

Let's see how the EFS tornado rating system would work in practice. Here's a photo of tornado damage that occurred during the May 31, 1998 tornado outbreak across Saratoga, Albany, Rensselaer, Washington and Bennington Counties.



## ***THE MARCH 2, 2007 MIXED PRECIPITATION EVENT***

*Neil A. Stuart*

*Senior Meteorologist, NWS Albany, NY*

*and*

*Ingrid Amberger*

*Senior Meteorologist, NWS Albany, NY*

The storm of March 2<sup>nd</sup>, 2007 was a messy event that produced a mix of snow, sleet, freezing rain and rain across the area. It was the result of a weather pattern across North America that had moderated during the last two weeks of February, to a more normal and stormier pattern. This is the storm that produced the deadly tornadoes across the Midwest and southeastern U.S. (Figure 1). However, across the northeastern U.S., Canadian high pressure kept cold air in place, resulting in the snow, sleet, ice and rain.

Low pressure formed over the deep south by Wednesday, February 28<sup>th</sup>. The low strengthened and headed northeast toward the Upper Midwest/Great Lakes region on Thursday. By Friday morning, March 2<sup>nd</sup>, deep low pressure was located over the western Great Lakes, with secondary development occurring along the mid-Atlantic coast. The inland low over the Great Lakes remained the primary low during this event. The thermal structure associated with this event was very complex. With the primary low passing to our west, the region was located on the warm side of the system, allowing warmer air to, at first, move in aloft, and then, filter in at surface-level, across much of the region.

A band of snow developed and moved into the region during the late afternoon and evening of March 1<sup>st</sup>. However, the low levels were so dry that most of the precipitation did not reach the ground. During the late evening, just prior to midnight, the leading edge of the deeper moisture rapidly spread north and east across our region.

The forecast models were in much less agreement for this storm than for the Valentine's Day storm. A wide variety of solutions for precipitation type and duration made for an extremely difficult forecast even 12 to 24 hours before the storm impact. Slight shifts in precipitation zones and duration made the difference between a major snow, sleet or ice storm, and a mostly cold rain event.

The greatest impacts from winter weather during this storm took place in the Adirondacks, Lake George

Our first step is to determine what type of structure we are looking at. We can see it is a single-family home, or 'FR12' in the EFS nomenclature. Next, we assess the degree of damage on a scale of 1 to 10. The description for damage rating 6 is "large sections of roof structure removed; most walls remain standing", while level 7 requires "Top floor exterior walls collapsed". The photographic evidence suggests we might be somewhere between levels 6 and 7. I would call it a level 6, since only the front exterior wall seems to have collapsed. Our 'degree of damage chart' tells us that for level 6, the expected wind speed is 122 mph. Wind speeds of this magnitude yield an EFS rating of 'EF2'. Had we chosen the level 7, this would have yielded an expected wind speed of 132 mph, still in the EF2 range. So, based on our analysis, we would rate the damage at this specific location as 'EF2'. Of course, damage may have been worse at other locations.

David Johnson, Director of the National Weather Service, sums up the benefits of the new system, noting "The EFS scale still estimates wind speeds, but more precisely, takes into account the materials affected, and the construction of the structures damaged by the tornado."

For more information, including damage scales, see the following web site:

<http://www.spc.noaa.gov/efscale/>

Region, Green Mountains, western Mohawk Valley, Schoharie Valley and northwestern Connecticut. Snow and sleet added from 7 to 14 inches to the mountains, and ½” or more of ice fell in the western Mohawk Valley (Figure 2), Schoharie Valley and northwestern Connecticut (Figure 3). Mixed precipitation transitioned to a cold rain everywhere else, including the Capital District. The combination of moderate to heavy rain and blocked storm drains resulted in minor urban flooding by mid-morning across the Capital District, and parts of the Mohawk Valley, Catskills, Taconics and northwestern Connecticut.



Figure 2. Ice accumulation of up to ½” near Amsterdam, NY on March 2, 2007 (Image courtesy of WTEN-TV Albany, NY).

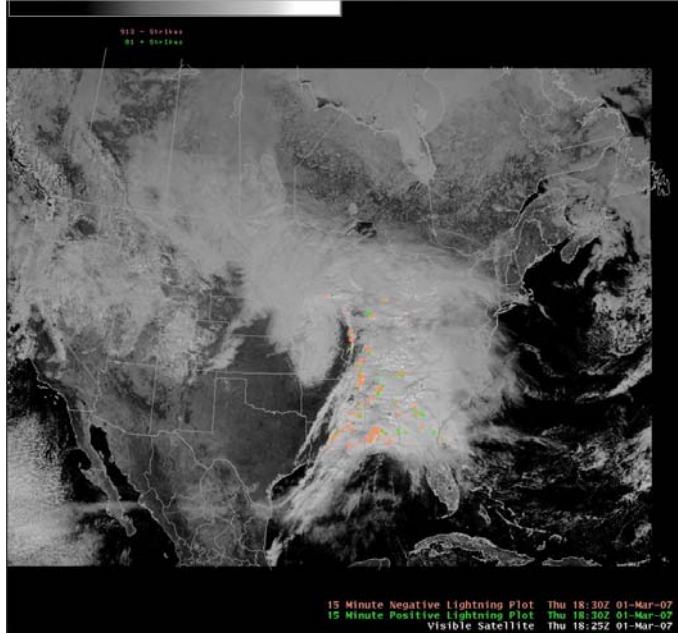


Figure 1. Satellite picture, from the afternoon of March 1, of the approaching storm with lightning strikes overlaid. Note the tornado-producing thunderstorms in the Midwest and southeast U.S.



Figure 3. Road crew working on downed tree branches and wires near Burlington, Connecticut after ½” or more of ice fell on March 2, 2007 (Image courtesy of WFSB-TV Hartford, CT).

**SPRING SKYWARN  
REFRESHER COURSES  
ARE AVAILABLE.**

**SEE PAGE 15 FOR  
DETAILS.**

**RADIOS ALONG THE MOHAWK**

*Timothy E. Scrom*  
*Observing Program Leader, NWS Albany*

It was a dark, rainy and foggy night in the Capital District. I was working the 2 to 10 PM hydrology shift. My name is Tim Scrom. I was a ‘Hydro Tech’ back then. It had been raining most of that mid-March day. By 7 PM, a light drizzle lingered over the region. The temperature had been up into the 50s, but was settling back into the lower 40s by now. River ice had been moving along the Mohawk River during the day and into the late afternoon.

At 7 PM, I started the routine call-up of river gages. Back in the late 70s, the river gages were mostly 'beepers' – devices along the river that provided, via a count of beeps over the phone, their river stages. Because our River District, as it was called back then, extended from around Binghamton, New York across the Capital District, and into Vermont, we had many river systems to monitor.

By 8:30-ish, I had completed all of my routine outgoing calls, and had taken all the incoming cooperative observer calls that had come in for the night. Now I was ready to 'cut a tape' – the process whereby we typed data into the ASR 33 teletype machine, and created a paper tape full of computer data holes. This data was then fed back into the old ASR 33 teletype, and entered on a time-share computer system. By 9:15 PM, the tape was cut, and the data had been sent to the River Forecast Center (RFC), which was located in Hartford, Connecticut.

Since things were pretty quiet (or so I'd thought), the new river forecasts were out from the RFC by 10:30 PM. I was lucky tonight! I'd get the late night forecasts and statements out by the start of the 11 o'clock news cycle. Then I could leave!

As I was walking down the hallway to the stairwell, I decided to take a quick detour to Jumpin' Jack's in Schenectady. I had some free time, as I didn't have to be back in to work until 2 o'clock the following afternoon, and that was mainly to clean up the paperwork pertaining to the storm.

I jumped into my car; it was easily identifiable...a 1979 Z-28 with red lights, sirens and plenty of antennas. Not something you see on the street every day. It was about midnight when I pulled into the parking lot of Jumpin' Jack's to watch the ice go by.

Within a few minutes, an older model jeep pulled up alongside me. It also had several antennas scattered around the roof, bumpers and fenders. From the dim light inside the jeep, I could identify the person inside as a male, wearing a CPO jacket with a knit cap, and he was heavily bearded. Could it be that there was another nut who liked to watch ice float by? No way!

But the antennas? Obviously, he wasn't there to do ill deeds at a local seasonal eatery. After a few minutes, he rolled down his window and asked, "Whatcha doing?" I replied, "Watchin' ice float by". After a few more minutes of small talk, this stranger asked if I wanted to sit in his jeep and watch the ice. A strange offer, indeed. But with all those antennas, he couldn't be that bad, right? So, I grabbed my radio and

agreed to watch the ice with him. As I slid into the front passenger seat, I could see several radios were on, with cables running in, on and through the front seat, and into the rear of the vehicle. On the dash was taped the following: "AK2E".

From my younger days watching my uncle work his radios, I realized this was an Amateur radio operator. By 12:45 AM, I had discovered that I was sitting in Hal Post's vehicle, and that he was watching the ice for the Schenectady County Office of Civil Defense. I also learned that there were several other 'ham' radio operators scattered along the river from Tribes Hill to Lock 7.

Around 1 AM, a voice identified as "K2AE Schenectady County Civil Defense Office" came over the radio. I recognized the voice as that of Stan Rawzewski, director of Civil Defense for Schenectady County. Stan stated "Boys, we're on our own, the Hydrology people at the Weather Service went home for the night". Then without hesitation, Hal Post got on the 'ham' radio and announced, "AK2E to K2AE, the Weather Service didn't go home, they just relocated to the front seat of my truck".

Over the next several hours, I worked the ice (jam?) event from the front seat of Hal's truck. I carried copies of the Unit Hydrographs – paper charts we use to model river behavior, in my car. So, having both the graphs and Hal's observers along the river provided the data that the NWS needed in order to monitor that night's flood potential.

A few days later, the Meteorologist-In-Charge of our office at the time came and questioned me about a letter of thanks he had received. He couldn't understand why I'd worked that night at the Schenectady Emergency Operations Center (EOC). So, I explained what had happened.

From that night along the river, we formalized the Mohawk River Watch program. By 1982-83, the program was transformed into SKYWARN – for Eastern New York. We were the first SKYWARN program in New York State, and the first along the East Coast. We also became one of the first SKYWARN programs in the nation to incorporate severe weather and river ice reporting. The SKYWARN identification code that we developed back in those days is still in use today, and has been copied by a number of other offices.

From that initial group of 'Ham Radio Operators' was created the Capital District Weather reporting network, which is still in operation today. That same group also had a hand in creating the

Mohawk River Consortium, which helped unify, and further coordinate, the various SKYWARN programs across the Mohawk Valley. And, many of those early operators went on to participate in John Quinlan's Snow Study, which led to the creation of new operating modes for the Weather Service's Doppler radar system.

I don't remember if we actually had any ice jam or flood problems that night, but some of us old-timers still reminisce about that first night with the "Radios Along the Mohawk".

### **SPRING 2007 BASIC/REFRESHER SKYWARN SPOTTER TRAINING SESSIONS**

*John S. Quinlan*  
*SKYWARN Training Coordinator, NWS Albany*

<i>Date</i>	<i>Day</i>	<i>Time</i>	<i>County</i>
<i>City or Town</i>			
<i>Location</i>			
4/04/07	WED	7:00-9:00 PM	ALBANY COUNTY
ALBANY, NY CESTM, 1 <sup>ST</sup> FLOOR AUDITORIUM 251 FULLER RD.			
4/10/07	TUE	6:30-8:30 PM	LITCHFIELD COUNTY
TORRINGTON, CT TORRINGTON CITY HALL, 2 <sup>ND</sup> FLOOR AUDITORIUM 140 MAIN ST.			
4/11/07	WED	6:30-8:30 PM	HERKIMER COUNTY
HERKIMER, NY 911 CENTER HERKIMER COUNTY COMMUNITY COLLEGE 71 RESERVOIR RD.			
4/16/07	MON	7:00-9:00 PM	SCHOHARIE COUNTY
SCHOHARIE, NY PUBLIC SAFETY FACILITY, 2 <sup>ND</sup> FLOOR EMO TRAINING ROOM, 1 DEPOT LANE			
4/19/07	THU	6:00-8:00 PM	SARATOGA COUNTY
CLIFTON PARK, NY CLIFTON PARK-HALFMOON PUBLIC LIBRARY, ROOM A 475 MOE RD.			
4/21/07	SAT	10:00 AM-NOON	WASHINGTON COUNTY
FORT EDWARD, NY PUBLIC HEALTH TRAINING FACILITY YELLOW BUILDING BEHIND THE COUNTY ANNEX OFF BROADWAY			
4/23/07	MON	7:00-9:00 PM	MONTGOMERY COUNTY
FONDA, NY COUNTY EMO, COUNTY OFFICE BUILDING 64 BROADWAY			

4/24/07	TUE	7:00-9:00 PM	RENSELAER COUNTY
AVERILL PARK, NY TOWN HALL 8428 MILLER HILL RD.			
4/25/07	WED	7:00-9:00 PM	BENNINGTON COUNTY
BENNINGTON, VT BENNINGTON FREE LIBRARY 101 SILVER ST.			
5/01/07	TUE	7:00-9:00 PM	WARREN COUNTY
QUEENSBURY, NY WARREN COUNTY MUNICIPAL CENTER, EMERGENCY MANAGEMENT OPERATIONS ROOM IN THE BASEMENT			
5/02/07	WED	7:00-9:00 PM	ULSTER COUNTY
KINGSTON, NY HOSE #5 FIRE HOUSE 830 ULSTER AVE.			
5/07/07	MON	7:00-9:00 PM	SCHENECTADY COUNTY
NISKAYUNA, NY NISKAYUNA HIGH SCHOOL, CAFETERIA			
5/08/07	TUE	7:00-9:00 PM	WINDHAM COUNTY
TOWNSHEND, VT GRACE COTTAGE HOSPITAL EMS TRAINING ROOM 185 GRAFTON RD/ROUTE 35			
5/09/07	WED	7:00-9:00 PM	FULTON COUNTY
JOHNSTOWN, NY FULTON COUNTY FIRE TRAINING CENTER 133 SUN VALLEY RD.			
5/10/07	THU	7:00-9:00 PM	BERKSHIRE COUNTY
PITTSFIELD, MA PITTSFIELD EMERGENCY MANAGEMENT OFFICE 235 TYLER ST.			
5/12/07	SAT	10:00 AM-NOON	HAMILTON COUNTY
INDIAN LAKE, NY TOWN HALL, ASSEMBLY ROOM PELON RD.			
5/14/07	MON	7:00-9:00	GREENE COUNTY
CAIRO, NY GREENE COUNTY OFFICE OF EMERGENCY SERVICES, ROOM 126 25 VOLUNTEER DR.			
5/19/07	SAT	1000 AM-NOON	DUTCHESS COUNTY
EAST FISHKILL, NY EAST FISHKILL FIRE DISTRICT TRAINING BUILDING 2502 SR 52			
5/21/07	MON	7:00-9:00 PM	COLUMBIA COUNTY
HUDSON, NY NOECKER BUICK PONTIAC 92 UNION TURNPIKE/RTE. 66			

The Basic/Refresher SKYWARN Spotter Training Sessions are open to the general public, age 12 and over, and no prior knowledge is required. These sessions not only focus on severe local storms, but also train spotters on flooding.

SKYWARN is a nationwide network of volunteer weather spotters who report to, and are trained by, the National Weather Service (NWS). These spotters report many forms of significant or severe weather, such as severe thunderstorms, tornadoes, hail, heavy snow and flooding.

The staff at the NWS Forecast Office in Albany is responsible for issuing local forecasts and severe weather warnings for much of eastern New York, southern Vermont, western Massachusetts and northwest Connecticut. SKYWARN Spotters provide an invaluable service by providing ground truth on the atmosphere that we observe using radars, satellites and reporting stations. These spotters act as our eyes and ears in helping us provide quality forecasts and timely warnings. Check out the [National SKYWARN Homepage](#).

It's easy to join SKYWARN. All that's required is attending an enjoyable 3-hour training session. These sessions are offered in the spring for new spotters and those needing a refresher course, with advanced sessions offered in the fall. The sessions are held throughout our County Warning Area. Upcoming sessions are announced via NOAA Weather Radio, our webpage, and this on-line Northeastern StormBuster publication. The spotter network is usually activated whenever there's a threat of severe weather. This is usually preceded by the issuance of a Severe Thunderstorm, Tornado or Flood Watch, or some other type of watch. SKYWARN reports can be relayed from any location, be it at your office, on the road, or in your neighborhood. Information is relayed to the NWS via volunteer amateur radio operators, telephone and the internet.

Pre-registration is required for all SKYWARN Spotter Training Sessions. The preferred method for registration is via the internet. Go to [www.weather.gov](http://www.weather.gov), click on 'eastern New York', and look for the link to SKYWARN Spotter Training. If you need to pre-register by phone, please call 518-435-9580, then press '7', for SKYWARN Spotter Training. You will be asked to leave your name, a phone number, and the session you are signing up for. You must use a touch-tone phone. Once you've pre-registered, you will not receive a call back unless the session has been cancelled, moved, or is full.

*We said a fond farewell to an admired colleague as he entered retirement at the end of January after a long and distinguished career. When Kurt Hemmerich announced near the end of last year that he would be leaving the civil service after 40 years of dedication, I asked him if he would provide a summary of his career and experiences in the National Weather Service that I could include in the next issue of Northeastern StormBuster. Wow...did I ever get one! So here it is, from someone I consider a great writer. What an amazing 64 years!...and isn't it ironic that When I'm Sixty-Four was released by The Beatles the same year he began his career? We wish him all the best! He'll be missed.*

### ***KURT HEMMERICH: MY LIFE AND CAREER- AN AUTOBIOGRAPHICAL RETROSPECTIVE***

*Kurt Hemmerich  
Senior Forecaster, NWS Albany*

My career in the National Weather Service spanned a period just shy of 40 years, and fulfilled half of a boyhood dream.

During my formative years in Larchmont, New York in the 1950's, my interests led me toward two possible careers: one having something to do with weather, and one involving fishing. The fishing interest evolved from my first trip to the 'duck pond' to catch sunfish, through my teen years pursuing striped bass and bluefish on Long Island Sound. The weather interest followed from the infrequent snowstorms I experienced in the warm part of New York State in which I lived.

My mother cultivated my interest in weather by getting me simple books on the subject. I followed these with making crude weather instruments, applying the rules of thumb in these books to my own weather forecasts. On a daily basis, I was glued to the TV, watching Uncle Weathbee (Tex Antoine) do his five-minute weather broadcast from New York City. It was during a science film in Junior High School that I had an epiphany of sorts. The film was about weather forecasting, and depicted animations of high and low pressure systems, and the associated frontal boundaries. A strange but delicious chill went through me as I watched the film. I was destined to be a weather nut.



After graduating from high school in 1961, I applied to several colleges. Some provided degrees in meteorology, others in marine biology. When my college acceptance notifications came, the first to arrive was from a meteorology school. My fate was sealed.

I entered the National Weather Service in April of 1967, after graduating from Pennsylvania State University with BS and MS degrees in meteorology. My first duty location was Anchorage, Alaska, where I worked for 9 months before meeting my two-year military obligation. I resumed my job in Anchorage in March of 1970.

My second tour of duty in Alaska lasted through the summer of 1972. It was during this period that I had the most exciting assignment of my career. In 1970, while working with the fire weather forecasting unit in Anchorage, I was assigned to Fairbanks for the summer. In Fairbanks, I lived in a small travel trailer with my wife and our dog. I was responsible for an early morning briefing of Bureau of Land Management personnel.

The BLM was coordinating an experimental project with a private cloud seeding contractor. The goal of the project was to seed convective clouds in an effort to cause them to rain on forest fires. I was bathed in Alaskan summer twilight as I arrived at the office around 3 AM to prepare for the briefing. Preparation involved using the latest surface and upper air observations to construct forecast soundings, and surface pressure, temperature and dew point analysis charts. From these, an attempt was made to determine the location, depth and time of occurrence of any convective clouds that would form later in the day. After giving my briefing, I would fly across Alaska in a chartered Lear Jet with one or more members of the BLM team to observe locations where I expected convection to occur. When the building clouds were confirmed, seeding aircraft were dispatched to the area.

It was on these flights that I was especially impressed with the varied beauty of this portion of the world, with its majestic mountains, broad rivers, lakes, extensive forests and tundra. Because of the marvelous beauty of the landscape, and my attraction for the outdoor activities that Alaska afforded, it was with sadness that I left for the 'lower forty-eight' late in the summer of 1972. I arrived at Albany, New York, my second and final duty location, on the exceptionally hot day of September 19<sup>th</sup>. Severe thunderstorms occurred that afternoon and evening.

But it was not severe thunderstorms that impressed me during my 34 years as a weather forecaster in Albany. It was nor'easter snowstorms – the type of weather that, as a boy, had piqued my interest in weather and led me into a career as a weather forecaster. The storm that stood out far above all others in my 34 years in Albany was the snowstorm that blacked out much of the Capital District on Sunday, October 4, 1987.

That Sunday, after working the midnight shift, I left the Forecast Office at the Albany County Airport at 7 AM. It took me about 7 hours to make the 20-mile trip to my home in Averill Park due to unplowed roads and fallen trees. With the trees still full with leaves, wet snow quickly weighted many branches to the breaking point. Large limbs and trees toppled onto power lines. Some locations were without power for 2 weeks because of the storm. I was fortunate, losing power for only 18 hours, despite having 20 inches of snow on the ground in Averill Park. The previous record snowfall for the month of October at Albany was around 2 inches, and that occurred near the end of the month. This storm occurred barely a month after school had reopened, and almost 3 months before Christmas!

Another memorable event, but much less impressive than the October snowstorm, was the arctic outbreak that occurred on Christmas day in 1980. I arrived at work that Sunday morning in a howling wind with the temperature around 20 degrees below zero. When I returned home that evening, I found that some of the water pipes in my house had frozen.

Weather forecasting has evolved over my career. When I was in Alaska, satellite photos were just beginning to be used. Once a day, strips of polar-orbiting satellite photos were spliced together. An interpretation of the composite was used to determine the positions of cyclones, anticyclones and air mass boundaries. Before satellites, it was often impossible to even know if a storm that could impact Alaska even existed out over the Pacific Ocean. In 1967, forecasters were routinely surprised when a lone ship report suddenly revealed the existence of a powerful ocean storm.

In my opinion, the event that had the greatest impact on weather forecasting during my career was the invention of the microchip technology in the 1970's. I was skeptical when I heard on a news broadcast that microchips would change all of our lives. It goes without saying that my skepticism was totally unwarranted. The microchip led to the development of the powerful supercomputers of today that are employed

to make the massive mathematical calculations necessary to solve the atmospheric mysteries of Mother Nature. These calculations are manifest in the output of atmospheric models, information vital to a weather forecaster these days. Even with these tools, the atmosphere is so complex that, even today, forecasters are sometimes surprised at how poorly atmospheric models do in some weather situations.

I was blessed to have had the privilege to have worked as a forecaster during all these changes. There were growing pains for sure, but eventually the problems were ironed out. However, there's a part of me that longs for the olden days, a time when forecasting was more of an art than a science. It was more satisfying to verify an accurate forecast early in my career because the forecast represented more of the forecaster's individual effort than is the case today. The approach now is for more of a team effort that involves coordinating with forecasters from surrounding National Weather Service Forecast Offices. This procedure can impact one's forecast by blending it with the forecasts of others, as an effort is made to have a smooth transition from the forecast in one geographic location to the next. Today's forecasting techniques are more structured than they used to be. And because of the more accurate atmospheric model forecasts, they are definitely more accurate than they were years ago.

But while there is a lingering attraction for the way things were, I was pleased to work into the twenty-first century, because there is so much more weather information available now. So much in fact, that it is difficult to examine it all before the omnipresent time deadline looms. Thanks to the aforementioned microchip, computer displays put all forms of weather information literally at a forecaster's fingertips. A key press and voila, information is displayed before the forecaster in an instant. Forecast technology is now so sophisticated that forecasts are packaged into small pixels of information that allow anyone with the proper digital devices, such as a computer, to get a worded forecast for any location in the country, including wilderness locations.

Yes, forecasting has come a long way. And so have I. But at 64 years of age, it's too late to fulfill the other half of my boyhood dream: some sort of fishery career. So I'm content with sport fishing. Looking back, I could have gone either way -- weather or fish. Ironically, had I chosen a fishery career in the federal government, my path would still have led me to the Department of Commerce's NOAA.

I offer this advice to anyone seeking a career in weather forecasting. Much of it involves working a 24-7 schedule. If you're not prepared to work during all hours of the day and night, it might not be the career you envision it to be. To the very end, I was enthusiastic about the forecasting aspects of my job. It was the schedule that eventually did me in.

If I were pressed to briefly summarize my career, I would put it this way: *All I wanted to do is have some fun. And I had it!*

## **WCM Words**

*Raymond G. O'Keefe*

*NWS Albany Warning Coordination Meteorologist*

Several interesting and timely (a nice write up on the St. Patrick's Day storm) articles in this edition of Storm Buster. Looks like we have some budding headline writers for the tabloids – *Radios Along the Mohawk!* On Kurt Hemmerich's last day he issued his final Area Forecast Discussion with these words, "On a personal note...this product brings the curtain down on my 40-year career as a weather forecaster." Many people contacted our webmaster to inquire about Kurt and his plans. Well Kurt has penned an autobiography in this edition that will tell you everything you want to know about him. Skywarn training begins on April 4<sup>th</sup>. We will offer 19 sessions – one in each county within the NWS Albany forecast area. Consider taking a free spotter training class.

## **From the Editor's Desk**

I don't know about you, but I can't wait for the warmer weather. I just don't know what the Groundhog was talking about. Six weeks after he declared an early spring, we were still digging out of the snow, and enduring the cold. But then again, upstate New Yorkers and interior New Englanders are used to this sort of thing. We have some interesting articles dealing with the bizarre array of weather we've experienced throughout the winter season. As I write this, we are less than a half an hour away from the Vernal Equinox. Thus far, it looks like we may indeed be breaking the 'cold mold', and right away. A special thanks to all of our article contributors. We have a couple of first-timers. Enjoy the reading...and the warmer weather!