NORTHEASTERN STORM BUSTER

Emergency Manager & Storm Spotter Magazine

Spring, 2009 *- VOL. 14, NO. 2*
Evan L. Heller, Editor
Raymond O'Keefe, Publisher
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DEPARTMENTS

THE LEGACY OF AN ICE STORM

Hugh Johnson
Meteorologist, NWS Albany

December 2008 started out innocently enough: mild and dry. It then turned a bit colder but remained benign. However, by December 5th, long-range computer models were hinting at trouble ahead. They indicated a storm might impact our region with some sort of wintry precipitation.

By December 7th, shorter-range models continued to show a storm would be bearing down on us by the end of the work week. The storm that would clobber us was already producing unusual weather: like snow in Las Vegas!

Low pressure had worked across the southern tier of the U.S. At the same time, energy from a hyperactive northern jet stream joined forces with this "Dixie Storm" to form a formidable "Miller A" type storm that loaded up with Gulf of Mexico moisture, and made a turn up the eastern seaboard. High pressure from eastern Canada sealed our fate by wedging a shallow surface-layer of sub-freezing air over the Northeast while tropical moisture charged northward.

At this point, National Weather Service forecasters in Albany were confident about the track of the storm, and that it would bring a significant amount of precipitation. However, the type of precipitation remained in question.

Forecasters thoroughly examined the forecast model soundings, and the initial consensus was that more sleet than either freezing rain or snow would fall. The process by which sleet and freezing rain form are similar but not the same. Sleet is the result of melted, or partially melted, snow flakes that have fallen through a

warm layer (above freezing) high above the ground, then through a thick and cold-enough layer to re-freeze before hitting the ground. Freezing rain is also the result of snow flakes melting through a warm layer, but in this case, the layer is warm and thick enough so that rain drops do not re-freeze until they make contact with the ground or objects near it. The difference in temperature between freezing rain and sleet may be only a degree or two through the column of the atmosphere. However, the difference in impact between a sleet storm and an ice storm is huge. Sleet storms, while producing slick plowable roads, rarely cause power outages, as sleet (ice pellets) bounces off trees and power lines. Occasionally, ice pellets can short out transformers. Freezing rain, however, accretes on any and all surfaces, and can knock trees onto power lines, transformers, homes and roads.

Freezing rain started falling early on Thursday, December 11th. Initially, the rain froze on only metallic surfaces and untreated sidewalks. By late in the day, it had become obvious that enough ice would fall to produce widespread power outages. FEMA, SEMO and Emergency Managers were well-briefed by the National Weather Service on the impending hazard. As nightfall rolled in, heavy freezing rain, occasionally mixed with sleet and embedded thunderstorms, pounded our area. Ice began accreting at an alarming pace, despite surface temperatures being slightly above freezing in some cases. Much of the ice accretion was on surfaces just above the ground. Large branches were snapped off, and whole trees, uprooted, falling onto power lines. Power began failing by late Thursday evening, and the number of residences without power began escalating rapidly by early Friday morning. The freezing rain briefly turned to a little snow before ending, which brought down even more trees and power lines. Gusty winds brought down even more tree branches. Temperatures flirted with freezing, which, when combined with the gusty winds and a little December sunshine, shredded ice off trees, with the ice looking like shrapnel as it became airborne.

The number of customers without power peaked at over 250,000, nearly a quarter of the population of the entire Capital Region and adjacent western New England. The area from Clifton Park southeast to Niskayuna was hit the hardest. Further north and west, more sleet and snow fell, which spared these areas from significant power loss. This was the largest power outage in our area since the freak October 4th snowstorm in 1987. But unlike the 1987 storm, the power outages with this storm came with frigid temperatures, and people scrambling to find generators in an attempt to save their pipes and keep their unheated homes habitable. Unfortunately, improper use of a generator resulted in at least one death due to carbon monoxide poisoning. Hotels and motels quickly reached maximum capacity, and many shelters were opened by the American Red Cross.

About half of the National Weather Service Albany staff lost power at home, some for as many as four days! Nevertheless, National Weather Service members continued to work to produce accurate forecasts crucial to the power restoration effort. Full power restoration in our area, which involved teams of workers deployed from as far away as Michigan, took nearly a week, while in portions of New Hampshire, hit even harder by the ice storm, it took more than two weeks! Total damage from the storm was still being assessed as of March 19th, and is expected to exceed 25 million dollars! It may take more than a year to clean up the residual debris and damage from this storm.

While the December 2008 ice storm, with as much as an inch and a third of ice, was very bad, the Ice Storm of December 1964, which also crippled the Capital District, was slightly worse. Worse still was an ice storm that devastated a good chunk of the Appalachians in late January 2009, with up to three inches of ice accretion, power outages lasting several weeks, and scores of deaths. However, the worst ice storm on record took place over the North Country, and a large portion of Quebec and Ontario, in January of 1998. As much as six inches of ice virtually destroyed a large portion of the Canadian electrical grid, knocking out power to millions. Full power restoration was not realized for over a month, and many fatalities resulted.

Ice storms are arguably more disruptive and devastating than blizzards. Hopefully, our area will not have to endure another ice storm anytime soon.

SPRING SKYWARN TRAINING

Session information available at:

http://cstar.cestm.albany.edu:7775/skywarn/Talks.htm

NEW SYSTEM OFFERS EASY ACCESS TO UPCOMING NWS EVENTS

Raymond G. O'Keefe
Warning Coordination Meteorologist, NWS Albany

The National Weather Service Outreach & Educational Events System (NOEES) is a web-based system to keep you informed about all NWS outreach and educational events across the nation. In addition to searching for activities in your area, you can subscribe to RSS feeds. RSS feeds will allow you to automatically receive notice of NWS events through your personalized home page. The NOESS's web site can be accessed here: https://apps.weather.gov/outreach/events.php. Simply click on the state of interest for the latest scheduled events.

NWS Albany will be posting its SKYWARN training sessions on this web site. Figure 1 shows a list of upcoming NOESS events for New York.

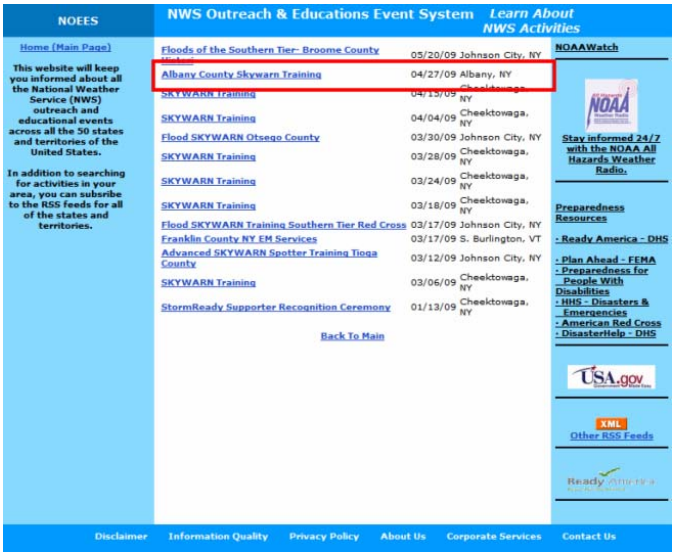

Figure 1. Recent NOEES listings for New York. The Albany County SKYWARN training for April 27 is highlighted.

Clicking on the Albany County SKYWARN Training listing yields more information, as shown in Figure 2.

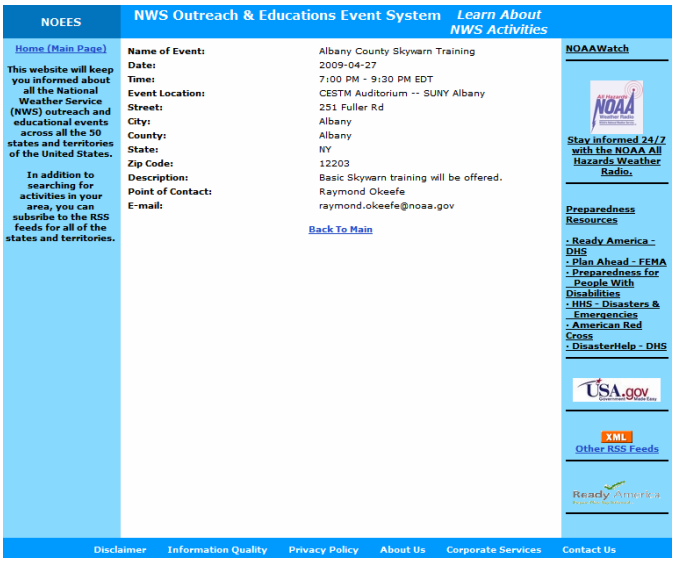

Figure 2. Details of the Albany County SKYWARN Training.

Additional SKYWARN training sessions will be added shortly. Check back to this site for listings of upcoming NWS events.

YOU CONTROL THE WEATHER

Ingrid Amberger
Senior Meteorologist, NWS Albany

There are many ways to view your National Weather Service (NWS) weather forecasts on the web (Figure 1 - www.weather.gov/albany): Point and Click, Text, At-a-Glance, Digital/Tabular, Images, Graphical, Interactive, and Activity Planner. All the same weather information, available in a format that works best for you and your needs. Two options offer tremendous flexibility: the Interactive Point Forecast - Hourly Weather Graphs, and the Activity Planner.

SPRING SKYWARN TRAINING

Session information available at:

http://cstar.cestm.albany.edu:7775/skywarn/Talks.htm

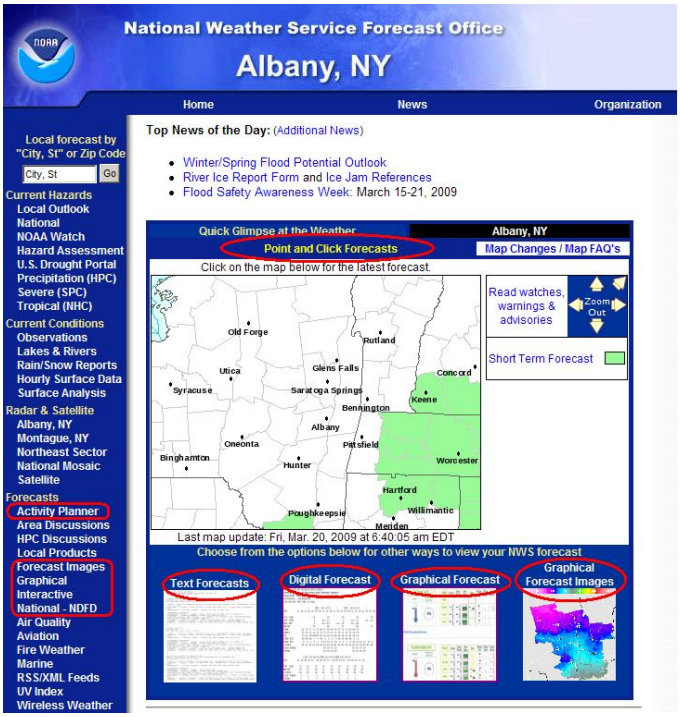

Figure 1

The Interactive Point Forecast - Hourly Weather Graphs option allows you to choose the weather parameters that interest you: Temperature, Dew Point, Wind Chill, Wind, Relative Humidity, Sky Cover, Weather and Precipitation Potential (Figure 2 - www.erh.noaa.gov/forecast/gridpoint.php?site=aly). Once you have decided on the parameter(s) you want a forecast for, choose the Hourly Weather Graphs option from the drop down menu (red arrow), then click on the interactive map for the location you are interested in.

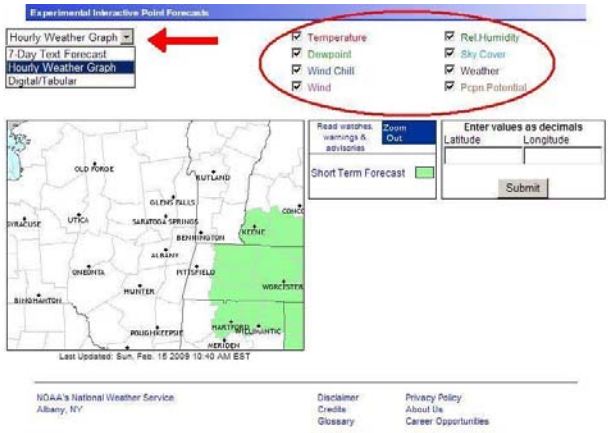

Figure 2

Your customized 4-day weather forecast is generated directly from the National Weather Service's digital database (Figure 3). Your forecast will be displayed in a graphic hourly format (element meteorogram) for the parameter(s) you've chosen. Temperature parameters: temperature, dew point and wind chill will all be displayed together; wind speed and direction, and gusts, if any, will all be displayed together, and; relative humidity, precipitation potential and sky cover will all be displayed together.

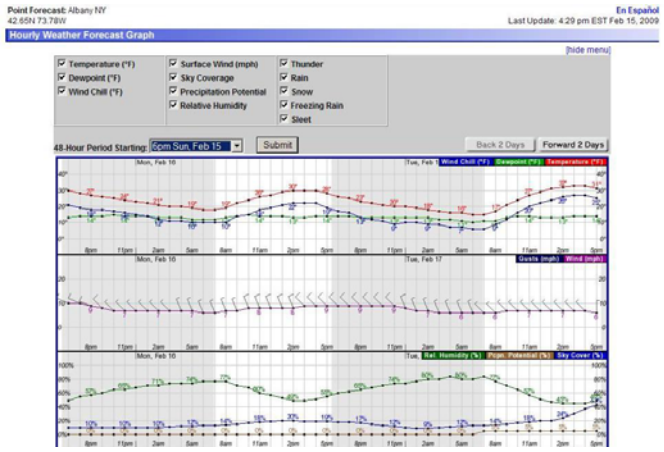

Figure 3

The chances for thunder, rain, snow, freezing rain and sleet will be displayed individually (Figure 4). Slight chance = 20%, Chance = 30-50%, Likely = 60-70%, and Occasional = 80-100%. Overlaid over the rain and snow graphs will be amounts of rain and/or snow expected for the given 6-hour period.

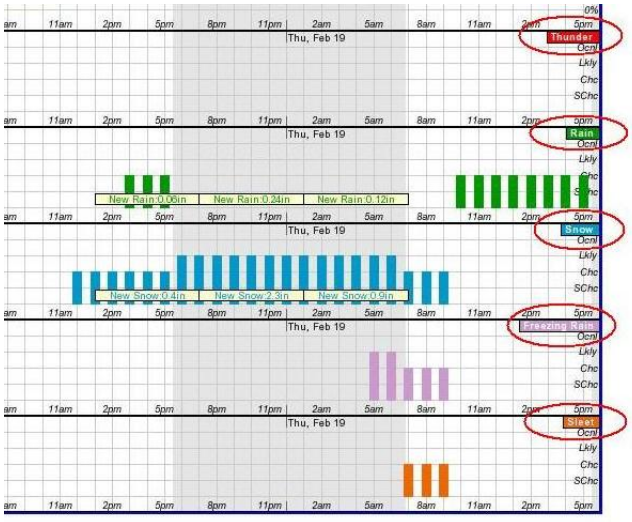

Figure 4

If you click anywhere on the hourly weather graphs, you will get the forecast in a tabular format (Figure 5), just another way to view your forecast.

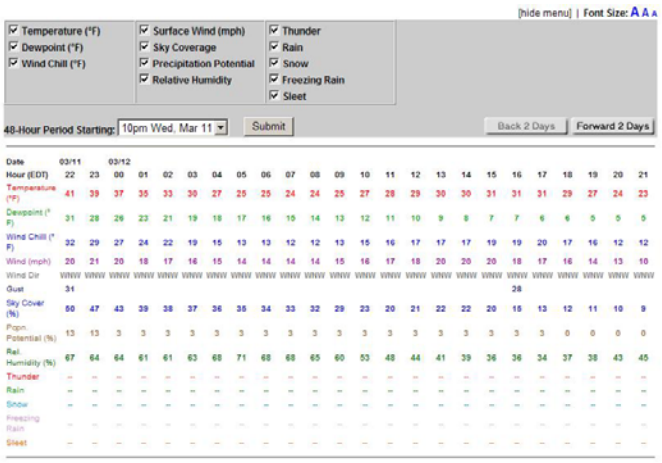

Figure 5

The Activity Planner (Figure 6 – http://forecast.weather.gov/wxplanner.php?site=aly) is intended to allow you to define your forecast for general planning. The planner not only allows you to choose the weather parameters: temperature, dew point, heat index, wind chill, relative humidity, surface wind speed, surface wind direction, sky cover and/or precipitation potential, but also allows you to define the weather you are looking for, or are trying to avoid, for the next 7 days.

SPRING SKYWARN TRAINING

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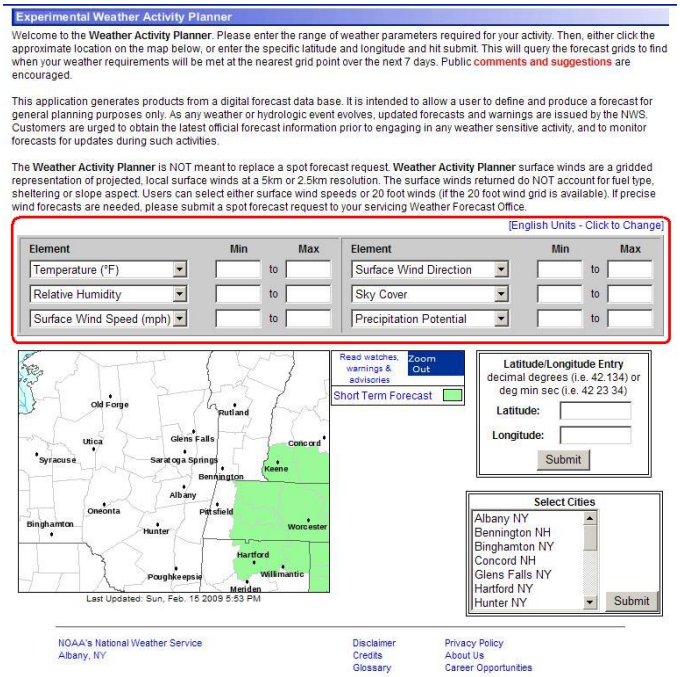

Figure 6

In the example in Figure 7, the temperature parameter was defined for 32 degrees Fahrenheit and below. The times the temperature meets this criteria are highlighted in the displayed chart. In addition, as you move your cursor over the chart, the hourly temperature and its time are displayed (red rectangle) for you. As with hourly weather graphs, if you click anywhere in the chart, it will take you to the forecast in a tabular format (refer to Figure 5).

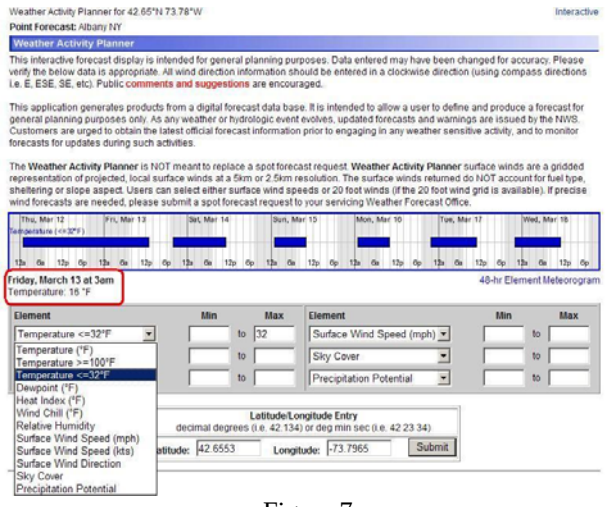

Figure 7

The more you use and experiment with the different ways to get your NWS forecast, the better you can tailor the forecast to meet your needs. If you have questions, please e-mail the NWS Albany webmaster at aly.webmaster@noaa.gov. A link for the webmaster's e-mail address can be found at the bottom of most web pages.

ONLINE RADAR IMAGERY UPGRADE

Brian Montgomery
Senior Meteorologist, NWS Albany

Over the past several months, National Weather Service web developers have been hard at work with advancements in radar imagery delivery online. This system, known as RIDGE (**R**adar **I**ntegrated **D**isplay with **G**eospatial **E**lements), has been displayed on National Weather Service web pages during the past several years, and can be displayed on mobile devices and Google Earth. The RIDGE Version 2 BETA will differ from the current online resource by using a national mosaic as the primary page, with user-selectable views and warnings. National Weather Service web developers are anxious for feedback on this new RIDGE system, and encourage you to visit http://www.srh.noaa.gov/ridge2/ to take a test drive. Perhaps you would like to learn a little more about Doppler Radar technology. Doppler University is an online extension of Jetstream, online school for weather, which can be accessed at:
http://www.srh.noaa.gov/jetstream/doppler/doppler_intro.htm

WINTER 2008-09: NEAR NORMAL AND SHORT ON RECORDS

Evan L. Heller
Climatologist, NWS Albany

It was a fairly typical Albany winter, overall. The average temperature was less than a half degree below normal (Table 1), and snowfall was only about six inches above what is expected for the three full months of climatological winter. With the precipitation having been slightly below normal, much of the snow was of the light, fluffy nature, making it fairly easy to clear off of vehicles and driveways. Our only daily records were those for snowfall, and these occurred early on in the season (Table 3a). One of these two December records, on the 21st, replaced one from two centuries ago (1887), by about an inch. This was preceded two days earlier by the season's first snowfall record, which became our greatest calendar-day snowfall of the season, 7.8". The previous record for the 19th was just 4.2", from 1986.

Indeed, December ended up providing more than half of the snowfall received during the three-month period (Table 1). In stark contrast, February was super-dry (6th-driest February on record (Table 3c)), with less than half the amount in the entire month that December received in just one of three particular days (Table 2). By the end of winter, the ground in Albany was bare.

For the month as a whole from a climate records perspective, December did not leave a major mark on Albany…except, of course, for the ice storm of December 11th-12th. This event will likely remain engrained in the memories of many northeasterners for years to come. Many areas experienced power outages and significant damage to trees and property. Freezing rain was recorded again on the 17th and 24th, and three more times in January (Tables 4a-c), but none of these events had quite the impact the first one did.

Temperatures were close to normal in December, colder than normal in January, and warmer than normal in February (Table 1). Interestingly, both the average high and average low temperatures for December were 0.4° above normal. For both January and February, however, the departures of the average low temperatures from normal were about a degree and a half warmer than the departures of the average high temperatures from normal. While the winter wasn't an especially cold season, the month of January was tied for the 44th coldest month in Albany, which is pretty significant given Albany has gone through about 400 or so winter months since the beginning of accurate temperature record-keeping in 1874. There was no major winter thaw in the New Year. Two days in December recorded the season's warmest reading of 58° (Table 1), and January 16th recorded the coldest reading of the season, -8°. This was also the coldest date, and the date with the coldest high temperature. Table 2 reveals that five dates in January recorded all the season's below-zero readings.

Tables 4a-c show that while partly cloudy days easily outnumbered both clear and cloudy days this past winter, clear days held a slight advantage over cloudy days. All three months experienced a peak wind greater

than 40 mph, but average wind speeds for the season were pretty close to normal. In Table 2, we see that precipitation fell on more than two-thirds of the winter days, with measurable precipitation on 43% of the days. There was only one day with over an inch of water-equivalent precipitation, this being with the ice storm, on the 12th of December. The two-day total from the storm was actually a whopping 2.05"! While December left us with only two daily snowfall records, the ice storm was clearly the highlight of the month…and of the entire season.

STATS

	DEC	JAN	FEB	SEASON
Avg. High/Dep. From Norm.	36.4°/+0.4°	26.4°/-4.7°	36.0°/+1.7°	32.9°/-0.9°
Avg. Low/Dep. From Norm.	20.5°/+0.4°	10.2°/-3.1°	18.9°/+3.2°	16.5°/+0.1°
Mean/ Dep. From Norm.	28.4°/+0.4°	18.3°/-3.9°	27.4°/+2.4°	24.7°/-0.4°
High Daily Mean/date	47.5°/28th	34.0°/23rd	42.0°/27th	
Low Daily Mean/date	12.0°/20th	3.0°/16th	9.0°/5th	
Highest reading/date	58°/15th & 28th	42°/23rd	51°/11th & 27th	
Lowest reading/date	49°/19th	-8°/16th	1°/6th	
Lowest Max reading/date	3°/31st	14°/1st & 16th	16°/5th	
Highest Min reading/date	37°/28th	26°/23rd	36°/12th	
Ttl. precip./Dep Fm. Norm.	4.54"/+1.78"	2.24"/-0.47"	0.64"/-1.63"	7.42"/-0.32"
Ttl. Snowfall/Dep. Fm.Norm.	27.5"/+14.7"	19.4"/+1.4"	2.5"/-10.2"	49.4"/+5.9"
Maximum Precip/date	1.24"/12th	0.81"/28th	0.26"/18th	
Maximum Snowfall/date	7.8"19th	5.9"/28th	2.1"/18th	

Table 1

NORMALS, DAYS & DATES

	DEC	JAN	FEB	SEASON
High	36.0°	31.1°	34.3°	33.8°
Low	20.1°	13.3°	15.7°	16.4°
Mean	28.0°	22.2°	25.0°	25.1°
Precip	2.76"	2.71"	2.27"	7.74"
Snow	12.8"	18.0"	12.7"	43.5"
TEMP. DAYS				
High 90º or above	0	0	0	0/90
Low 70º or above	0	0	0	0/90
High 32º or below	12	25	7	44/90
Low 32º or below	28	31	26	85/90
Low 0º or below	0	5	0	5/90
PRECIP. DAYS				
Days T+	22	21	19	62/90/69%
Days 0.01+	18	10	11	39/90/43%
Days 0.10+	12	5	6	23/90/26%
Days 0.25+	6	3	3	12/90/13%
Days 0.50+	2	2	1	5/90/6%
Days 1"+	1	0	1	1/90/1%
PRECIP. & SNOW DATES				
1.00"+ value/date	1.24"/12th	-	-	
3.5" snow value/date	7.8"/19th	5.9"/28th	-	
3.5" snow value/date	6.6"/21st	4.0"/11th	-	
3.5" snow value/date	7.2"/31st	-	-	

Table 2

RECORDS

ELEMENT	DECEMBER			
	1st		2nd	
High/Date|Prev Rec./Yr.	/	/	/	/
Low/Date|Prev Rec./Yr.	/	/	/	/
Lo Max/Date|Prev Rec./Yr.	/	/	/	/
Hi Min/Date|Prev Rec./Yr.	/	/	/	/
Hi Mean/Date|Prev Rec./Yr.	/	/	/	/
Lo Mean/Date|Prev Rec./Yr.	/	/	/	/
Precipitation/Date|Prev Rec./Yr.	/	/	/	/
Snowfall/Date|Prev Rec./Yr.	7.8"/19th	4.2"/1986	6.6"/21st	5.7"/1887
Top 10 Warmest?				
Top 10 Coolest?				
Top 10 Warm Mean Max?				
Top 10 Cool Mean Max?				
Top 10 Cool Mean Min?				
Top 10 Warm Mean Min?				
Top 10 Wettest?				
Top 10 Driest?				
Top 10 Snowfall?				
100 All-Time Hottest?				
100 All Time Coldest?				
100 All-Time Wettest?				
100 All-Time Driest?				

Table 3a

ELEMENT	JANUARY			
	1st		2nd	
High/Date|Prev Rec./Yr.	/	/	/	/
Low/Date|Prev Rec./Yr.	/	/	/	/
Lo Max/Date|Prev Rec./Yr.	/	/	/	/
Hi Min/Date|Prev Rec./Yr.	/	/	/	/
Hi Mean/Date|Prev Rec./Yr.	/	/	/	/
Lo Mean/Date|Prev Rec./Yr.	/	/	/	/
Precipitation/Date|Prev Rec./Yr.	/	/	/	/
Snowfall/Date|Prev Rec./Yr.	/	/	/	/
Top 10 Warmest?				
Top 10 Coolest?				
Top 10 Warm Mean Max?				
Top 10 Cool Mean Max?				
Top 10 Cool Mean Min?				
Top 10 Warm Mean Min?				
Top 10 Wettest?				
Top 10 Driest?				
Top 10 Snowfall?				
100 All-Time Hottest?				
100 All Time Coldest?	18.3° (#44 (4-way tie))			
100 All-Time Wettest?				
100 All-Time Driest?				

Table 3b

ELEMENT	FEBRUARY			
	1st		2nd	
High/Date|Prev Rec./Yr.	/	/	/	/
Low/Date|Prev Rec./Yr.	/	/	/	/
Lo Max/Date|Prev Rec./Yr.	/	/	/	/
Hi Min/Date|Prev Rec./Yr.	/	/	/	/
Hi Mean/Date|Prev Rec./Yr.	/	/	/	/
Lo Mean/Date|Prev Rec./Yr.	/	/	/	/
Precipitation/Date|Prev Rec./Yr.	/	/	/	/
Snowfall/Date|Prev Rec./Yr.	/	/	/	/
Top 10 Warmest?				
Top 10 Coolest?				
Top 10 Warm Mean Max?				
Top 10 Cool Mean Max?				
Top 10 Cool Mean Min?				
Top 10 Warm Mean Min?				
Top 10 Wettest?				
Top 10 Driest?	0.64" (#6)			
Top 10 Snowfall?				
100 All-Time Hottest?				
100 All Time Coldest?				
100 All-Time Wettest?	0.64" (#31 (4-way tie))			
100 All-Time Driest?				

Table 3c

ELEMENT	SEASON
Top 10 Warmest? Top 10 Coolest? Top 10 Wettest? Top 10 Driest?	

Table 3d

MISCELLANEOUS
DECEMBER

Avg. wind speed/Dep. Fm Norm.	9.8 mph/+1.2 mph
Peak wind/direction/date	54/S/26th
Windiest day avg. value/date	16.4 mph/30th
Calmest day avg. value/date	3.9 mph/18th
# clear days	4
# partly cloudy days	20
# cloudy days	7
Dense fog dates (2)	1st, 19th, 21st, 28th, 31st
Thunder dates (3)	-
Sleet dates (4)	11th, 17th, 24th
Hail dates (5)	-
Freezing rain dates (6)	11th, 12th, 17th, 24th

Table 4a

JANUARY

Avg. wind speed/Dep. Fm Norm.	7.2 mph/-1.8 mph
Peak wind/direction/date	43/WNW/24th
Windiest day avg. value/date	16.4 mph/24th
Calmest day avg. value/date	1.0 mph/2nd
# clear days	11
# partly cloudy days	12
# cloudy days	8
Dense fog dates (2)	7th, 10th, 11th, 28th
Thunder dates (3)	-
Sleet dates (4)	7th, 28th
Hail dates (5)	-
Freezing rain dates (6)	5th, 7th, 28th

Table 4b

FEBRUARY

Avg. wind speed/Dep. Fm Norm.	10.0 mph/+0.8 mph
Peak wind/direction/date	51/WNW/12th
Windiest day avg. value/date	21.0 mph/23rd
Calmest day avg. value/date	2.5 mph/25st
# clear days	9
# partly cloudy days	15
# cloudy days	4
Dense fog dates (2)	12th, 18th, 19th, 22nd
Thunder dates (3)	-
Sleet dates (4)	26th
Hail dates (5)	-
Freezing rain dates (6)	-

Table 4c

WCM Words

Raymond G. O'Keefe
NWS Albany Warning Coordination Meteorologist

A full slate of spring Skywarn training sessions have been posted. There's bound to be a class near you. Check out the listing on our web site at http://cstar.cestm.albany.edu:7775/skywarn/Talks.htm.

Evan Heller offers a comprehensive review of the winter climate. One statistic Evan did not mention is that the last half of the winter has been very short on snow. Since February 1, Albany has measured only 5.2 inches of snow. This is the second least snowfall recorded for this period. First place on the all-time paltry list goes to February 1-March 31, 1987 checking in at 4.2 inches.

For some good reading, check out the rest of *StormBuster*.

From the Editor's Desk

Spring is finally here! Warm temperatures, rapidly-increasing day length, and an extra hour thrown in at the end of the day thanks to Daylight Savings Time. We've also had more than our share of sunshine in recent weeks. The warming trend is already quite noticeable, although we are still having our share of lingering cold. Unless you are a skier or snowshoer, you are probably happy to see that winter has finally come to an end. It wasn't that it was, overall, that harsh of a winter, but we were racked with the problems associated with winter weather rather early in the season this year. We had one of our biggest-ever ice storms before Christmas. Our lead-in article details this memorable weather event. Then, besides my seasonal climate recap, we have three other offerings. If you are an online weather buff, these articles will be of great interest to you.

If you're like me, you look forward to spring, because it means soon you'll be golfing, walking, and spending many a pleasurable day outdoors with friends and family. Or how about a breath-taking view of a field of colorful spring flowers? Every spring, people on the west coast are routinely treated to vast fields of California Poppy (Eschscholzia Californica), an early-season bloomer. While not native to our area, they are easy to cultivate in a garden or container, come in several varieties, and are worth it for their breath-taking golden-orange color. Enjoy the richness of the season!

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Session information available at:

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California Poppy Reserve

California Poppy field

California Poppy field