# NORTHEASTERN STORM BUSTER

**Emergency Manager & Storm Spotter Magazine**

***Fall, 2007**-VOL. 12, NO. 4*
***Evan L. Heller, Editor***
***Raymond O'Keefe, Publisher***
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## DEPARTMENTS





## *MEMORABLE SUMMER WEEKENDS OF 2007*


*Kevin S. Lipton*
*Meteorologist, NWS Albany*

*Brian G. Montgomery*
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The summer of 2007 may be best-remembered for the string of fabulous weekends which occurred across eastern New York State and western New England, especially in contrast to the wet summer of 2006. Because our region has tourism and outdoor recreational activities, nice weekends without much rainfall are key to the success of the local economy, as well as to the enjoyment of the hundreds of thousands of people who seek refuge from the nearby bustling metropolitan areas.

So, how nice were the summer weekends of 2007? In order to determine this, several statistics were calculated for the weekends of the summer, which actually begin with the Memorial Day weekend in late May, and conclude with the Labor Day weekend in early September. First, the average high and low temperatures were computed for all the weekends during this time period at three different climate stations: Albany International Airport; Poughkeepsie, and; Glens Falls. Second, and perhaps most important, the number of 'dry' versus 'wet' weekend days was determined. A 'wet' day was considered to be one in which measurable precipitation (0.01 inch or more) was observed at any of the three stations. Finally, the percentage of possible sunshine at Albany was calculated for all the weekend days. Each of these computations were then averaged to paint a picture of the summer weekend days of 2007. The numbers that were found were: an average high temperature of 80.8º, an average low temperature of 56.1º, 68.3% of weekends being dry, and the overall percentage of possible sunshine being at 68.0%. The key conclusions that can be drawn from these statistics are that the summer of 2007 had more dry weekend days than wet ones (more than 2/3), and that more than half of the days had abundant sunshine. While more than 30% of the weekends were determined to be wet by our definition, it should be noted that most of the rainfall was scattered in areal coverage, and generally did not last very long. In addition, much of the rain fell during the nighttime hours, which limited the impact on summer recreational activities, the brunt of which are daytime-oriented. Furthermore, there was generally a wide range of temperatures each weekend, with some weekends having high temperatures in the 90s, and lows in the 60s. Other weekends had a more autumnal feel, with highs in only the low and mid 70s, and overnight lows down into the 40s and 50s.

For comparison, we calculated the same statistics for the summer of 2006, and determined that the average high temperature for the weekends was only 77.0º, the average low, 57.3º, and that only 51% of the weekends were 'dry'. Furthermore, there was only 42.4% of the possible sunshine received at Albany, which was more than 25% less than this past summer. Thus, summer weekends last year were indeed wetter and cloudier, and also had slightly cooler daytime highs, due mainly to the increased cloud cover.

Several regional tourism centers reported stronger business this summer than last, attributable mainly to this past summer's nicer weather. According to the September 5th edition of the Schenectady Daily Gazette, many Lake George destinations reported improved summer business in 2007, as did many regional hotels and state-owned campgrounds, over 2006. So – it wasn't just in your mind; this summer truly contained quite a few pleasant weekends, especially when compared to last year. At least from the business aspect, let's hope that the upcoming fall and winter treat us just as kindly. The latest climate outlooks for autumn and winter are available from the Climate Prediction Center, and the new 3-Month Local Climate Outlook products are available from this web page: http://www.weather.gov/climate/l3mto.php.

**COCoRaHS IS HERE!**

**See Page 10 for full details.**

## *SUMMER 2007: RAINY IN THE MIDDLE… CLOSE TO NORMAL AT THE ENDS*

*Evan L. Heller*
*Climatologist, NWS Albany*

Summer 2007 in Albany wasn't too off the mark. There was a little more rain than is typical, and temperatures were within 3 degrees of normal for any given month.

June was a temperature see-saw in Albany, with average daily temperatures starting well above normal, then dropping well below within just the first week. For the balance of the month, the cycle repeated three more times, with the month ending a little on the cool side. There were no daily, monthly or seasonal records during the month. In fact, the only temperature record for the summer didn't occur until August. There were, however, three days in June with high temperatures topping out at 90 degrees or better. These were on the 8th, 26th and 27th. The warmest readings occurred on the latter two dates, with a high of 94º both days. The 27th was the warmest day of the month, also tying with August 3rd as the warmest day of the season. The mean temperature for the day was 82.0º. The month's high minimum reading of 70º that same day helped in this effort. In contrast, the coolest day of the month was the 6th, with a mean of just 53.0 º. This was also the coolest day of the season. With the low maximum temperature for the month of just 61º occurring on the 6th, it was the 7th that had an easy time dropping off to the month's coolest reading of 40º. The average high for June was 79.7º, 2.2º above normal, and the average low was 57.8º, 2.8º above normal. This resulted in a mean of 68.8º, which was 2.5º above normal.

Precipitation for June totaled 3.36", 0.38" below normal. At least a trace of precipitation was recorded on 16 days of the month, with measurable amounts on 12 of these days. A tenth to 0.25" occurred on 2 of those days, and between 0.50" and 0.99"on 3 others. The wettest day of the month set the month's only daily precipitation record at Albany, when 1.30" fell on the 4th. This broke the date's scant 0.79" record, from 1882.

The distribution of clear, partly cloudy and cloudy days was nearly identical for each month of summer, with all three months producing a good deal of sunshine. For June, the numbers of clear, partly cloudy and cloudy days were 20, 9 and 1, respectively. Dense fog was recorded on the 3rd, 5th, 11th and 13th; and thunderstorms, on the 2nd, 5th, 12th, 19th, 21st and 27th. Albany's average wind speed for June was 6.7 mph, with the peak wind being 37 mph, from the west on the 5th, and the northwest on the 22nd. With an average speed of 14.8 mph, the 22nd was the windiest day of the month, and with an average of just 2.1 mph, the 7th was the calmest.

July 2007 was, by far, the wettest of the three summer months. The 7.03" total was more than double the 3.50" normal. It is Albany's 8th wettest July on record, and also the 25th wettest month of all time. The month's two new daily record values contributed to this total. 2.07" fell on the 9th, breaking the previous record for the date of 1.62" set back in 1938. And 1.86" on the 18th broke the 1.63" record from 1965. There were 16 days in July with a trace or more of rainfall, and on all 16 was it measurable, with 10 days receiving 0.10" or more. Of these 10 days, 0.25" or more fell on 8, and of those 8, 0.50" or more fell on 4. The two days that received an inch or more were the two record dates.

July was the only below normal month for temperatures in Albany, albeit slightly. The 70.5º mean was just 0.6º below normal. The average high of 80.6º was 1.6º below normal, while the 60.5º average low was 0.5º above. There were some temperature swings during the month, but they were not as extreme as for June. The warmest day of the month was the 10th, with an 80.5º mean. Both the maximum temperature for the month, 93º, and the high minimum, 68º, also occurred on this day. The mercury reached 90º again on the 9th. The 1st, with a mean temperature of 61.5º, was the coolest day of the month, but the coldest reading, 50º, occurred on both the 2nd and 3rd. And the 23rd recorded the lowest high reading of the month, 69º.

There were 21 clear, 10 partly cloudy and no cloudy days in July. Dense fog occurred on the 18th, 19th and 25th; and thunder was heard at Albany on the 6th, 9th, 11th, 27th and 28th. The average wind speed for July was 5.7 mph, with the peak wind being 49 mph, from the west on the 9th. With an average speed of 11.8 mph, the 11th was the windiest day, while the 28th was the least windy, with an average speed of only 1.4 mph.

August 2007 was the driest of the three months in Albany, and there were no precipitation records of any kind. The 2.34" total was 1.34" below normal. There was precipitation on 14 days of the month, on 8 of which it was measurable. Of these 8 days, 0.10" or more occurred on 4 of them, with 0.25" or more on 3 of these, and 0.50" or more on 2 of those. The wettest day was the 10th, with a total of 0.94".

Temperatures for August were only 1.7º above normal, with a mean of 70.7º The average high of 81.1º was 1.4º above normal, and the average low of 60.4º was 2.1º above normal. The only record of any kind established at Albany during the month was a daily low maximum. This occurred on the 20th when the mercury climbed to just 66º, breaking the 68º record from 1977. This low maximum was the lowest of the month. It was repeated on the 22nd, but this time it was not a record. The 20th was also the coolest day, with a mean temperature of 58.5º. However, the low reading for the month was recorded not on the 20th, but the 19th, when the mercury dipped to 48º. The warmest reading for August was 93º, and this occurred on the 25th. The other dates to reach or exceed 90 degrees were the 2nd, 3rd and 30th. The month's high minimum reading of 72º occurred on both the 3rd and 8th, and the 3rd wound up being tied for the warmest day of the summer, with a mean temperature of 82.0º.

There were 21 clear, 9 partly cloudy and one cloudy day(s) in August. Dense fog occurred on both the 11th and 21st, and thunderstorms occurred on the 3rd, 17h, 25th and 30th. The average wind speed for the month was 6.0 mph, with the peak wind being 53 mph, from the northwest on the 17th. The windiest day was the 20th, with an average speed of 12.7 mph, the calmest day, the 7th, with an average speed of just 1.1 mph.

Wrapping up the season, Albany's mean high for the 3-month period was 80.5º, 0.7º above normal, and the mean low was 59.6º, 1.8º above normal. This resulted in a mean for the season of 70.0º, 1.2º above normal. Precipitation totaled 12.73", 1.81" above normal, and this was almost identical to the Spring 2007 amount.

## *NEW CLIMATE PRODUCTS*

*Ingrid Amberger*
*Climate Services Program Leader, NWS Albany*

National Weather Service (NWS) Forecast Offices routinely issue Daily Climate Reports (CLI) and Monthly Climate Summaries (CLM) for their primary Local Climatological Data (LCD) sites. The NWS Forecast Office at Albany, New York has one primary LCD site: Albany, New York (Figure 1). In the spring of 2007, the NWS approved two new climate products: Seasonal Climate Summary (CLS) and Annual Climate Summary (CLA). The format of the new products is very similar to the Daily Climate Report (CLI) and Monthly Climate Summary (CLM).

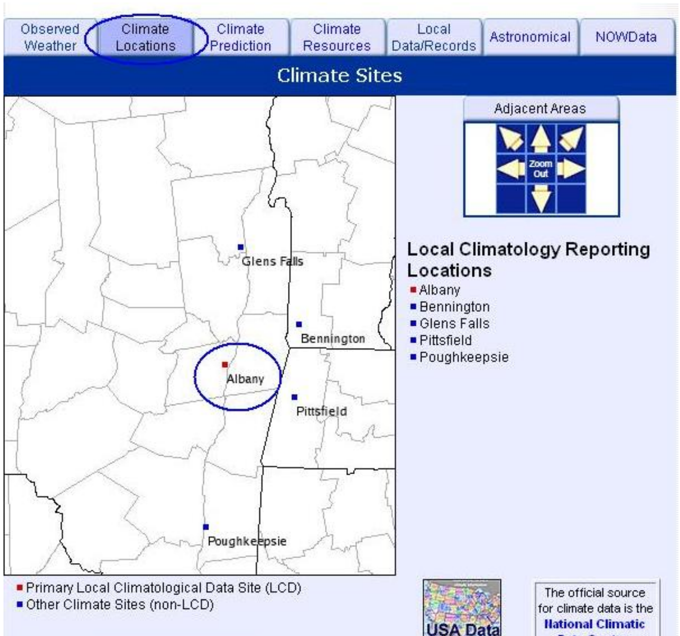


Figure 1

The CLS will be issued at the end of each meteorological season. Winter: December, January and February; Spring: March, April and May; Summer: June, July and August, and; Autumn: September, October and November. The very first Seasonal Climate Summary for Albany, New York was issued for the summer of 2007 (Figure 2).

SKYWARN Winter Weather Workshops are now available.

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Listings begin on Page 9.

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CLIMATE REPORT
NATIONAL WEATHER SERVICE ALBANY NY
340 AM EDT MON SEP 5 2007

...THE ALBANY CLIMATE SUMMARY FOR THE SEASON, FROM
6/1/2007 TO 8/31/2007...

CLIMATE NORMAL PERIOD 1971 TO 2000
CLIMATE RECORD PERIOD 1874 TO 2007

WEATHER          OBSERVED          NORMAL  DEPART
                  VALUE   DATE(S)  VALUE   FROM
                                           NORMAL
................................................
TEMPERATURE (F)
RECORD
 HIGH              104   07/04/1911
 LOW                27   06/01/1938
HIGHEST             94   06/27
                         06/26
LOWEST              40   06/07
AVG. MAXIMUM      80.5               79.0    1.5
AVG. MINIMUM      59.6               57.8    1.8
MEAN              70.0               68.8    1.2
DAYS MAX >= 90       9                9.8   -0.8
DAYS MAX <= 32       0                0.0    0.0
DAYS MIN <= 32       0                0.0    0.0
DAYS MIN <= 0        0                0.0    0.0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM         16.74   1975
 MINIMUM          4.29   1929
TOTALS           12.73              10.92    1.81
DAILY AVG.        0.14               0.12    0.02
DAYS >= .01         36               32.8     3.2
DAYS >= .10         19               20.8    -1.8
DAYS >= .50          9                7.2     1.8
DAYS >= 1.00         3                2.3     0.7

DEGREE_DAYS
HEATING TOTAL       70                 98     -28
 SINCE 7/1          32                 36      -4
COOLING TOTAL      558                465      93
 SINCE 1/1         617                496     121
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Figure 2

The CLA is a summary of the year, including departures from normal and data from the previous year. It must be noted that the snowfall given in the annual summary is for the calendar year, and is not the seasonal snowfall of October to May. A CLA for Albany, New York was issued for 2006 (Figure 3).

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CLIMATE REPORT
NATIONAL WEATHER SERVICE ALBANY NY
200 AM EDT WED SEP 5 2007

...THE ALBANY CLIMATE SUMMARY FOR THE YEAR OF 2006...

CLIMATE NORMAL PERIOD 1971 TO 2000
CLIMATE RECORD PERIOD 1874 TO 2007

WEATHER          OBSERVED          NORMAL  DEPART   LAST YEAR'S
                  VALUE   DATE(S)  VALUE   FROM     VALUE  DATE(S)
                                           NORMAL
.................................................................
TEMPERATURE (F)
RECORD
 HIGH              104    07/04/1911
 LOW               -28    01/19/1971
HIGHEST             96    08/01                          94  06/26
LOWEST               2    01/16                         -16  01/28
                                                             01/24

AVG. MAXIMUM      59.8              57.6      2.2      58.7
AVG. MINIMUM      41.2              37.5      3.7      39.7
MEAN              50.5              47.5      3.0      49.2
DAYS MAX >= 90      10               8.4      1.6        15
DAYS MAX <= 32      22              45.0    -23.0        49
DAYS MIN <= 32     125             145.0    -20.0       140
DAYS MIN <= 0        0              11.5    -11.5        11

PRECIPITATION (INCHES)
RECORD
 MAXIMUM         49.37    1878
 MINIMUM         21.55    1964
TOTALS           46.49             38.60     7.89     47.72
DAYS >= .01        135             137.0     -2.0       136
DAYS >= .10         77              78.6     -1.6        89
DAYS >= .50         31              25.8      5.2        33
DAYS >= 1.00        12               7.0      5.0        13

SNOWFALL (INCHES)
TOTALS            19.8              62.7    -42.9      75.4
DAYS >= TRACE       58              35.7     22.3        71
DAYS >= 1.0          6              15.3     -9.3        18

DEGREE_DAYS
HEATING TOTAL     5844              6860    -1016      6577
 SINCE 7/1        2161              2602     -441      2312
COOLING TOTAL      675               544      131       929
 SINCE 1/1         675               544      131       929
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Figure 3

Figure 4

These new summaries have been added to our suite of climate products to standardize how NWS Forecast Offices distribute climate information. They are available from our main climate web page under the "Local Data/Records" tab (Figure 4).

As you use the new climate summaries, remember, there is a wealth of climate data available on-line for Albany, New York from our main climate web page under the "Local Data/Records" tab (Figures 5 & 6).

# Albany NY Normals & Extremes

Figure 5

**All data on this page is unofficial**
(National Climatic Data Center - official data source)

## Daily / Monthly Normals & Extremes

| WINTER | SPRING | SUMMMER | AUTUMN |
|---|---|---|---|
| DECEMBER | MARCH | JUNE | SEPTEMBER |
| JANUARY | APRIL | JULY | OCTOBER |
| FEBRUARY | MAY | AUGUST | NOVEMBER |

## Monthly Normals 1971-2000

| Month | MaxT | MinT | MeanT | HDD | CDD | Pcpn | Snow |
|---|---|---|---|---|---|---|---|
| Jan | 31.1 | 13.3 | 22.2 | 1330 | 0 | 2.71 | 17.7 |
| Feb | 34.3 | 15.7 | 25.0 | 1135 | 0 | 2.27 | 12.8 |
| Mar | 44.5 | 25.4 | 35.0 | 938 | 1 | 3.17 | 10.9 |
| Apr | 57.3 | 35.9 | 46.6 | 553 | 3 | 3.25 | 2.9 |
| May | 69.8 | 46.5 | 58.1 | 240 | 27 | 3.67 | 0.1 |
| Jun | 77.5 | 55.0 | 66.3 | 62 | 102 | 3.74 | 0 |
| Jul | 82.2 | 60.0 | 71.1 | 10 | 206 | 3.50 | 0 |
| Aug | 79.7 | 58.3 | 69.0 | 26 | 157 | 3.68 | 0 |
| Sep | 71.3 | 49.9 | 60.6 | 168 | 46 | 3.31 | 0 |
| Oct | 59.7 | 38.8 | 49.3 | 484 | 2 | 3.23 | 0.2 |
| Nov | 47.5 | 30.8 | 39.2 | 772 | 0 | 3.31 | 5.1 |
| Dec | 36.0 | 20.1 | 28.0 | 1142 | 0 | 2.76 | 13.0 |
| Ann | 57.6 | 37.5 | 47.5 | 6860 | 544 | 38.60 | 62.7 |

| Average Precipitation Map | Average Snowfall Map |
|---|---|

## Seasonal Normals 1971-2000 (in table) & Extremes (click on individual season)

| Season | MaxT | MinT | MeanT | HDD | CDD | Pcpn | Snow |
|---|---|---|---|---|---|---|---|
| Winter | 33.8 | 16.4 | 25.1 | 3607 | 0 | 7.74 | 43.5 |
| Spring | 57.2 | 35.9 | 46.4 | 1731 | 31 | 10.09 | 13.9 |
| Summer | 79.8 | 57.8 | 68.8 | 98 | 465 | 10.92 | 0 |
| Autumn | 59.5 | 39.8 | 49.7 | 1424 | 48 | 9.85 | 5.3 |
| Annual | 57.6 | 37.5 | 47.5 | 6860 | 544 | 38.60 | 62.7 |

HDD = Heating Degree Days   CDD = Cooling Degree Days

## Special Climate Data
## Albany NY

Figure 6

**All data on this page is unofficial**
(National Climatic Data Center - official data source)

Annual Temperatures & Precipitation

Go to "Normals and Extremes" for monthly and seasonal data on the Warmest, Coldest, Wettest, Driest, Snowiest and Least Snowiest

Holiday Data for Albany NY

| Temperatures | |
|---|---|
| Top 10 Coolest Years | Top 10 Warmest Years |
| Top 10 Coldest Months | Top 10 Hottest Months |
| All times -20 degrees or below | All times 100+ degrees |
| --- | 90+ degree days |
| Cold Spells | Heat Waves |

| Precipitation | |
|---|---|
| Top 10 Wettest Years | Top 10 Driest Years |
| Top 10 Wettest Months | Top 10 Driest Months |
| --- | Dry Spells |

| Growing Seasons | |
|---|---|
| Growing Seasons | Start of the Season |

| Snowfall & Snowstorms | |
|---|---|
| Seasonal Snowfall Totals | Top 20 Snowstorms |
| Top 20 Seasonal Snowfall | Top 10 Snowstorms by Month |
| Top 20 Least Snowiest Seasons | Daily Snowfall Records |
| Snowfall Season beginning/ending dates | |

As always, your feedback is important us. If you have any questions or comments regarding our climate page and/or products, please direct them to the NWS Albany webmaster at: Alywebmaster@noaa.gov

## *NWS ALBANY PARTICIPATES IN ANNUAL ADIRONDACK BALLOON FESTIVAL*

*John S. Quinlan*
*Meteorologist, NWS Albany*

*Evan L. Heller*
*Meteorologist, NWS Albany*

For the 3rd consecutive year, NWS Albany operated a booth at the Adirondack Balloon Festival, held at Floyd D. Bennett-Warren County Airport. The weather for this 35th annual event was, for the most part, much better than last year when low clouds, rain and drizzle precluded the morning launch. This year, the balloons had a successful Saturday morning launch but were unable to lift off during the early evening due to a brief shower, and winds that gusted at times to over 20 mph. With winds calm at the surface, the morning launch (see picture) saw 90+ balloons lift off and move swiftly off toward the northeast as winds picked up just above ground level. Winds a few thousand feet above the ground had been forecast to be greater than 30 mph for the morning run. The liftoff, originally scheduled for 6:30 a.m., was delayed by fog until 7:36 a.m., when the airport fire horn finally sounded, giving the go-ahead to the pilots that the visibility had improved enough to fly. Spectators who intended to arrive after 6 a.m. found themselves delayed in traffic for up to two hours. Airport officials estimated that about 20,000 spectators showed up to watch the Saturday morning lift-off. As the winds increased throughout the late morning, numerous kite flyers took advantage of the ideal conditions, which persisted until sundown.

The booth was staffed by NWS Albany meteorologists John Quinlan and Evan Heller, as well as 5 SUNY-Albany volunteer students who are members of the Capital Region Chapter of the American Meteorological Society. A total of 440 people stopped by the booth to ask weather-related questions and pick up pamphlets dealing with winter weather, flooding, hurricanes, thunderstorms, tornadoes and lightning. A NOAA All-Hazards Weather Radio and Clear-Vu Rain Gage were on display. Also on display were a tethered weather balloon, radiosonde and parachute that our office routinely sends up to measure the upper atmosphere. A few people inquired about becoming weather spotters, and were given information on CoCoRaHS (see article). Our thanks go out to all those individuals who stopped by our booth, and we look forward to attending the 36th Annual Adirondack Balloon Festival next year.

## *LOCAL WINDS PART II: UPSLOPING WINDS AND THE SEA BREEZE*

*Thomas A. Wasula*
*Meteorologist, NWS Albany*

Winds are caused by temperature differences that occur due to the uneven heating of the earth's surface. The temperature differences cause air density variations which result in a locally-produced pressure gradient that produces small-scale local winds. Many kinds of local winds are caused by certain topographical features or other physical variations of the local surface. Three common downsloping local winds that impact valley locations in different parts of the world such as the Chinook/Foehn, Santa Ana, and katabatic/fall winds were reviewed in *Local Winds Part I*, in the Summer 2007 edition of Northeastern StormBuster. This article will focus on upsloping winds such as the valley breeze. The sea, or lake breeze circulation will also be discussed.

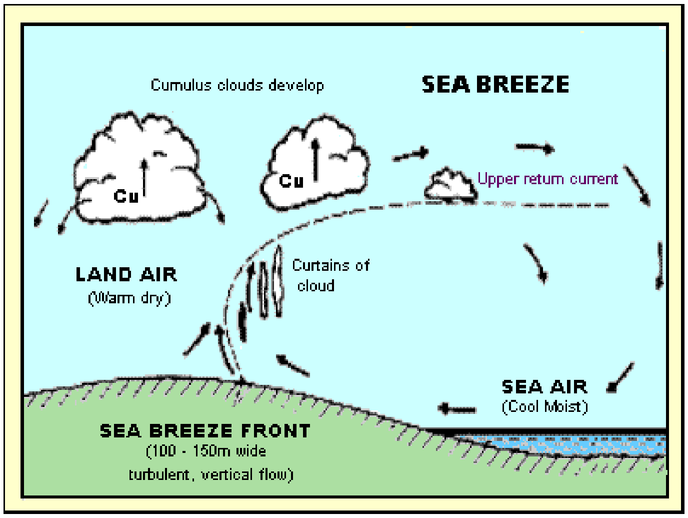
Upslope flow is the phenomena that can produce enhanced precipitation near mountains. For example, upslope can produce mountain warm-season thunderstorms and heavy snowfall. Upslope winds occur on the windward side of mountains. Most of the time, the west sides of the Sierra Nevada and Cascade Mountain ranges are the windward, or upslope, side. In the Rocky Mountains, however, alternation between the west and east sides being the windward side is typical. Easterly winds promote the upslope flow for the high Plains near the Rocky Mountains when there is a developing area of low pressure over the central Plains. Upslope flow causes air to rise, expand and cool. Relative humidity values increase as a result of the rising motion. The air and dew point temperatures converge, as the air temperature typically decreases with increasing height faster than the dew point temperature does, with the rising air parcels eventually reaching the condensation level. Storm systems associated with upslope flow on the eastern slopes of the Rockies can produce significant amounts of precipitation. In spring and autumn, major snowstorms can result.

A valley breeze is the most common type of upslope wind. On a typical day, air along a mountain slope warms significantly faster than air at a similar elevation along the valley floor. The warmer air moves up along the mountain slope, and the air along the valley floor moves in to replace it, resulting in a valley breeze. Isolated to scattered cumulus clouds forming along the mountain chains and on mountain peaks indicate the occurrence of diurnal, or daytime-heating-induced, upslope valley breezes. If the valley breezes are strong enough, the cumulus clouds could develop into late afternoon thunderstorms. When the diurnal heating diminishes late in the day, the pattern reverses. Rapid heat loss along the mountain slopes cools the air. The cool air drains into the valley (like a katabatic wind), producing a mountain breeze. Valley breezes are most common during the warm season, such as summer, when average solar heating is at its peak, while mountain breezes predominate during the cool season when nighttime heat losses are accelerated.

The sea breeze circulation is caused by the temperature contrast between the earth and the sea coupled with the pressure difference between the two bodies. Land heats up much faster than water during the late morning and early afternoon. The air over the land rises and expands, forming low pressure. Conversely, high pressure associated with sinking air forms over the water, and a sea breeze circulation develops as the cooler air over the water moves inland from high pressure to low pressure (see figure). In the evening, the reverse process takes place, with the land cooling much more rapidly than the sea or lake. Eventually, the air over the land becomes a higher pressure than the air over the water, and a land breeze forms. The sea breeze has a significant impact on temperatures at coastal locations. A sea breeze can cause air temperatures to fall as much as 5-10°C (~10-20°F). The cooling effect of sea breezes migrates only about as much as 50 miles inland in the tropics, yet only about half that distance in the mid-latitudes as the water is cooler, and there is less of it. The strength and inward extent of sea breezes depends on both the geographical location and time of year. Tropical locations have more pronounced sea breezes due to the stronger year-round solar heating. The mid-latitude locations have the strongest sea breezes during the warm season months, but the land breeze can be missing since the land temperatures there don't often cool to below the surrounding ocean water temperatures. The sea breezes usually commence shortly after noontime. The greatest wind intensity with the breezes is 10 to 15 mph, unless thunderstorms form. The greatest impact of sea breezes in the United States is on the mid-Atlantic coast and Florida. Cities like Chicago, Cleveland and Buffalo are impacted by smaller-scale sea breezes forming along the Great Lakes shores. The cooler lake temperatures can cool down these cities in the spring and summer. Florida is frequently impacted by the heavy rainfall from thunderstorms associated with sea breezes. The peninsula of Florida receives copious amounts of rainfall during the summer from the convergence of sea breezes from the Gulf of Mexico and Atlantic Ocean.

Local winds are a part of the global circulation. Upslope winds and sea breezes are two types of local winds that impact portions of North America. Several other local winds, mostly of the downslope variety, that impact other continents (i.e., Haboobs, Siroccos, Zondas, etc.) will be discussed in the next issue of Northeastern StormBuster.

Source:
**http://www.bom.gov.au/weather/nsw/amfs/Sea%20Breeze.shtml**




**Sea breeze circulation**

## *TROPICAL UPDATE-2007*

*Brian Montgomery*
*Senior Meteorologist, NWS Albany*

This year's tropical season has seen activity come in rather inconsistent waves. We began with a NOAA forecast of an 85 percent chance for an above-normal active season, with up to 17 named storms, of which up to 9 could be hurricanes, 5 of those being major. The following link displays a chart that shows the climatology of the tropical activity: (http://www.noaanews.noaa.gov/stories2007/images/2007hurricaneupdate3b.jpg). September wound up being a peak month for activity. Here's a review of the tropical cyclones in the Atlantic basin through September 2007.

Andrea originated from a strong extratropical low pressure system that had formed off the coast of the Carolinas on May 6, gradually acquiring some tropical characteristics. Andrea became a subtropical storm off the Jacksonville, Florida coast on May 9. This system had a peak wind of 50 mph, but quickly dissipated by May 11.

Tropical Storm Barry developed off the Yucatan Peninsula on June 1, achieving a peak wind intensity of 60 mph about 150 miles west-southwest of the Dry Tortugas. Barry weakened to a Tropical Depression when it made landfall in the Tampa Bay area on June 2.

Tropical Storm Chantal developed roughly 240 miles north-northwest of Bermuda on July 31. It remained over the Atlantic Ocean, and achieved a peak wind intensity of 50 mph later that same day. Chantal was short-lived though, quickly weakening August 1 on its approach to southeastern Newfoundland.

As we approached the climatological peak of the hurricane season, three tropical cyclones developed during the month of August. Dean became the first major hurricane of the season on August 21, making landfall as a Category 5 storm on the east coast of the Yucatan Peninsula near Maya, Mexico on August 22. Dean reached peak intensity just before landfall, with 165 mph winds, and a minimum central pressure of 906 millibars (26.75 inches of mercury). As Dean crossed the peninsula, it re-emerged over the Bay of Campeche, and strengthened to 100 mph. It made a second landfall about 40 miles south of Tuxpan, Mexico on August 22.

Erin became a tropical storm on August 15 in the Gulf of Mexico. However, it failed to strengthen to more than 40 mph as it approached the Texas coast. Erin made landfall near Lamar, Texas on August 16, and quickly weakened. However, this system survived remarkably well over Texas, and into Oklahoma and southern Missouri, with extremely heavy rainfall resulting in flash flooding. Some locations received more than 10 inches of rain, with average rainfall amounts from 3 to 7 inches.

Felix formed on the last day of August, lingering into the first week of September. Felix took a similar path to Dean, albeit a bit further south, also reaching a peak intensity of 165 mph. This marks the second Category 5 storm of the season, making landfall along the northern Nicaragua coast on September 4.

Tropical Storm Gabrielle developed on September 8 off the U.S. southeast coast. Gabrielle tracked northwest toward the outer banks of North Carolina, and made landfall on September 9-10 with peak winds of 45 mph. Gabrielle quickly made a right turn out over the open Atlantic, dissipating on September 11.

Tropical Storm Ingrid developed out in the tropical Atlantic Ocean on September 13. This system peaked with winds of 45 mph on September 14 as it tracked west-northwest. It did not threaten land, and dissipated on September 17 just to the north of the Leeward Islands.

Humberto developed rather close to the northeast Texas coastline on September 12. With its very slow movement over the very warm waters of the Gulf of Mexico, Humberto strengthened to a Category 1 hurricane, with sustained winds of 75 mph on September 13. Landfall occurred along the extreme northeast coast of Texas near High Island during the early morning hours of September 13. This brought some much needed rainfall to a drought-stricken region of the southeastern United States. Based on operational estimates of Humberto, this system strengthened to a hurricane in roughly 18 hours. No tropical cyclone in the historical record has ever reached this intensity at a faster rate near landfall.

For further updates, visit the National Hurricane Center at http://www.nhc.noaa.gov.

## *FALL 2007 SKYWARN WINTER WEATHER WORKSHOPS*

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

***Date*** ***Day*** ***Time*** ***County***
***City or Town***
***Location***

10/16/07 TUE 7:00-9:00 P.M. SCHOHARIE
SCHOHARIE, NY
PUBLIC SAFETY FACILITY, 2ND FLOOR EMO TRAINING ROOM
1 DEPOT LANE

10/18/07 THU 6:30-8:30 P.M. HAMILTON
INDIAN LAKE, NY
TOWN HALL, ASSEMBLY ROOM
PELON RD.

10/23/07 TUE 6:00-8:00 P.M. SARATOGA
CLIFTON PARK, NY
CLIFTON PARK-HALFMOON PUBLIC LIBRARY, ROOM A
475 MOE RD.

10/24/07 WED 7:00-9:00 P.M. WASHINGTON
FORT EDWARD, NY
PUBLIC HEALTH TRAINING FACILITY, YELLOW BUILDING BEHIND COUNTY ANNEX
OFF BROADWAY

10/27/07 SAT 10:00 A.M.-NOON DUTCHESS
EAST FISHKILL, NY
EAST FISHKILL FIRE DISTRICT TRAINING BUILDING
2502 SR 52

10/29/07 MON 6:30-8:30 P.M. LITCHFIELD
TORRINGTON, CT
TORRINGTON CITY HALL 2ND FLOOR AUDITORIUM
140 MAIN ST.

10/30/07 TUE 7:00-9:00 P.M. ALBANY
ALBANY, NY
C.E.S.T.M., 1ST FLOOR AUDITORIUM
251 FULLER RD.

11/13/07 TUE 7:00-9:00 P.M. ULSTER
KINGSTON, NY
HOSE #5 FIRE HOUSE
830 ULSTER AVE.

11/14/07 WED 6:30-8:30 P.M. HERKIMER
HERKIMER, NY
HERKIMER COUNTY COMM. COLLEGE, 911 CENTER
71 RESERVOIR RD.

11/19/07 MON 7:00-9:00 P.M. COLUMBIA
HUDSON, NY
NOECKER BUICK PONTIAC
92 UNION TURNPIKE/RTE. 66

11/28/07 WED 7:00-9:00 P.M. BENNINGTON
BENNINGTON, VT
BENNINGTON FREE LIBRARY
101 SILVER ST.

The SKYWARN Winter Weather Workshops are open to current SKYWARN Spotters, as well as members of the general public age 12 and older who are interested in CoCoRaHS (See article that follows). These workshops focus on all aspects of winter weather (snow, sleet and freezing rain), as well as winter season flood events such as ice jams and non-convective high wind events.

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 and severe weather, such as 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 2-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 on our NOAA Weather Radio stations, and posted on our web site. 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 your own 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, click on 'eastern New York', and look for the link to SKYWARN Spotter Training. If you need to register by phone, call 518-435-9580. You will 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. Note: You must use a touch-tone phone to pre-register, and once you have done so, you will not receive a call back unless the session has been cancelled, changed, or is full.

## *WHAT IS CoCoRaHS??*

CoCoRaHS is an acronym for the Community Collaborative Rain, Hail and Snow Network. CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web-site, our aim is to provide the highest quality data for natural resource, education and research applications. We currently operate in many states across the country. If we are not in your state please drop us a line and let us know that you have an interest in participating. This helps us know where a desire exists for the network and where to focus our future expansion efforts.

### Who can participate??

This is a community project. Everyone can help, young, old, and in-between. The only requirements are an enthusiasm for watching and reporting weather conditions and a desire to learn more about how weather can effect and impact our lives.

### What will our volunteer observers be doing??

Each time a rain, hail or snow storm crosses your area, volunteers take measurements of precipitation from as many locations as possible (see equipment). These precipitation reports are then recorded on our Web site www.cocorahs.org. The data are then displayed and organized for many of our end users to analyze and apply to daily situations ranging from water resource analysis and severe storm warnings to neighbors comparing how much rain fell in their backyards.

### What benefits are there in volunteering??

One of the neat things about participating in this network is coming away with the feeling that you have made an important contribution that helps others. By providing your daily observation, you help to fill in a piece of the weather puzzle that affects many across your area in one way or another. You also will have the chance to make some new friends as you do something important and learn some new things along the way. In some areas, activities are organized for network participants including training sessions, field trips, special speakers, picnics, pot-luck dinners, and photography contests just to name a few.

### How can I sign up??

CoCoRaHS is currently up and running in New York State, but is not yet available in New England. If you live in New York State and would like to participate in CoCoRaHS, visit the following link to sign up:
http://www.cocorahs.org/state.aspx?state=ny

## WCM Words

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

Here's what's on tap in this issue.

Our fundamental mission is the protection of life and property. Much of our outreach efforts are focused toward that goal. That's why I ask you to consider attending one of our Fall Skywarn sessions. After a slow start last year, winter really heated up (cooled down?) with the Martin Luther King Day ice storm and continued into April with powerful snowstorms. Real-time measurements of snow, ice, rain, and flooding were critical to our warning operations. You can provide that information. Spotter training will get you ready. There are 11 Skywarn sessions across our region. One is close to you.

The CoCoRaHS story highlights another way to provide weather data to the National Weather Service. Get in on the ground floor with this new program just getting started in New York State.

The Adirondack Balloon Festival article highlights our outreach commitment to public education and preparedness.

Climate takes center stage in this edition with articles on new climate products – monitoring and forecasts – issued by the National Weather Service, a look back at the summer weather, including an in-depth study of weekend weather, and a review of the hurricane season.

Finally, a meteorological primer on local wind regimes focusing on downslope winds and sea breeze circulations.

## *From the Editor's Desk*

The recent severe weather we've had to deal with caused some delay in getting this issue out to you, but it's finally here. It was a pretty nice summer season across upstate New York and western New England. Most of the articles we offer this time around highlight the weather and climate events that shaped the season…both locally and from a broader perspective. Apple-picking season is underway, reminding us that colder weather is just around the corner. We hope your summer was enjoyable, and that you may take advantage of all that the fall season has to offer, locally. We look forward to coming to you again when winter rolls in. Until then, enjoy the articles…and the cooler weather!