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Evan L. Heller, Editor
Raymond O'Keefe, Publisher
Ingrid Amberger, Webmaster

IN THIS ISSUE

FEATURES

DEPARTMENTS

LIGHTNING SAFETY AWARENESS WEEK: JUNE 18-24, 2006

Gene Auciello
Meteorologist In Charge, NWS Albany

Summer is the peak season for lightning, one of the deadliest of weather phenomena. No place is lightning-proof, but some places are safer than others.

The safest location during lightning activity is a large enclosed building, never a picnic shelter, shed, or partially open structure. The second-safest location is a secure automobile, not a convertible or soft-topped vehicle. Seek safe shelter when you first hear thunder, or see dark, threatening clouds or lightning. When you see a lightning flash, count the number of seconds until you hear thunder, then divide by five to get the distance of the lightning, in miles. If the time waited is less than 30 seconds, you need to get to a safe location--the thunderstorm is within six miles, and is dangerous. Wait at least 30 minutes after the last clap of thunder before leaving your place of shelter.

When a safe location is not nearby, the following rules will help lessen the threat of being struck by lightning while outside. Do not seek shelter under tall isolated trees or objects; lightning typically tends to strike the tallest object first. Do not seek shelter under partially exposed buildings; with no barrier, lightning can still strike there. Stay away from metal objects such as fences and poles; metal is an excellent conductor of electricity, and the current from a lightning flash can travel long distances. If lightning is in your immediate area, and there is no safe location nearby, increase the spacing between yourself and all the people in your group, making it more difficult for the lightning to travel directly from one person to the next. Keep your feet together, and sit on the ground out in the open. But run to a vehicle or fully enclosed building, if possible, as it is still safer than sitting on the ground out in the open.

There is no safe place out on the water during a thunderstorm…and no such thing as a lightning-proof boat, only a lightning-protected boat. Small boats of wood and fiberglass construction, especially sailboats, do not provide grounding protection, and are particularly vulnerable to lightning strikes, since any projection

above the flat surface of the water acts as a potential lightning rod. When lightning strikes a boat, the electrical current is searching any route to the ground, and the human body is an excellent conductor of electricity. In many cases, weekend sailors are not aware of their vulnerability to the hazards of lightning. Boats can be protected from lightning strikes by properly designed and connected lightning protection systems, yet most boats are not so equipped.

The vast majority of lightning injuries and deaths on boats occur where there is no cabin. It is crucial to know the weather forecast when on a boat without a cabin. If thunderstorms are forecast, do not venture out on the lake. If you are on the water, and skies are threatening, get back to shore immediately, and seek safe shelter. What should you do if on a small boat, and lightning becomes a threat? If the boat has an anchor, properly anchor the boat, and get as low as possible. Avoid contact with wet ropes, as these make excellent conductors that an electrical current will travel along. Larger boats with cabins, especially those with lightning protection systems properly installed, are relatively safe. Lightning protection systems do not prevent lightning strikes. They may, in fact, increase the possibility of the boat being struck. The purpose of lightning protection is to reduce the damage to the boat and the potential for injuries or death to the passengers. Remember to stay inside the cabin, away from metal surfaces, and do not use the radio unless it is an absolute emergency. The most important rule: know the forecast, and monitor NOAA Weather Radio for the latest weather information.

UPPER AIR OBSERVATIONS AND FORECAST QUALITY

Evan L. Heller
Meteorologist, NWS Albany

One of the important services provided by the National Weather Service is upper-air observations. Albany is one of 92 NWS Upper-Air observing stations across the United States and its possessions that perform routine upper-air observations as part of the NWS's Upper-air Observations Program. An Upper-Air observation, or run, provides a snapshot of conditions in the atmosphere, usually to as high up as 20 miles or more. This is accomplished by the launching of a lightweight radiosonde attached to a large lighter-than-air balloon designed to withstand the extreme conditions it encounters on its ascending trip through the atmosphere. The vast majority of stations routinely fill their balloons with helium. The radiosonde itself is an instrument that continually measures pressure, temperature and relative humidity, and calculates wind direction and speed based on the instrument's motions, throughout its journey. These motions are tracked by satellites. Most of the stations routinely perform two upper-air runs per day, 12 hours apart; one in the mid-morning, and one in the early evening. Additional, special, upper-air runs are occasionally performed by offices anticipating significant or rapidly-changing weather conditions.

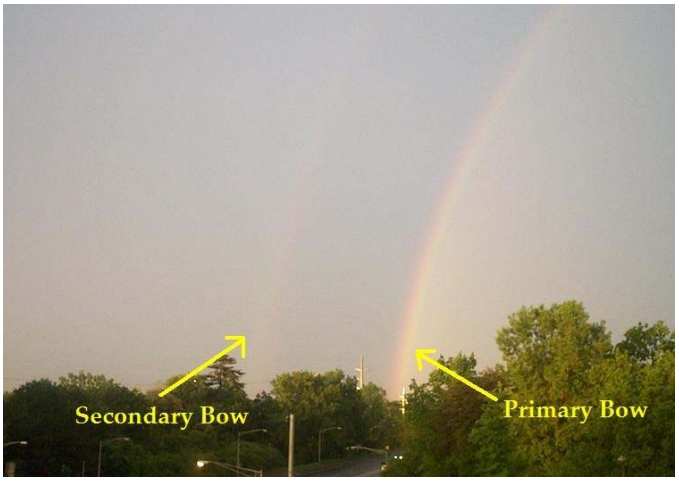
Upper-air data is a vital part of the process that goes into the making of timely and accurate forecasts. The coded meteorological data collected during an upper-air run produces a sounding, which graphically depicts the changes in the various weather parameters within the more or less vertical slice of the atmosphere through which the radiosonde traveled. Data produced also are input into formulas which calculate various parameters that aid in the forecasting of significant events such as the potential for severe weather and heavy rainfall, important summertime concerns. The data is also used by NWS's National Centers for Environmental Prediction (NCEP), located in Camp Springs, Maryland. Here, data is ingested from the observations into computer models which, in turn, produce digital guidance products and maps that NWS meteorologists utilize in creating their forecasts.

Of course surface observations are important, but without reliable data from the levels of the atmosphere that drive weather systems, forecasting would be a tremendous challenge, like it was prior to World War II, when upper-air observations were performed using low-flying planes and kites, which normally could not get more than about 20,000 feet up into the atmosphere. Luckily, we've come a long way since then. Balloons are made more durable, and can reach levels in the atmosphere which airplanes, and certainly kites, previously could not. Additionally, with their horizontal mode of travel, it was hard for airplanes to be able to get an adequate vertical representation of the atmosphere. Radiosondes have also improved, with better designs and instrumentation. The ground equipment and computer software systems which monitor and process data have continually undergone

improvements, as well. And further improvements are sure to come.

As one of a team of six upper-air observers here at the Albany office, and as our Upper Air Program Leader, I strive for the consistent production of high-quality upper-air data. We do the best we can to get in our two runs per day. But on occasion, mechanical things go wrong that are beyond our control, and we end up without an upper air run. When a station misses an observation, it means there's a 'hole in the grid' over that part of the country, and important upper-air information gets left out of NCEP's models. It follows that the spatial resolution of the data in and around that area decreases, values need to be interpolated, and forecasts are not as reliable. Thus, the importance of the NWS Upper-air Observations Program in the forecasting process can not be understated. For more information about it, you may visit the following internet link: http://www.ua.nws.noaa.gov/.

DOUBLE RAINBOW



A double rainbow was observed at the National Weather Service office in Albany, NY at 8:00 pm on May 30, 2006. The view is to the east. Showers and thunderstorms had just cleared the area, but heavy rain was falling to the east. Clearing was moving in from the west, allowing the last rays of the setting sun to interact with the falling rain to create a double rainbow. With the rainbow occurring close to sunset with the sun near the horizon, just about the entire rainbow was visible. The inner primary bow is the result of two refractions, and an internal reflection of the sunlight by rain drops. The secondary rainbow is the result of two refractions and two internal reflections of the sunlight by the rain drops. The secondary bow is fainter than the primary bow and occurs in an arc about 9 degrees wider than the primary bow.
(Photo and caption: Courtesy of Ray O'Keefe, Warning Coordination Meteorologist, NWS Albany)

NWS ALBANY'S FIRST AVIATION SUB-REGIONAL CONFERENCE

Hugh Johnson
Meteorologist, NWS Albany

As National Weather Service Albany's Aviation Program Leader, I, along with NWS Eastern Region Aviation Manager Jason Franklin, hosted our local office's first-ever Aviation Sub-Conference on Wednesday, May 24, 2006, in our Center for Environmental Science and Technology Management (CESTM) auditorium. Two dozen individuals, including Aviation Program Leaders from: Binghamton; Burlington; New York; Boston; Charleston, West Virginia; and Gray, Maine were present. Also in attendance were: Flight Aviation Administrators with the Federal Aviation Administration, based at Albany International Airport; a meteorologist for Southwest Airlines; a scientist from the Massachusetts Institute of Technology (MIT); and the Meteorologists In Charge (MICs) from two Central Weather Service Units (CWSUs).

I opened the session, introducing both our Warning Coordination Meteorologist, Ray O'Keefe, and our MIC, Gene Auciello. Gene spoke for a few moments, thanking all for attending the session. A video presentation by the Director of the National Weather Service, Gen. D.L. Johnson, stressed the importance of service to our customers, and receipt of their feedback.

Six presentations followed. Jason Franklin discussed the Instrument Flight Rules (IFR) verification of the aviation products issued by the National Weather Service, asserting that, as a whole, Eastern Region had met the national Government Performance and Results Act (GPRA) goals for accurate forecasting of IFR conditions.

Mark McKinley, CWSU Oberlin, Ohio MIC, talked about an experimental computer model that shows strong potential for early and accurate detection of thunderstorms, and which would be of great value to the aviation industry. In addition, he emphasized the positive impact of accurately-forecast weather elements, such as thunderstorms, and how the information affects how air traffic controllers utilize airspace over a large domain.

Scott Reynolds, MIC of the Nashua, New Hampshire CWSU, detailed how accurate and timely

Terminal Aerodrome Forecasts (TAFs) are crucial to operations at all of the nation's CWSUs.

Rick Curtis, Meteorologist from Southwest Airlines, talked about the impact of the TAFs on his airline's operations, which include a number of daily flights into and out of Albany International Airport.

After a lunch break, Dave Clark, our scientist from MIT, presented a conceptual model designed to assist with the forecasting of low clouds and fog, both of which have historically represented a real challenge for the aviation industry.

Chris Leonardi, Aviation Program Leader at NWS Charleston, West Virginia, discussed the concept of extrapolating our TAFs directly from the Weather Service's extensive digital database (the present source of our public forecasts). Results from early trials were mixed, and this remains a work in progress.

We ended the six hour conference with an open forum for discussions of concern to aviation, and for suggestions as to the ways the National Weather Service could improve upon its service to the aviation community. In general, the two dozen individuals gave their kudos to Albany's aviation program. Rick asserted that he would like the TAFs to be simple, straight-forward and as accurate as possible. He understands the natural decrease in accuracy that occurs with time within the TAF, and so would rather have a fully updated TAF that's precise instead of one that reflects more uncertainty through an extended period.

All the presentations can be viewed on-line by going to:
http://cstar.cestm.albany.edu/Aviation/presentations.htm

ALBANY'S HO-HUM SPRING OF '06

Evan L. Heller
Climatologist, NWS Albany

It was almost a spring to forget in Albany, with no temperature records of any kind, and only two precipitation records. March kicked off the climatological season in Albany with a week or so of below normal temperatures. There were some fairly big temperature swings during the month. The coldest day was the 3rd, with a mean temperature of 19.5º, while the warm day was the 31st, with a mean of 54.0º This was the 9th day in a stretch of above normal temperatures that helped push March above normal, by exactly 1.0°. The average for the month was 36.0°, with the average high being 46.2º (1.7º above normal), and the average low being 25.8º (0.4º above normal). Eight days of the month were more than 5 degrees below normal. The coldest reading attained during the month was 13º, on the 2nd, while the warmest reading was 75 º, on the 31st. The low maximum temperature was 24º, on the 3rd, while the high minimum reading was 44º, on the 13th. Mercuries fell below freezing during 24 days of the month, and there were 3 days during which the thermometer failed to climb above freezing.

Precipitation for March totaled just 1.23" in Albany, not low enough to make any kind of list, but low enough to raise fire concerns around the region. The greatest one-day amount of precipitation was 0.74", on the 13th. Rain fell during 15 days of the month, on 8 of which it was measurable. 0.19" fell on both the 9th and the 14th, with the remainder of the days receiving 0.06" or less. The last of the season's measurable snowfalls came during true winter. 1.2" on the 15th wrapped it up for the season. Another 0.2" was received on the 1st, with non-measurable snowfall occurring on 7 other days. The 1.4" monthly total was well short of the 10.9" that is normal for March. There were 13 clear, 10 partly cloudy and 8 cloudy days during March, and thunderstorms occurred on the 13th and 14th. The peak wind speed was 53 mph, from the northwest on the 15th, with the windiest day being the 4th. The average wind speed that day was 19.3 mph. The calmest day, with an average wind speed of only 1.8 mph, was the 30th. The average wind speed for the month was 10.0 mph.

April was a little more interesting. About two-thirds of the month was above normal in Albany, resulting in an above normal April by 2.9º. The average was 49.5º. The average high for the month of 61.0º was 3.7º above normal, and the average low of 38.1º was 2.2º above normal. The warmest day was the 20th, with a mean temperature of 61.5º. The warmest reading for the month, 76º, was also recorded that day. The coldest day was the 5th, with a mean temperature of 36.0º The month's coldest reading, 26º, was recorded on the 9th. The low maximum temperature, 43º, occurred on the 4th, and the high minimum, 51º, occurred on the 15th. Mercuries dipped below freezing on 9 days in April. The growing season officially began in Albany on the 29th, as this was the season's last freeze date.

Precipitation for the month totaled 4.73", 1.48" above normal. However, this wasn't wet enough to crack a list, either. There was one record set during the

month…a daily precipitation record, and this occurred on the 23rd when 1.59" of rain fell. Precipitation fell during 13 days of the month, on 9 of which it was measurable. A tenth of an inch or more fell during 8 days, with 0.25" or more on 5 of these, and 0.50" or more on 3 of those. An inch or more was recorded on one other day, the 22nd. The last snowflakes of the season fell on the 4th and 5th. There were 14 clear, 13 partly cloudy and 3 cloudy days during April, and a thunderstorm occurred on the 13th. The peak wind speed was 40 mph, from the west northwest on the 1st. The average wind speed for the month was 9.1 mph, and the windiest day was the 15th, with an average wind speed of 15.1 mph. The calmest day was the 11th, with an average wind speed of just 4.0 mph.

May was quite rainy. It rained on all but 10 days of the month. The greatest one-day amount established the month's only record, when 2.16" fell on the 12th. The rain was measurable during 19 days of the month. A tenth of an inch or more fell on 11 of these days, 0.25" or more on 5 of those, and between one half and one inch on 3 of these. The 5.31" rainfall total may have been 1.64" above the month's normal, but it wasn't one of Albany's 10 rainiest Mays.

Temperature-wise, May was even more normal than March. The 58.6º average temperature for the month was just 0.5º above normal. The average high was 68.2º, 1.6º below normal, and the average low of 49.1º was 2.6º above. The 30th was the warmest day, and a hot one indeed. The mean temperature was 77.0º. It was also the date with the warmest reading, 89º, and the highest minimum temperature, 65º. The 21st was the coldest day, with a mean temperature of 45.5º, and it had the coldest reading for the month, 37º. But the low maximum temperature for the month of 53º occurred on the 14th.

There were 12 clear, 8 partly cloudy and 11 cloudy days during May. Thunderstorms occurred on the 17th, 18th, 26th, 30th and 31st, and dense fog occurred on the 4th, 17th, 27th, 28th and 31st. The average wind speed for May was 6.7 mph. The peak wind, 40 mph, from the north northwest, occurred on the 30th, and the windiest day, with an average wind speed of 17.0 mph, was the 22nd. The calmest day was the 28th, with an average wind speed of 2.2 mph.

Summing up the Spring of '06: The average temperature of 48.1º was 1.5º above normal, with the average high of 58.5º being 1.3º above normal, and the average low of 37.7º being 1.8º above. The 11.27" seasonal precipitation total was 1.18" above normal, and the 1.4" snowfall total was just a small fraction of the 13.9" normal.

WCM Words

Ray O'Keefe
NWS Albany Warning Coordination Meteorologist

With severe weather underway, a reminder to our Skywarn spotters – get those reports to us! If you observe reportable weather phenomena – get the information to us as quickly and safely as possible. These reports are critical to the National Weather Service's warning program.

We've had many questions concerning Skywarn spotter ID cards. Be sure to check out the Fall StormBuster due out in September. We'll have instructions there on how to obtain your spotter IDs.

There are several interesting articles in this edition. While few people will experience severe weather this summer – a tornado, or large hail, or destructive winds – just about everyone will be outside when a thunderstorm strikes. Read Gene Auciello's article on Lightning Safety Awareness Week and know what to do if a thunderstorm threatens. A core mission of the National Oceanic and Atmospheric Administration and the National Weather Service is to support safe and efficient transportation. Hugh Johnson discusses the efforts here in Albany to address NOAA's transportation goal. Evan Heller delivers a thorough review of the Spring 2006 season. Why do we launch balloons? Well as Evan Heller explains, that's where the weather is. And yes you can even enjoy my picture of the double rainbow observed here at the Albany National Weather Service office.

Have a safe summer. See you in the Fall.

From the Editor's Desk

As we head into the summer season, we present this typically light summer edition of Northeastern StormBuster. We hope you enjoy this season's offerings. Lightning Safety Awareness Week will probably be underway as this goes to press. Our lead article has important tips for lightning safety. The spring SkyWarn training season has officially ended, and we'd like to welcome all of our new SkyWarn Spotters aboard. We hope you have a wonderful summer…looks like it could be a hot one! We're looking forward to

being back with you in the next few months. The 2006 Fall SkyWarn training sessions schedule will be in our upcoming issue.