SkyWarn Newsletter

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Fall 2010

Summer in Review

By John La Corte - Senior Forecaster

What a Long Hot Summer it Was

Summertime elicits memories of lazy days, soaking in rays by the pool or lake, cookouts, picnics, the beach or maybe just hanging out in the back yard enjoying the fireflies on those warm humid evenings. Well the summer of 2010 provided ample opportunity for all those activities, and then some. It was a long hot summer that started early and ran late. This was in marked contrast to a year ago when it seemed the rain and the need for a sweater would never end.

The warmth actually began back in the spring when March abruptly reversed a trend by putting a halt to what had been a cold snowy winter. Since that time, every month has seen the entire state enjoying above normal temperatures. In fact, the months of June and July were the 5th and 4th warmest on record respectively in the city of Harrisburg. As the summer rolled on, it ended up warmer than normal over virtually all of the northeastern United States all the way down into the Carolinas (Figure 1).

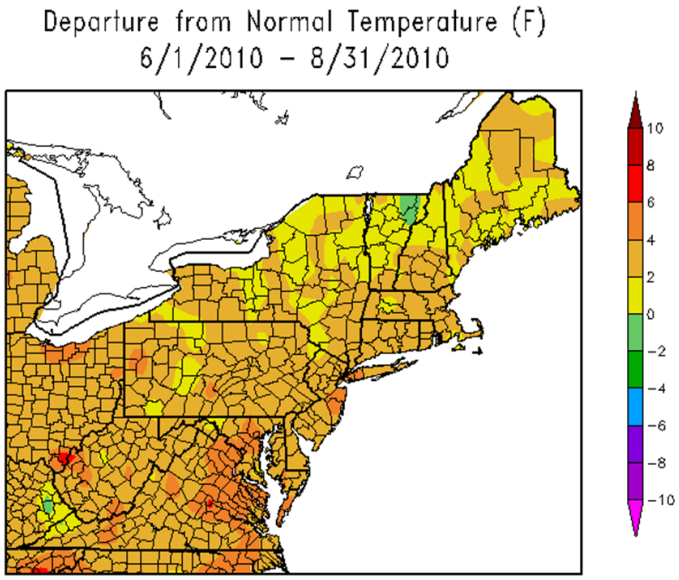

Figure 1. Summer Temperature Departures June-August 2010

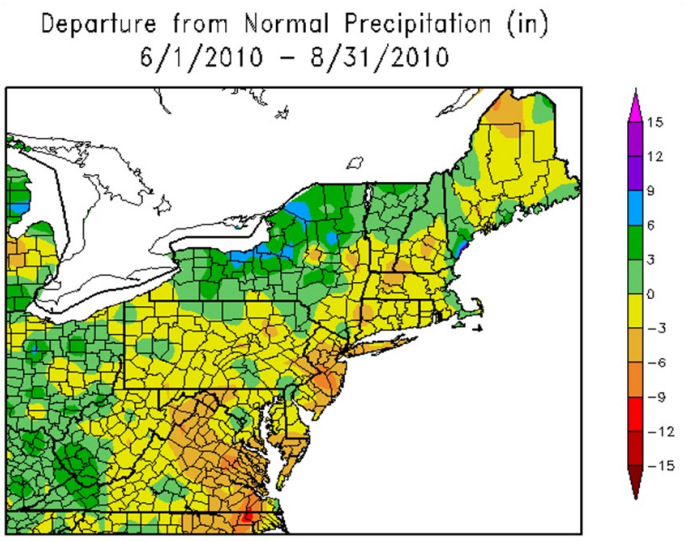

Figure 2. Summer Precipitation Departures June-August 2010

Precipitation cooperated with outdoor activities this year averaging dryer than normal over most of the area. Figure 2 shows that parts of the north, west and lower Susquehanna Valley were wetter than normal; otherwise most of the region was relatively dry. The dryness continued well into September when long term precipitation deficits (Figure 3) helped prompt drought watches and warnings. These deficits were only erased by the flooding rain storm that dropped as much as a foot of rain on the region during the last days of September.

Another way to gage the intensity of summer is by considering the number of days the mercury reaches 90 degrees. As one might expect, this happened frequently this year, much more frequently than last summer. This year Harrisburg saw 27 days of 90 degrees or better. In a normal summer that happens about 17 times. Williamsport hit 90 on 22 days; the normal there is about 11.

Precipitation was not terribly noteworthy overall, ending a little

Summer in Review cont.

wetter than normal in Harrisburg and a little drier than normal in Williamsport. However the number of dry days meant outdoor activities did not suffer much. Harrisburg can be expected to see measureable rain on about 30 days in an average summer, or roughly 1 day in 3. This year they only had 24 days. Williamsport, despite being drier than normal overall, was closer to their normal number of wet days experiencing 33. A normal summer has 34 days with some rain in Williamsport.

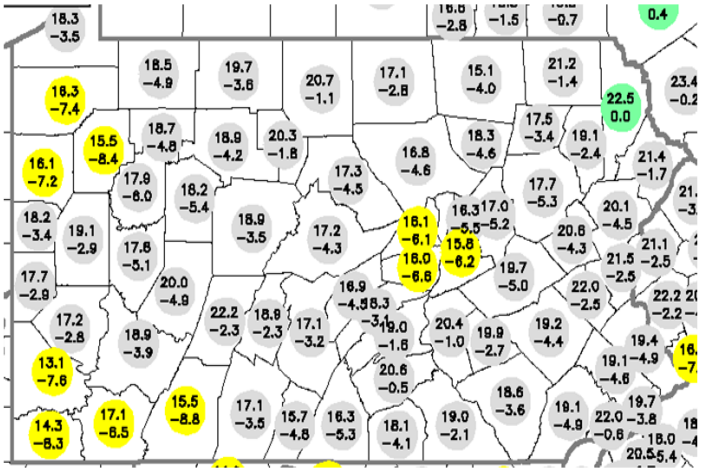

Figure 3. Precipitation and Departure from Normal mid March through mid September

Upcoming Season

So after a hot summer and what has so far been a warm autumn, what does winter have in store for us? We may remember last winter saw a return of snow and cold after several mild winters. Record snowstorms occurred in many areas from the mid Atlantic up through eastern Pennsylvania. This year the weather Gods are not tipping their hand much. In the current La Nina pattern, the signal for the upcoming months is weak over the northeastern US. The official forecast for temperature and precipitation from the Climate Predictions Center calls for "Equal Chances", meaning the probability of being above, below or near normal is just about equal for the region (Figs. 4 and 5).

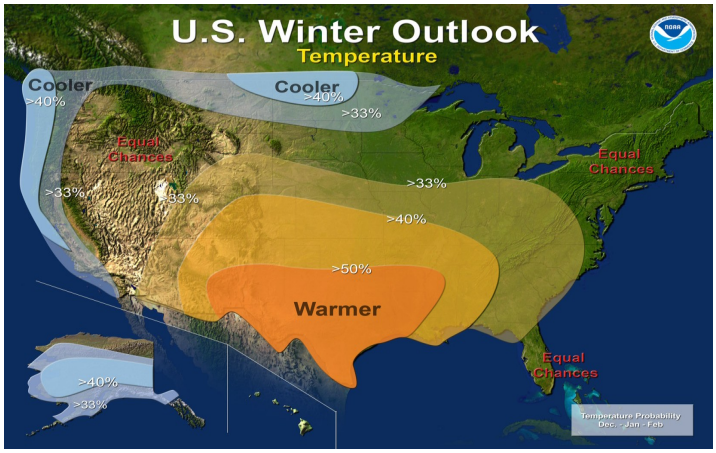

Figure 4 Extended Temperature Forecast for the Upcoming Winter

Figure 5 Extended Precipitation Forecast for the Upcoming Winter

Of course the winter outlook would not be complete without considering the forecast from the masters of long range forecasting at The Old Farmer's Almanac. They have been making their prognostications since 1792 when our country was young , largely agrarian and farmers depended on their words of wisdom. They still boast an accuracy of at least 80% in this day and age of Doppler radars, weather satellites, sophisticated atmospheric models and high powered computers.

This year they predict our region to be colder than normal and a bit drier than normal. As for snowfall, northern parts of the state are expected to see near to below normal snowfall while in the south above normal is forecasted. See you all in the spring after we thaw out and take stock on just how good the forecast ended up being.

Tropical Season

For the hurricane enthusiasts among us, 2010 was promised to be a banner year with a high probability of a very active season predicted. As of early November we have already had 19 named storms including 9 hurricanes. Four of those hurricanes attained category 4 status (winds at least 130 mph) at some point during their lifetimes. This compares with an average year where about 11 storms are named, and 6 reach hurricane intensity (Fig 6.)

The impact on the United States thus far has been relatively minor with Tropical Storms Bonnie and Hermine crossing southern Florida and Texas respectively, mainly causing some heavy rain and flooding. The season's most threatening hurricane to date has been Earl which took a classic track from the Cape Verde Islands to just north of the Virgin Islands, northeast of the Bahamas then curving up off the east coast of the US brushing the outer banks of the Carolinas and Cape Cod with some strong winds and rough surf.

Locally we were indirectly affected by the remnants of Tropical

Summer in Review cont.

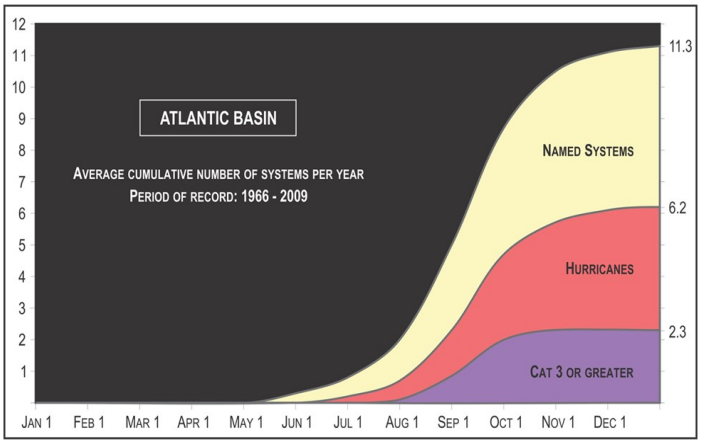

Figure 6 Tropical Cyclone Climatology

Storm Nicole which was a storm over the Floria Keys for barely more than a day at the end of September. It got absorbed into a strong frontal system that eventually brought widespread flooding rains from the southeastern states up through Pennsylvania into New England.

If these storms end up representing the worst of this active season, we will have gotten off lucky.

NOAA's Part in Rescue Missions

By Michael Dangelo - Senior Forecaster

NOAA is the parent agency of the National Weather Service. Another line office of NOAA is the federal agency that deploys many of our nation's civilian satellites. The National Environmental Satellite, Data, and Information Service (NESDIS) plans for new weather satellites, contracts for their construction, coordinates launches, positions and tracks the satellites, and monitors the data sent from them.

Our civilian satellites do more than just send pictures of the earth and clouds to the surface. They can also help to rescue people.

Many of the civilian satellites launched since 1982 have included – as part of their sensor package – location devices that are compatible with the Search and Rescue Satellite-Aided Tracking program (SARSAT). A companion program run by the Russian government (COSPAS) also places location devices on Russian civilian satellites. Together, the COSPAS-SARSAT international program has aided in the rescue of over 28,000 people worldwide since 1982. In just the first 8 months of 2010 alone, 205 people have been rescued in the United States using rescue beacon information obtained through the SARSAT program. These rescues include rescues at sea, on land, and those that involve aviation incidents.

The COSPAS-SARSAT system works when an emergency/rescue beacon is activated. Many satellites may then be able to pick up the distress signal. The satellites send the signal down to earth, where it is relayed to a mission control center (MCC). The US MCC is in Suitland, MD, and is run by NOAA's NESDIS. Using the data from the beacon, the US MCC will contact the authorities responsible for the area where the alert has originated, and alert them to the type of trouble being received. The rescue information may need to go to the US Coast Guard, or to the National Ski Patrol, or other Search and Rescue (SAR) teams.

NOAA's Part in Rescue Missions cont.

The rescue beacons compatible with the COSPAS-SARSAT system include tiny Personal Location Beacons (PLBs) typically used by hikers and other individuals, Emergency Position Indicating Radio Beacons (EPIRBs) used in maritime applications, and Emergency Locator Transmitters (ELTs) which are used in planes.

Most likely, the first type of rescue beacon you heard of was an ELT. However, the early ELT beacons did not send signals that could be received by satellites. These old ELTs were difficult to locate – since they had to be detected using a search plane that was close enough to hear the 121.5 MHz signal. Many of those early ELTs failed during a crash. Newer 406MHz ELTs have been designed to work with the COSPAS-SARSAT system. These new ELTs can send specific location data (Latitude and Longitude) and identification information (e.g. the tail number of the plane) that can reach an earth-orbiting satellite. These new ELTs are also much more likely to survive a crash, and provide specific information to rescuers. Any new US-coded 406MHz beacon must register with NOAA.

One very-recent COSPAS-SARSAT rescue effort became very highly-publicized. 16 year-old Abby Sunderland was attempting a solo sail around the world. When a storm over the Indian Ocean disabled her ship, Abby activated both her EPIRB and a PLB. With no mast, she could not use her satellite phone. The EPIRB and PLB were the only way Abby could alert authorities that she was in distress, and – importantly – where she was located. Abby had registered her beacons with the COSPAS-SARSAT system, which allowed the MCC to immediately recognize her, and give her exact position to rescue personnel – even on the opposite side of the globe. The difficulty came in actually getting to Abby and taking her to safety. Many international agencies coordinated to rescue Abby. But without the EPIRB and PLB information relayed by the satellites, finding her would be nearly impossible in such a vast ocean.

For more information on SARSAT, see:

http://www.sarsat.noaa.gov/

Automated Email Verification (AEV)

By Ron Holmes - Information Technology Officer

Severe storm verification is very labor intensive and tedious work. It involves identifying which warnings have not been verified with severe storm reports and then basically cold calling individuals asking if there was storm damage in their area within the warning time. This method of verification has existed since phones were invented. Determining who to call is also time consuming. If we have enough man power (during a big event a lot of the staff is out of the office on storm damage surveys) we must load the radar data from the previous day when the warning was in effect. Then we must overlay our spotter location map to see which spotter was near the storm at the time of the warning and try to contact them. However there are some problems with this time-intensive method. There are times the call is not answered, especially during the day when people are at work. Also many of our spotters have specified to only contact them during certain times of the day. With time, people move and phone numbers change and become out of date.

Most people today have computers and cell phones to receive and send email and send text. That number is increasing every year. Couple that with picture-taking cell phones distributed over a vast network of observers and our chances of verifying storms increases. During the late summer work started on an automated method to increase our severe storm verification using email.

The Automated Email Verification program (AEV) was written to actively match up severe storms with spotters within the vicinity of that storm (and within the warning polygon) and send an email to the spotter asking them to reply with any verification. Our AWIPS system already identifies severe storms via a storm tracking algorithm and gives latitude/longitude coordinates (as well as other severe storm information including estimated hail size) of each storm cell, mesocyclone, and tornado vortex signature. The AEV uses this information to cross-match each severe cell identified by the radar with a warning polygon for each county. Those cells that are contained within the warning polygon are then matched up with our storm spotter locations. For each cell that is identified, a 5 mile radius is computed around the cell and those spotters that lie within this umbrella are identified for emailing.

This whole process is repeated every 5 minutes. To cut down on over-emailing a spotter for a particular warning, once a spotter has been emailed during that warning they are not emailed again. However, if another warning is issued at a later time and another storm moves over their location then they might receive a second email.

The body of the email contains the date/ time that the storm moved within a 5 mile radius of their location and a brief message to please reply back to the sender if they have received storm damaging winds, hail the size of a penny or larger, or reports of flooding. The reply email then goes to a general email account (our ctpwebmaster account) that several people can access and pass on to the rest of the staff.

A screen shot of the graphical portion of the program output is shown below (spotters identity blanked out for confidentiality) in Figures 1a and 1b.

Automated Email Verification (AEV) cont.

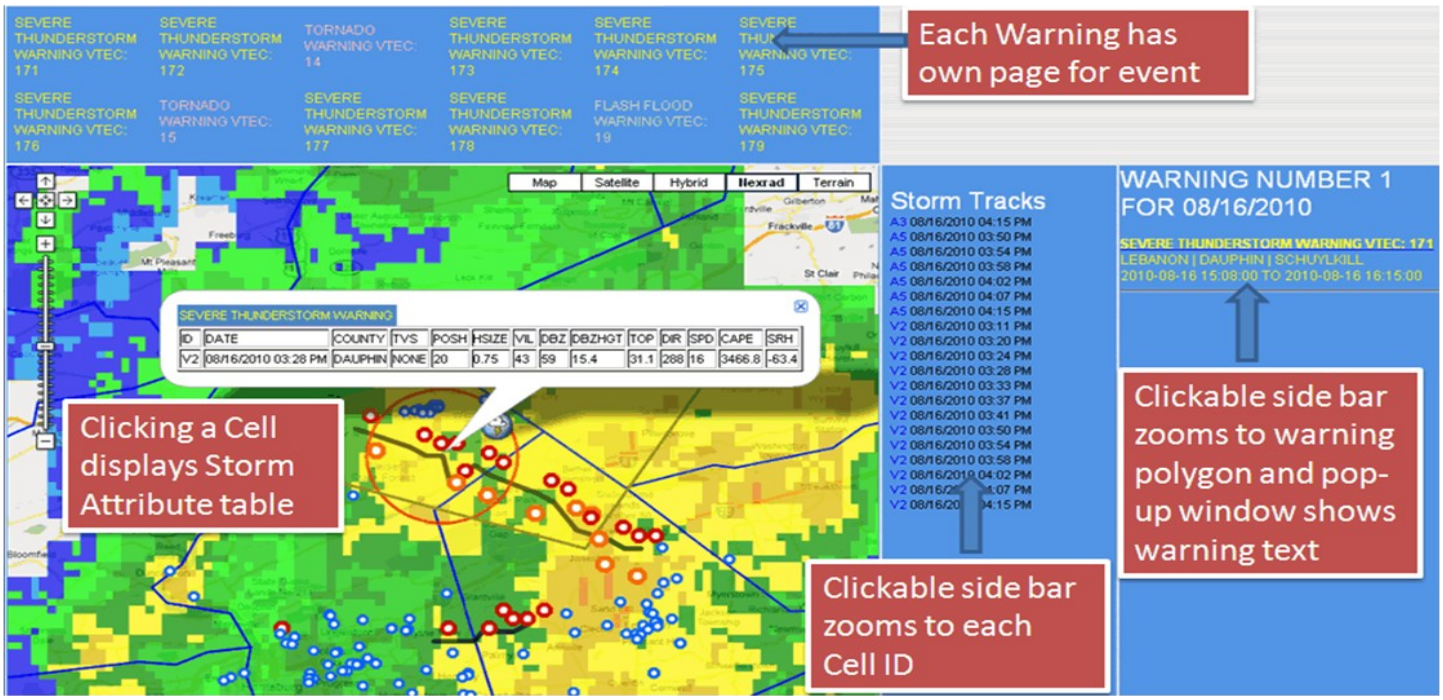

Figure 1a. Storm plot and track with warning information

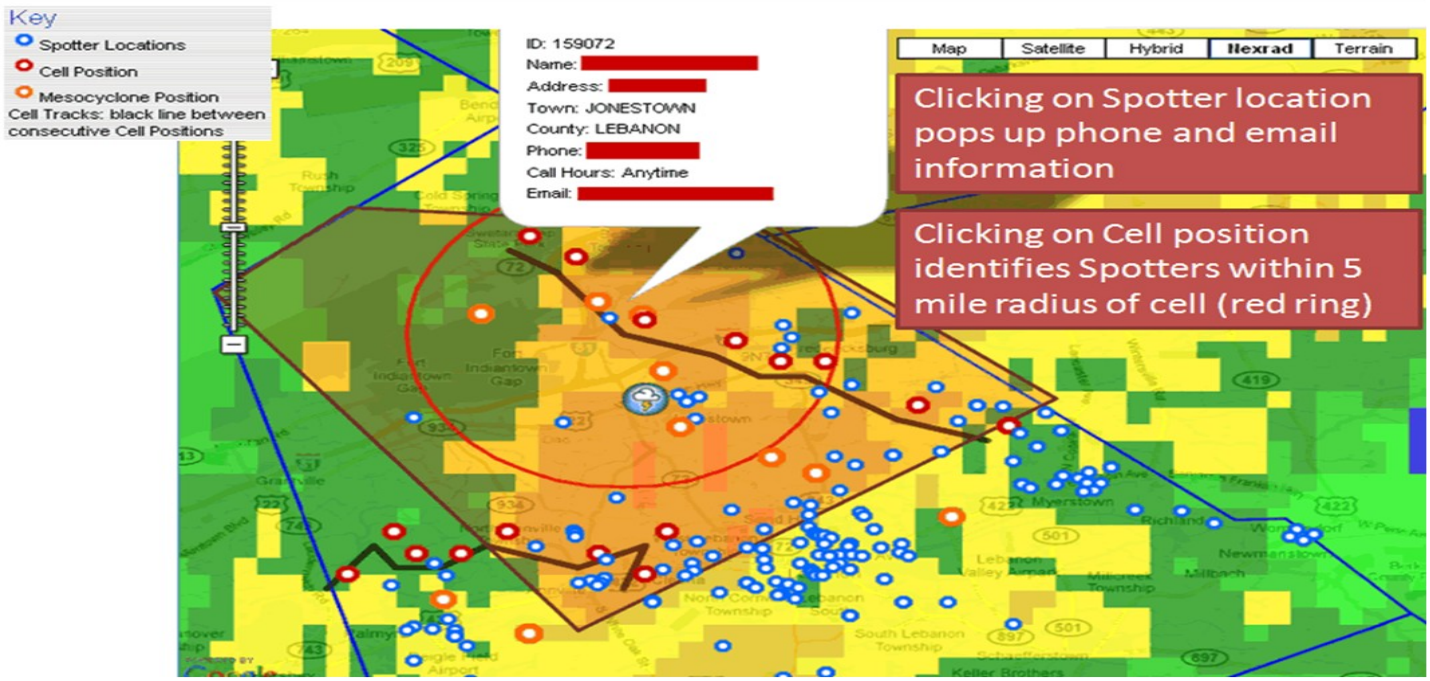

Figure 1b. Storm plot and spotter information

Black Ice – The Invisible Danger

By Joe Villani—General Forecaster Albany NY

There are many hazards in the winter time that cause drivers problems. Snow, sleet, and freezing rain are all common occurrences in Central Pennsylvania and most people are aware of the dangers associated with these types of winter precipitation. Also, it is typically not a challenge to determine if roads might be slippery since we can see snow, sleet or freezing rain falling on the ground or hitting our windshields. Black ice on the other hand, can be very dangerous and can occur under clear and tranquil weather conditions.

Let's take a closer look at black ice and define what it is. Black ice is ice (usually clear) that forms on ground surfaces, typically due to snow melting and re-freezing. Since it is almost invisible, it is difficult for drivers to recognize when black ice is on a road. Ground surfaces that look dry, but appear as slightly different shades signify the presence of black ice. When in poorly lit areas, black ice is nearly impossible to spot and can result in serious and possibly fatal accidents. In situations where black ice may be present, people should drive at slower speeds and allow extra time for braking. Also, make sure to leave plenty of space between your automobile and the vehicle in front of you. Many winter driving accidents occur due to motorists not being cautious enough and not recognizing potentially hazardous road conditions.

Here are a couple of situations that are favorable for black ice formation. Black ice can cover a road even after a sunny day. Snow banks may melt after a day in the sun, with water trickling onto roadways and then re-freezing after sunset.

People should not let their guard down even when no winter precipitation is falling or has fallen recently. Another way black ice can form is when it rains or snows during the day or evening, then temperatures fall to freezing or below (32 degrees Fahrenheit) when it gets dark. While the air temperature is important in allowing black ice to form, ground surface temperature is the main indicator for black ice formation. Even when the air temperature is below 32 degrees during the day, road temperatures may be well above freezing. However, as soon as the sun sets, road temperatures can drop rapidly, allowing for black ice to form quickly.

Another way black ice can form is one that really catches motorists off guard. After prolonged very cold conditions, we can sometimes see a rapid warm up with very moist air pouring back into the region. If this occurs at night, the moisture can actually condense on the still below freezing roads and walkways and cause a thin layer of ice to form. It is especially misleading because air temperatures may actually be well above freezing. Because the ground loses its heat slower than the air, the pavement can remain below freezing and cause the black ice to form, sometimes with disastrous results.

People should always be aware of black ice in the evening, overnight, and morning hours when the air temperature is near or below 32 degrees. Not only should motorists be concerned about black ice, but pedestrians should be as well. Slipping on black ice while on foot can result in serious injury. Personally, I have had a run-in with black ice. Back in college I slipped in a parking lot during the evening hours, on pavement that looked "dry". Fortunately for me, I landed on my back and avoided serious injury. A friend of mine however, was not so lucky. He slipped on black ice on the steps just outside of his apartment and tore his Anterior Cruciate Ligament (ACL), which required surgery. So as you can see, black ice can be very hazardous when on foot too.

In summary, just because snow, sleet, and freezing rain get all of the headlines during the winter season, don't forget about black ice and its associated dangers to both drivers and pedestrians.

Winter Weather Driving - A Challenge Under the Best of Circumstances

By John La Corte—Senior Forecaster

Even under the best of conditions, winter driving is tough on motorists and their vehicles. With a little preparation though, drivers can make it through the toughest driving conditions.

1. Charge It - Cold weather is hard on a battery. Keeping battery terminals clean helps, but a load test by a qualified technician will determine if your battery has what it takes this winter. Also check flashlight batteries and cellular phone batteries.

2. Get a grip - Before winter arrives, make sure your car is equipped with tires that are able to handle winter weather.

Winter Weather driving cont.

3. See and be seen - Clear windows, mirrors and lights. Keep windshield wipers and defrosters in good working order and washer reservoirs filled with no-freeze windshield washer fluid.

4. Slippery when wet - In temperatures around 32 degrees, a thin layer of water can cover road ice, causing extremely slippery conditions. The distance needed to stop greatly increases.

5. Keep your engine cool - Make certain cooling system antifreeze is mixed with an equal portion of water for maximum protection.

6. Key solution - Frozen door locks can be overcome by carefully heating the end of a key with a match or a lighter. A squirt of de-icer spray is another remedy.

7. Air it out - Don't start your car in a closed garage or idle your engine with windows closed. Carbon monoxide, present in exhaust fumes, is almost impossible to detect and can be fatal.

8. Finish up - Road salt, slush and grime are especially hard on car's finish. To help prevent rust and paint damage, keep cars washed and waxed.

Have a Winter Survival Kit

A winter survival kit costs less than $75, but it could save your life:

1. Coffee Can Furnace (a candle lit inside a coffee can generates heat)
2. Carpet Strips (for traction under drive wheels)
3. Boots
4. Ice Scraper & Brush
5. Flares & Reflectors
6. Jumper Cables
7. Newspapers (great insulation when placed between skin and clothing)
8. Shovel & Sand or Cat Litter (for traction)
9. Tools & Flashlight
10. First Aid Kit
11. Food & Blanket
12. Tire Chains (for use on secondary roads only)
13. Prepaid Cellular Phone
14. NOAA Weather All Hazards Radio

Remember, it's usually best to remain with a stranded vehicle rather than to risk exposure or become lost while walking for help.

Review of Snow Measurement Guidelines

By Greg DeVoir—Senior Forecaster

Each season before the first snows come, review these instructions for measuring snow. It is easy to forget what needs to be measured, but a quick review will have you off and measuring properly in no time!

- At the beginning of each snowfall/freezing season, remove the funnel and inner measuring tube of the eight-inch manual rain gauge to expose the 8-inch diameter overflow can so that it can more accurately catch frozen precipitation.
- Put your snowboard(s) out and mark their location with a flag or some other indicator so they can be found after a new snowfall. They should be located in the vicinity of your station in an open location (not under trees, obstructions, or on the north side of structures in the shadows).
- Check your gauge to make sure there are no leaks. If there are leaks, take appropriate action. Once your equipment has been readied for winter you are prepared for taking snowfall measurements.

Snow Measurement cont.

Observers should determine three values when reporting solid precipitation. They are:

1. Measure and record the snowfall (snow, ice pellets) since the previous snowfall observation.

2. Determine the depth of snow on the ground at the normal observation time.

3. Measure and record the water equivalent of snowfall since the previous day's observation.

Measure and record the greatest amount of snowfall that has accumulated on your snowboard (wooden deck or ground if board is not available) since the previous snowfall observation. This measurement should be taken minimally once-a-day (but can be taken up to four times a day, see note below) and should reflect the greatest accumulation of new snow observed (measured to the nearest tenth, e.g. 3.9 inches) since the last snowfall observation. If you are not available to watch snow accumulation at all times of the day and night, use your best estimate, based on a measurement of snowfall at the scheduled time of observation along with knowledge of what took place during the past 24 hours. If you are not present to witness the greatest snow accumulation, input may be obtained from other people who were near the station during the snow event. If your observation is not based on a measurement, record in your remarks that the "snow amount based on estimate".

Remember, you want to report the greatest accumulation since the last observation. If snowfall occurred several times during the period, and each snowfall melted either completely or in part before the next snowfall, record the total of the greatest snowdepths of each event and enter in your remarks "snowfall melted during the OBS period". For example, three separate snow squalls affect your station during your 24-hour reporting period; say 3.0, 2.2, and 1.5 inches. The snow from each squall melts off before the next one begins and no snow is on the ground at your scheduled time of observation. The total snowfall for that reporting 24-hour day is the sum of the three separate snow squalls, 6.7 inches, even though the snow depth on your board at observation time was zero. Snow often melts as it lands. If snow continually melts as it lands, and the accumulation never reaches 0.1 inches on your measuring surface, snowfall should be recorded as a trace (T) and recorded in your remarks that the "snow melted as it landed".

It is essential to measure snowfall (and snow depth) in locations where the effects of blowing and drifting are minimized. Finding a good location where snow accumulates uniformly simplifies all other aspects of the observation and reduces the numerous opportunities for error. In open areas where windblown snow cannot be avoided, several measurements may often be necessary to obtain an average depth and they should not include the largest drifts. In heavily forested locations, try to find an exposed clearing in the trees. Measurements beneath trees are inaccurate since large amounts of snow can accumulate on trees and never reach the ground.

If your daily schedule permits, you may wish to make a snowfall observation every 6-hours, beginning with your regularly scheduled time of observation. This is the procedure followed by National Weather Service Forecast Offices. Follow the same rules for a once-a-day observation, but the snow accumulation reported will be the greatest for the previous six hours instead of 24 hours. If you take your observations at this frequency, make sure that you clear your snowboard (or other measuring surface) no more than once every 6 hours. Record the frequency of observations during the day in the comments section of your report. Never sum more than 4 six-hourly observations to determine your 24-hour snowfall total. If you use more than four observations, it would falsely increase snowfall totals.

Freezing rain (glaze ice) should never be reported as snowfall. This precipitation type is liquid precipitation and should be reported as such.

Determine the total depth of snow, ice pellets, or ice on the ground.

- This observation is taken once-a-day at the scheduled time of observation with a measuring stick. It is taken by measuring the total depth of snow on exposed ground at a permanently-mounted snow stake or by taking the average of several depth readings at or near the normal point of observation with a measuring stick. When using a measuring stick, make sure the stick is pushed vertically into the snow until the bottom of the stick rests on the ground. Do not mistake an ice layer or crusted snow as "ground". The measurement should reflect the average depth of snow, ice pellets, and glaze ice on the ground at your usual measurement site (not disturbed by human activities). Measurements from rooftops, paved areas, and the like should not be made. Note: Even though the depth of hail (usually associated with spring, summer, or fall thunderstorms) at observation time is also reported in the same manner as snow depth, make sure you record in your remarks that the "accumulation on ground is from hail."

- Report SNOW DEPTH to the nearest whole inch, rounding up when one-half inch increments are reached (e.g. 0.4 inches gets reported as a trace (T), 3.5 inches gets reported as 4 inches). Frequently, in hilly or mountainous terrain, you will be faced with the situation where no snow is observed on south-facing slopes while snow, possibly deep, remains in shaded or north-facing areas. Under these circumstances, you should use good judgment to visually average and then measure snow depths in exposed areas within several hundred yards surrounding the weather station. For example, if half the exposed ground is bare and half is covered with six inches of snow, the snow depth should be entered as the average of the two readings, or three inches. When in your judgment, less than 50 percent of the exposed ground is covered by snow, even though the covered areas have a significant depth, the snow depth should be recorded as a trace (T). When no snow or ice is on the ground in exposed areas (snow may be present in

Snow Measurement cont.

surrounding forested or otherwise protected areas), record a "0".

- When strong winds have blown the snow, take several measurements where the snow was least affected by drifting and average them. If most exposed areas are either blown free of snow while others have drifts, again try to combine visual averaging with measurements to make your estimate.

Measuring the water equivalent of snowfall since the previous day's observation.

- This, measurement is taken once-a-day at your specified time of observation. Melt the contents of your gauge (by bringing it inside your home or adding a measured amount of warm water) and then pour the liquid into the funnel and smaller inner measuring tube and measure the amount to the nearest .01 inch (use NWS provided measuring stick) just as you use for measuring rainfall. **Do not measure the melted precipitation directly in the large 8-inch outer cylinder**. Make sure the inner measuring tube can't fall over when pouring the liquid into it. If the melted water equivalent (including any added warm water) exceeds two inches and cannot fit into the measuring tube all at one time, then empty the full measuring tube and pour the remaining liquid from the large 8-inch outer cylinder into the emptied measuring tube. Then, add and record the water equivalent of the multiple measurements.
- If you added warm water to the gauge to melt the snow, make sure you accurately measure the amount of warm water added before pouring it into the gauge. Then, when you take your liquid measurement, subtract the amount of warm water added from the total liquid measurement to get your final liquid water equivalent of the snowfall.
- As winds increase, gauges collect less and less of the precipitation that actually falls. Generally speaking, the stronger the wind and the drier the snow, the less is captured in the gauge. If you notice that less snow is in the gauge than accumulated on the ground, you should first empty any existing snow from inside the 8-inch cylinder, then use it to take a snow sample, sometimes referred to as "take a core" or "cut a biscuit" from your snow board with the 8-inch overflow can. Melt the biscuit of snow; pour the liquid into the small measuring tube to measure the water equivalent.

What happens to bugs in the winter…

by Kevin Lipton — General Forecaster Albany NY

Ever wonder what happens to insects in the winter? As the weather gets colder, and the days shorter, we usually see fewer bugs around, until one day – they may be difficult to find at all. Does that mean they simply vanish, only to reappear when the weather warms the next spring? Or do they all take cover in our warm homes, ready to spring on us at the first opportunity?

Insects, similar to birds, are cold-blooded. In other words, their internal temperatures are highly dependent on what the environmental temperature is. This is different than warm-blooded animals, such as humans, which maintain a relatively steady internal temperature, independent of their external temperature. Thus, for insects, colder weather can severely impact their daily activities, even to the point of death. So – with this sensitivity to external temperatures – how in the world can insects survive the winter? Well, different insects have various ways of coping with colder weather. One method of coping is by simply migrating to a warmer location. Obviously, only insects with wings can do this – and only a select few of them do. Butterflies are one type of insect that migrates to warmer climes – in particular, the Monarch Butterfly often migrates to areas of northern Mexico. Other types of butterflies migrate to the southern United States during wintertime.

Another way in which some insects survive the winter is by slowing their activities into a “dormant” state. This “dormant” state is also known as diapause. During this state, insects remain inactive – all activities are temporarily suspended. Insects neither grow nor develop during this state – and their metabolic rate is kept just high enough to barely keep them alive. This is essentially a “hibernation” state. Additionally, insects reduce the water content of their bodies, which reduced the threat of them freezing to death. Perhaps more shockingly, many hibernating insects actually build up glycerol in their bodies during the fall, which acts as an antifreeze during the cold winter months.

Some insects, such as honey bees, cluster tightly together during winter months in hives, allowing the temperature of the

Bugs cont.

hive to remain warmer than outside by vibrating their wing muscles. Where do they get the energy to do this? It's in the honey they collect during the warmer months.

Many other insects remain alive through the winter through a process known as "overwintering." However – they do this in different forms. One way of "overwintering" is by existing as immature larvae. For instance – caterpillars often do this by sheltering themselves with heavy covers of leaf litter, while grubs tend to burrow more deeply into the soil. Other insects overwinter as nymphs – which means they exist in a smaller, immature form of their parents. They nymphs sometimes overwinter in waters of ponds and streams – and even beneath ice. They even feed and grow during the winter months. Some of these nymphs include dragonflies and stone flies, as well as springtails. In fact – sometime springtails can be seen on snow during the winter on relatively mild days – their hopping motion gives then the nick name of "snow flea."

Of course – the easiest way to overwinter for any insect is to seek shelter in a warmer environment – which many spiders and ladybugs try to do during the late fall – such as entering homes!

Needless to say, insects do not simply disappear when the colder weather arrives. Although many do not survive the long, harsh winter, many insects do remain alive, just in a less active state during winter, only to become more active when spring arrives. Or, they just move to a more conspicuous location than during the warmer months. So – next time you wonder where all the bugs have gone – you just have to look harder, and you just might find them! But don't expect them to move terribly fast.

Several other insects and insect-like creatures overwinter as eggs – which were deposited by adults during the fall. Spiders often do this – they lay eggs during the fall, which then remain encased in egg sacs until the warm weather returns.

Welcome Aboard and Winter Weather Reporting Reminder

by Bill Gartner — General Forecaster

SkywarnNews would like to welcome the nearly 200 new Skywarn Spotters that were trained this year and thank you again for your interest in helping us to protect the lives of those living or visiting Central Pennsylvania.

With the approach of winter, now is the time to remind new and current spotters alike of our winter weather reporting criteria. While most of our Spotter training classes focus on summer time weather such as thunderstorms, tornadoes and flooding, **YOUR** spotter reports of winter weather are also extremely important. They help us to monitor ongoing winter storms, determine the need for changes to advisories and warnings, and provide real-time snowfall totals to the public, news media, NWS customers and other NWS offices.

Additionally, just like reports of wind damage and hail help us to verify severe thunderstorm warnings, your winter time reports are also used to verify our winter watches and warnings, as well as to prepare storm summaries and snowfall total maps of winter events.

Even if you are not able to call in reports during a storm, but can give us a post-storm total snowfall, we would still love to hear from you when the storm is over.

Please report the following:*

Snow:
- When snow accumulation reaches 3 inches

- When snow accumulation reaches 6 inches

- Storm total after the snow ends (also water equivalent if possible)
- When snow is falling at the rate of 1 inch or more per hour

Ice:
- ANY occurrence of or accumulation of freezing rain or drizzle
- Accumulation of ice of one quarter of an inch or more on trees or wires

Other:
- When forecast winter precipitation differs significantly from observed (i.e. snowing with no snow in forecast, sleet...when only snow is forecast...)

- Any other significant weather occurrence/oddity (i.e. flooding due to snow melt/ice jam, damage from strong winds not associated with a thunderstorm)

- And remember, thunderstorms that produce wind damage and flooding rains are still possible even in the cold months of the year.

*For your convenience, a list of reporting criteria is available on our web page, www.weather.gov/statecollege. Click on "--Send Us Reports" in the left-hand column. It is the fourth selection under the Current Hazards header.

Update Your Spotter Contact Information Reminder

by Bill Gartner — General Forecaster

Did you move recently? Did you change your cell or home phone number? Have you become a HAM radio operator and now have a call sign?

Help us to keep your contact information up to date. While we hope to get a phone call from you when severe or significant weather occurs (that is why you became a spotter, right?), from time to time we call spotters when significant weather is in their area to investigate what storms are doing. Thus, it is important to keep your contact information current. If any of your contact information (name, phone number(s), addresses, etc) has changed recently, please let us know. Send an email or 'snail mail' note to us at one of the addresses below.

If you are not sure that we have the most up to date information on file, go ahead and send us an email or note with your current information anyway.

Please note that your personal information (address, phone #, email mail address, etc) is NOT shared with or given to anyone else outside of the NWS (unless your permission is gained first) and is used only to contact you in the event of severe weather, send you SkywarnNews, or communicate important program changes.

Thank you!

Send an email or 'snail mail' note to us at one of the addresses below.

email: william.gartner@noaa.gov

U.S. mail:

William Gartner/Skywarn spotter update

NWS/WFO State College

328 Innovation Blvd, Rm #330

State College, PA 16803

Go Green…Save a tree

In our continuing efforts to save natural resources (by using less paper) and conserve government resources (by reducing printing and mailing costs), we provide spotters the option of being notified by email when a new issue of *SKYWARNNEWS* is available. Instead of getting *SKYWARNNEWS* in the mail, you can read it online or download and print it if you choose.

If you currently get the printed version and would like instead to be notified by email, send an email to william.gartner@noaa.gov and include 'SKYWARNNEWS via email' or something similar in the subject line. Please be sure to include your name, spotter ID # and the county in which you live in the body of the email.

SKYWARNEWS

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TO: