SKYWARNEWS

NATIONAL WEATHER SERVICE STATE COLLEGE, PA

FALL 2015

“WORKING TOGETHER TO SAVE LIVES”

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The Summer of 2015 in Review...A Tale of Two Summers

John La Corte—Senior Forecaster

As the summer starts to fade in the rear view mirror, it’s time to take a look and see just what kind of season we had. Perhaps the most noteworthy aspect of the summer was the rain. The season started with June being very wet with almost all of southern Pennsylvania experiencing more than 200% of the normal rainfall (not shown). July was more of a mixed bag of wet in some areas and dry in others. It was all followed by an August that was much drier than normal over most of the region. The very wet June meant that most of Central Pennsylvania ended up wetter than normal for the season (Fig 1)

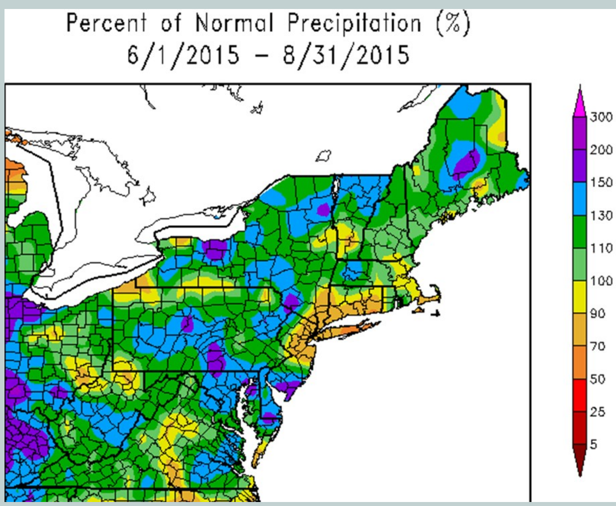


Figure 1. Summer Precipitation Departure

Temperatures also changed radically from the beginning to the end where June, while wet, was warmer than normal over most of the area (not shown). July and August saw temperatures return to near or even slightly cooler than normal which left the summer pretty much as another mixed bag with a stripe of warmer than normal readings over the central mountains and most of the Susquehanna Valley, while the remainder of the region was near or slightly cooler than average overall. (Fig 2)

(cont. p. 2)

Statistically Speaking Snow

Mike Dangelo—Senior Forecaster

You may ask: “How much snow is normal for (my location) in a year?” The answer usually contains one of two words: “average” or “mean.” Average and Mean are synonymous. However, there is another statistical term which you may not hear too often, but it may actually better describe the annual amount of snow which occurs in any season. This term is the “Median.”

First, in statistical terms, the Mean is the “average” of a set of numbers. As a “norm,” the NWS uses the Mean to describe the normal condition. When the NWS says, “The average snowfall for the season is 59 inches,” – the “59” is the Mean.

(cont. p. 4)

Tale of Two Summers cont.

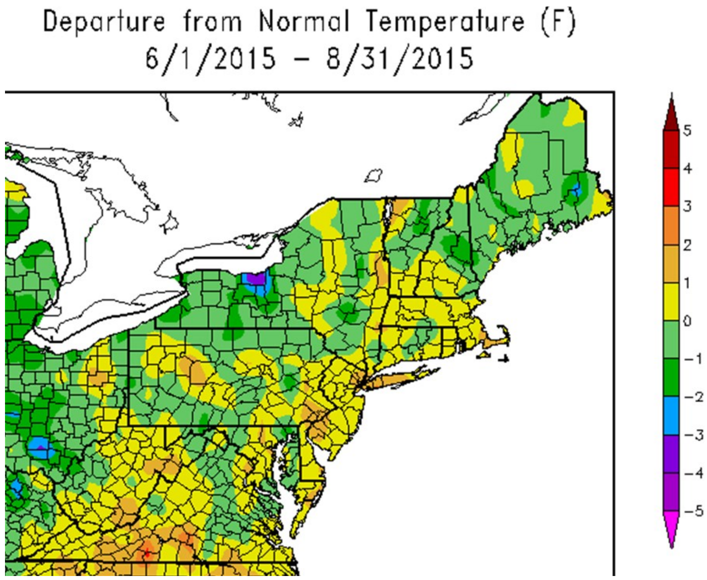


Figure 2. Summer Temperature Departures

Another measure of how "extreme" a summer was involves looking at the number of days it hit 90 or above at a given site. Table 1 shows that except for our higher elevation locations, the number of 90 degree days was well below normal. So even in the areas of the map where temperatures were above normal, the actual number of "hot" days was limited.

El Nino

Much has been said of the developing El Nino and what it will mean for the upcoming cool season. Well let's first say that one of the most reliable signals a strong El Nino sends is for the Atlantic Tropical season to be quieter than normal. In a normal season we usually have around 11 named tropical cyclones with around 6 becoming hurricanes. This says nothing about how many will hit land or be strong or both, it is just the number of storms expected to form in the Atlantic basin in a given year. The expectations are that this season which technically runs through the end of November will only have about 8-10 named storms with just 2-4 hurricanes.

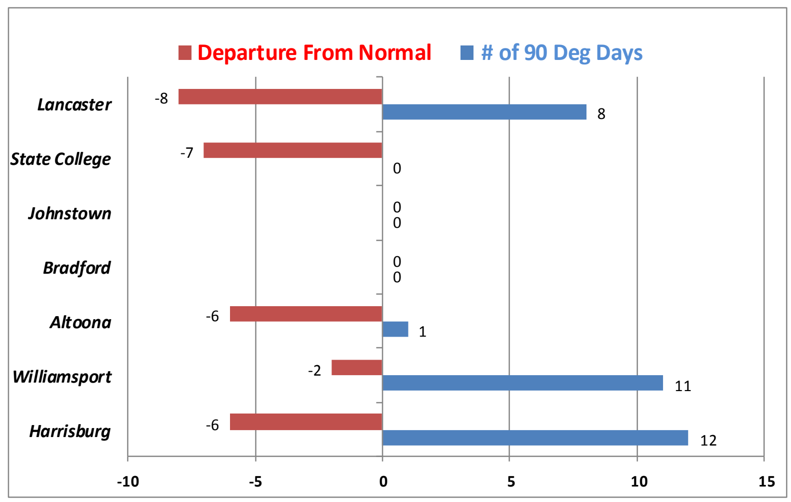


Table 1. Number of 90 Deg Days and Departure

That's not a reason to ignore the tropics altogether, we are reminded that Category 5 Hurricane Andrew devastated south Florida in 1992, an El Nino year!

But what does the El Nino mean for the upcoming winter?

(cont. p. 4)

How Deep of a Precipitation Hole is California in?

John La Corte—Senior Forecaster

Heat, drought, raging wild fires and even the ground sinking as waters tables are depleted; the news out of California just seems to get worse and worse as the multi-year drought grinds on and on, but is the end in sight? The short answer is probably not, but some relief may be on the way.

As a developing El Nino signals that the waters of the equatorial Pacific are beginning to simmer, many on the west coast hope that the anomalously warm ocean can help deliver a bountiful rainy season to the region, the kind that has been associated with the phenomena in the past. Setting aside that floods and mud slides tend to also be associated with heavy rains in the region, the heavy rain storms of the winter are counted on to replenish reservoirs, recharge ground water levels and pack the mountains with snow which supplies water from snow-melt in the summer season. But how much rain will the west coast need to alleviate the drought? The answer is **A LOT**! The most recent data indicate that California is running a 5 year rain deficit of 8 inches in the dry southeast to almost 50 inches along the north coast. Four year rainfall amounts (2011-2014) have been between 54-75% of normal during that time frame. To put the deficits into another perspective, every region in California is missing at least a year's worth of precipitation. In fact, the south coast of California Is missing almost two year's worth of rain (1.82 years to be exact).

The amount of rain needed to erase long term deficits is almost unbelievable in some areas, record breaking in fact. For example, in the San Joaquin Valley would have to break the record for their previous wettest year by 18 inches! (cont. p. 3)

California Drought cont.

Figure 1 shows how much precipitation is need in California to obtain some measure of drought relief. When speaking about past California droughts, state climatologist Mike Anderson wrote that in order to replenish reservoirs, ground water levels and snow packs, they need precipitation on the order of 150% of normal. Whether or not El Nino can deliver remains to be seen.

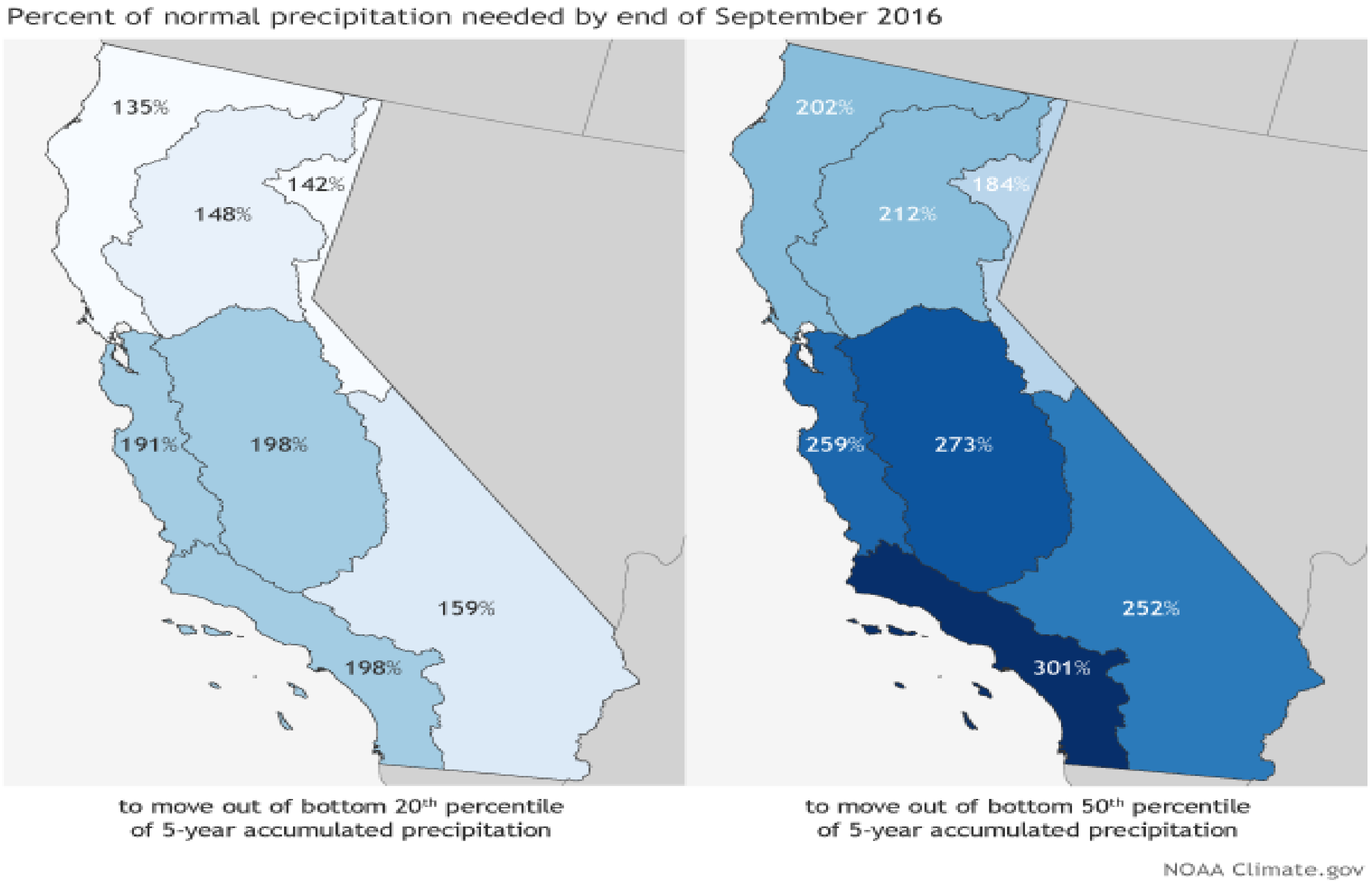


Figure 1. Percent of normal precipitation required in the upcoming water year (October 1, 2015-September 30, 2016) in order to mitigate 5-year rainfall deficits. (**left**) Precipitation needed to emerge from the "bottom bracket"—the 20th percentile, or lowest 20% of values, for all 5-year periods in the historical record. (**right**) Precipitation needed to be restored to the middle of the historical pack (50th percentile). Maps by NOAA Climate.gov, based on analysis of Climate Division data by Rich Tinker, NOAA Climate Prediction Center.

Another phenomena that gets less attention in the media is how the earth literally sinks or rises in response to reservoirs and lakes drying up or the ground water levels being depleted. Areas where ground water has dried up have reported ground levels sinking between 1 and 2 feet per year on average. Measurements of the ground rising up after surface water evaporated or was used up were less drastic, but any way you look at it the effects of the drought are varied and almost all bad.

Information for this topic came from the following sources:

https://www.climate.gov/news-features/event-tracker/how-deep-precipitation-hole-california

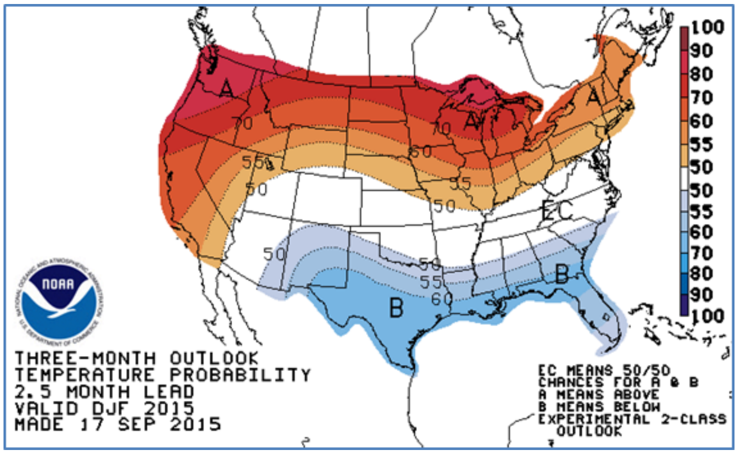
http://www.smithsonianmag.com/science-nature/californias-record-drought-making-earths-surface-rise-180952429/?no-ist

http://la.curbed.com/archives/2015/06/huge_sections_of_california_are_sinking_because_of_the_drought.php

https://www.revealnews.org/article/california-is-sinking-and-its-getting-worse/

Tale of Two Summers cont.

This year's El Nino is already strong and expected to become stronger. The seasonal forecast issued by the Climate Prediction Center (CPC) shows much of the northern tier of the US including the local area to favor being warmer than normal (Fig 3a) while being right on the gradient between above normal precipitation from the southeastern states up into southern New England and drier than normal conditions centered over the Great Lakes (Fig 3b).



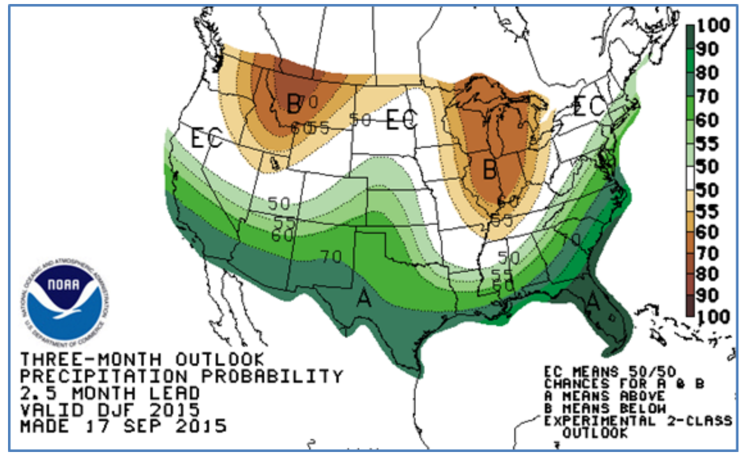


Figure 3a (left) Forecast Winter Temperature Departure From Normal.

Figure 3b (right) Forecast Winter precipitation Departure From Normal.

But what about snowfall? Warmer than normal temperatures with the expectations of being wetter than normal over the southeastern part of the state, could this mean more rain storms than usual? The CPC has seasonal composites for typical El Nino winters and while it may be a little hard to read in Figure 4, the expected area of above normal snowfall (in blue) pretty much mimics the band of above normal precipitation expected along the coastal plain from the Carolinas to New England.

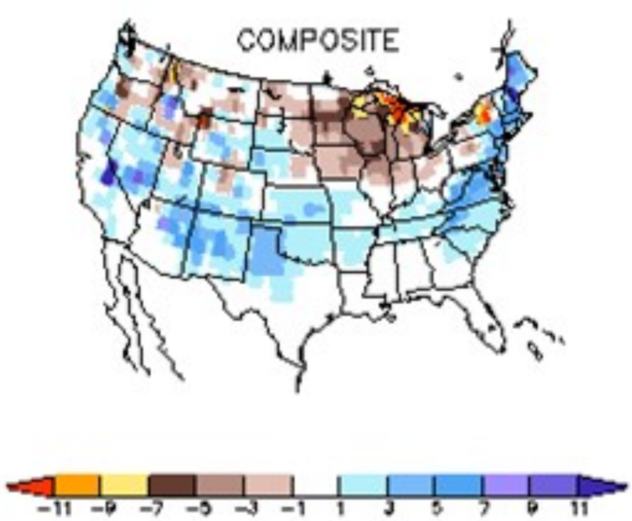
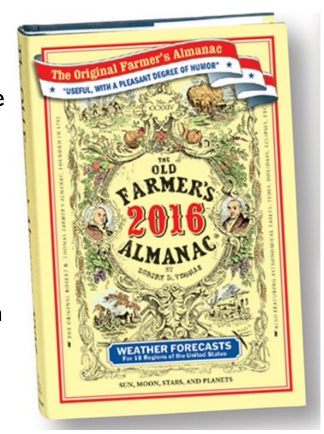


Figure 4. CPC Forecast Winter Snowfall Departure in an El Nino Win-

In keeping with the custom, we consulted the Old Farmer's Almanac for their winter forecast, and the old farmer calls for yet another colder than normal winter over all but the southeast part of the region where temperatures are expected to be closer to normal. Snowfall in the colder than normal areas is expected to be near average while below normal snowfall is called for over southeastern areas.



As usual we'll see you in the Spring for a wrap-up. I think most would agree with me in at least hoping the upcoming winter is not nearly as cold as the last two.

Snow cont.

Figure 1 on page 5 shows the Mean Annual Snowfall. Compare your snowfall with the folks in the "Snow Belt" downwind of Lake Erie. Many of them receive more than 110 inches of snow in a typical winter season. Some locations in and near Philadelphia receive less than 20 inches.

However, another statistical way to look at the data is the Median. The Median value is the middle value of the entire dataset. If your dataset consists of: 2, 7 and 8, the Median value is 7. Sometimes, especially in varying data sets with large spikes or dips (outlying values), the Median value may be more representative of the normal, but not in all cases.

The variability in snowfall from one season to the next can swing widely (or is that wildly?) for most locations in Central PA. Figure 2 on page 5 is a great example of how the Mean and Median could be quite different, and may result in quite a different "normal." This chart is the actual observed seasonal snowfall in Harrisburg since 1980-81. (cont. p. 5)

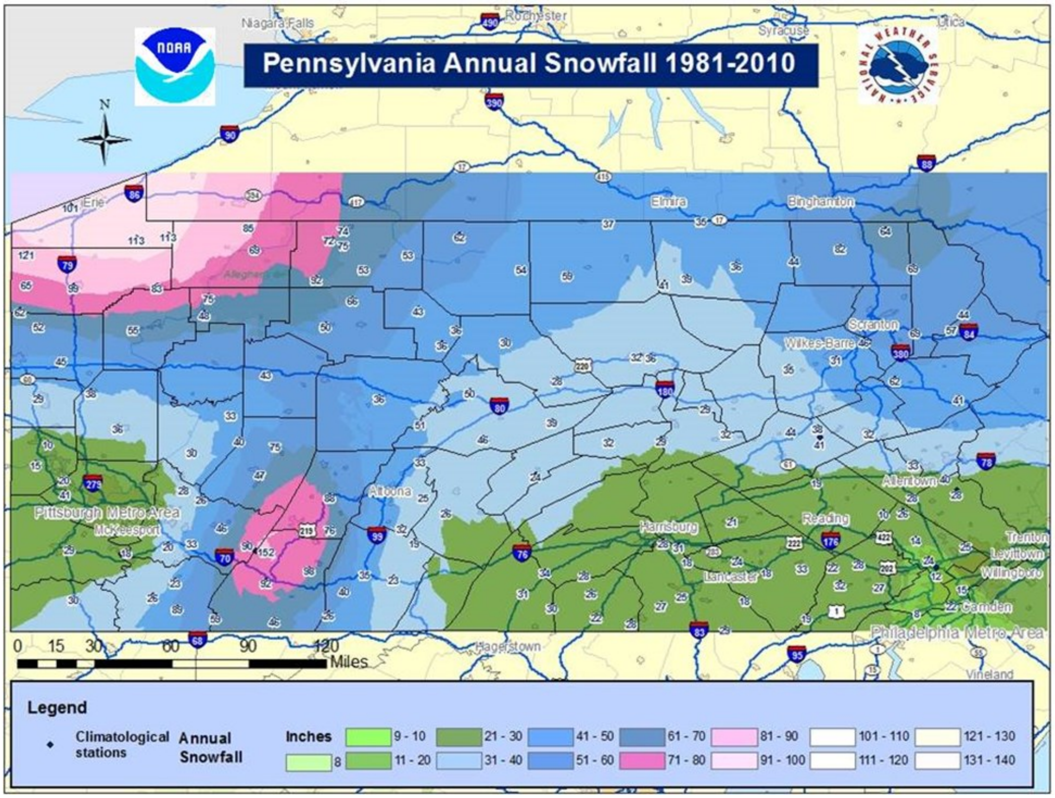


Figure 1. Regional Snowfall Averages

As you can see, the year-to-year variations can be as drastic as the great difference between the seasons in the mid -1990s. Sandwiched in between the dual 75+ inch seasons of '93-'94 and '95 -'96 is one season (the record lowest in Harrisburg) of only 9 inches.

In the case of Harrisburg, the Median value of 25.1 inches is significantly lower than the Mean of 30.6 inches - 20 percent lower! This occurrence of the Mean snowfall being higher than the Median can almost be expected, since it is the very SNOWY seasons which are the outliers. A majority of the seasons have a value ranging between 10 and 35 inches. Even if you change a couple of seasons in this dataset to zero snowfall, the Mean will struggle to get down to the Median because there are quite a few high outliers (it's a statistical thing).

(cont. p6)

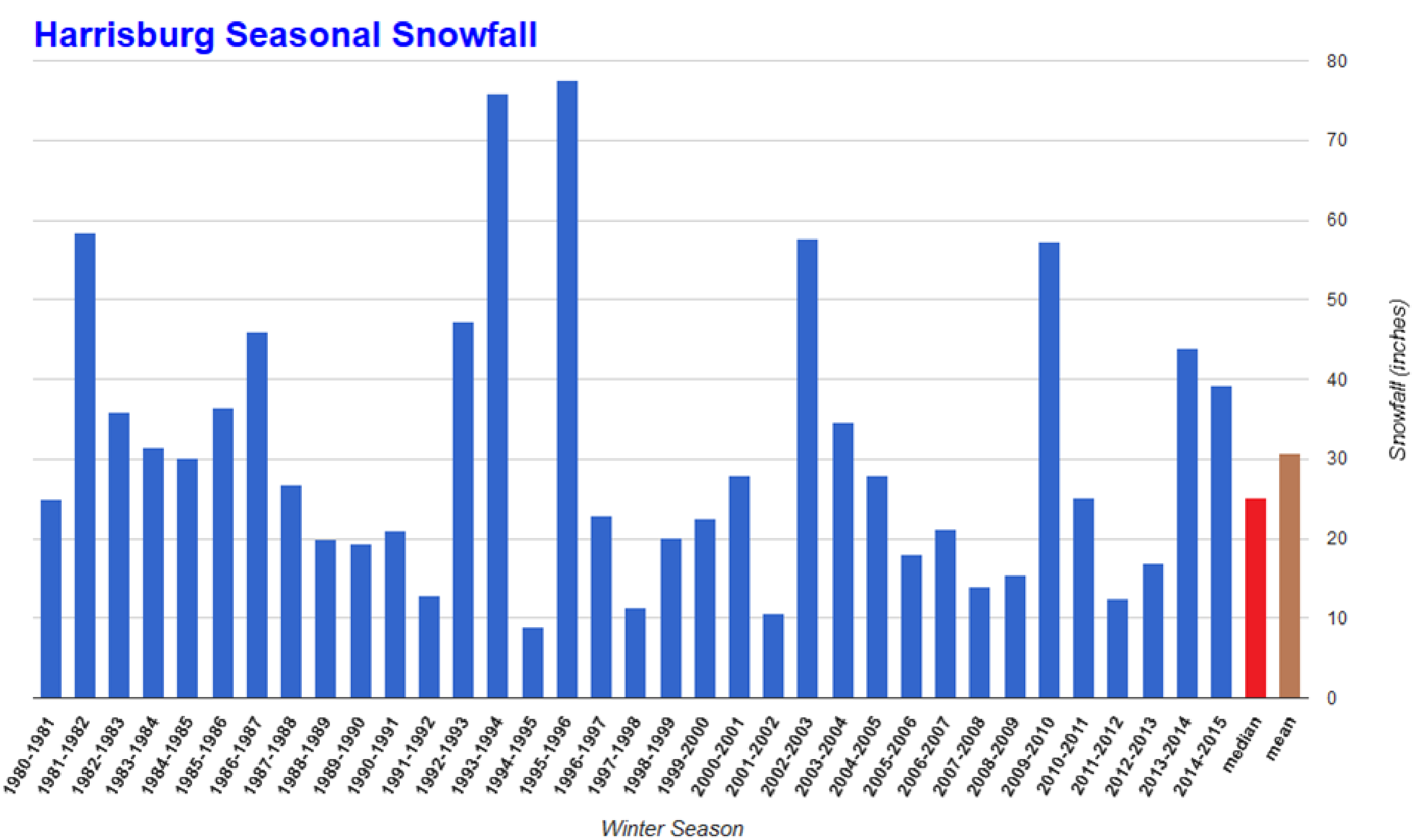


Figure 2. Observed Harrisburg Winter Snowfall

Snow cont.

So, for Harrisburg, it may be possible that the Median may not best describe the "normal" snowfall.

However, in the case of the Laurel Summit Co-Operative observation site (the second chart), we see a different picture. The Median Snowfall (168.3") is very close to, but slightly higher than, the Mean (164.2"). Why is this? The answer lies in the data.

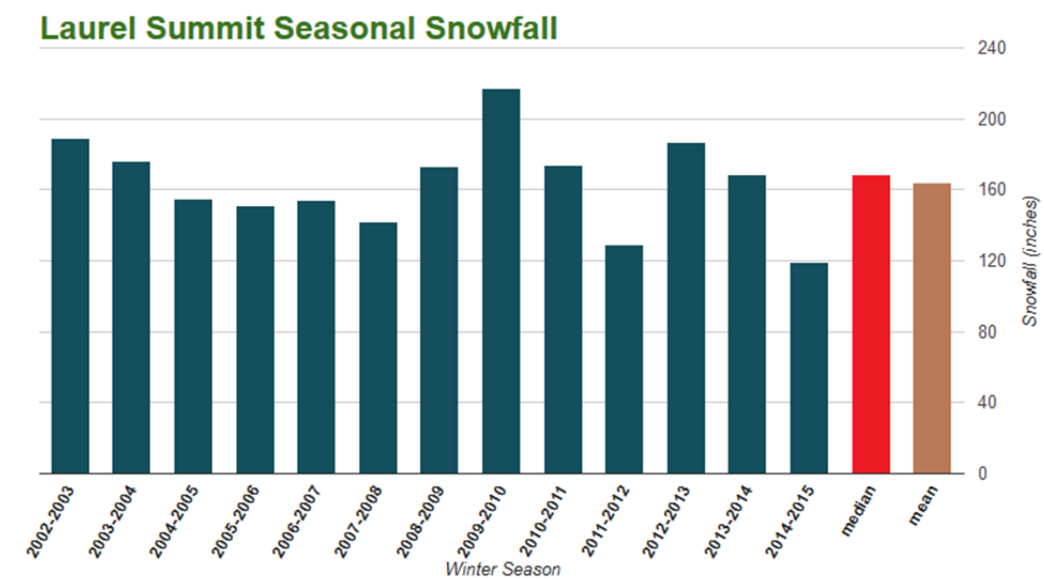


Figure 3. Observed Snowfall for Laurel Summit

Laurel Summit (Fig 3) received no less than 118.9 inches in any one season since 2002-03. The outlier on the high end is the 217" snowfall in the 2009-10 season. Since the distribution of values is fairly even, the Mean and Median are very close (some would say the difference is "statistically insignificant"). Therefore, either the Mean or the Median should be an accurate representation of the normal snowfall at Laurel Summit.

The lesson is to always choose your words very carefully, especially when it comes to statistics.

Hurricane Joaquin

John La Corte—Senior Forecaster

As was noted in a previous article, with a strong El Nino starting to simmer in the Tropical Pacific, one of the most reliable signals we have come to recognize is that the hurricane season in the tropical Atlantic is almost always quieter than normal. So far in 2015 that indeed has been the case. But another thing we noted is that the overall activity doesn't necessarily mean that a severe hurricane will not form and have a negative impact. And this year we had Joaquin.

Joaquin began as a depression (tropical cyclone with winds between 20 and 34 knots, or about 23-39 mph) northeast of the Bahamas late on September 27th. The storm meandered about, eventually drifting off to the southwest where it wandered slowly between Rum Cay and Crooked Island in the Bahamas. It was on this slow drift off to the southwest that the storm intensified quickly and by mid day on October 1st, Joaquin had become a dangerous category 4 hurricane with peak winds of 130mph.

It was then the forecast for the eastern United States became very interesting to say the least. At the same time as Joaquin was wandering about the Bahamas, a very strong upper storm was developing over the lower Mississippi Valley. This upper storm threatened to steer Joaquin toward the eastern seaboard, and for a couple of days the National Hurricane Center forecast it to do just that, indicating a landfall somewhere between the Carolinas and New Jersey. But as time wore on, it became apparent that Joaquin would remain just out of reach of this upper level storm's influence and it eventually tracked well offshore, passing about 100 miles west of Bermuda (Figure 1. page 7).

Joaquin would still prove deadly despite avoiding the east coast of the US. As it slowly churned about the waters of the Bahamas, the 790 foot cargo ship El Fargo would fall victim to the intense storm. The ship on a course to Puerto Rico from Florida, reported they lost power on October 1st and it was taking on water. By then Joaquin was a Cat 4 storm and it appears the vessel couldn't survive the storm and sunk in more than 17,000 feet of water, leaving no survivors among the crew of 33.

Weather headlines were not done being written however. The intense upper storm mentioned earlier was destined to cause problems even without the added emphasis of Hurricane Joaquin (cont. p. 6)

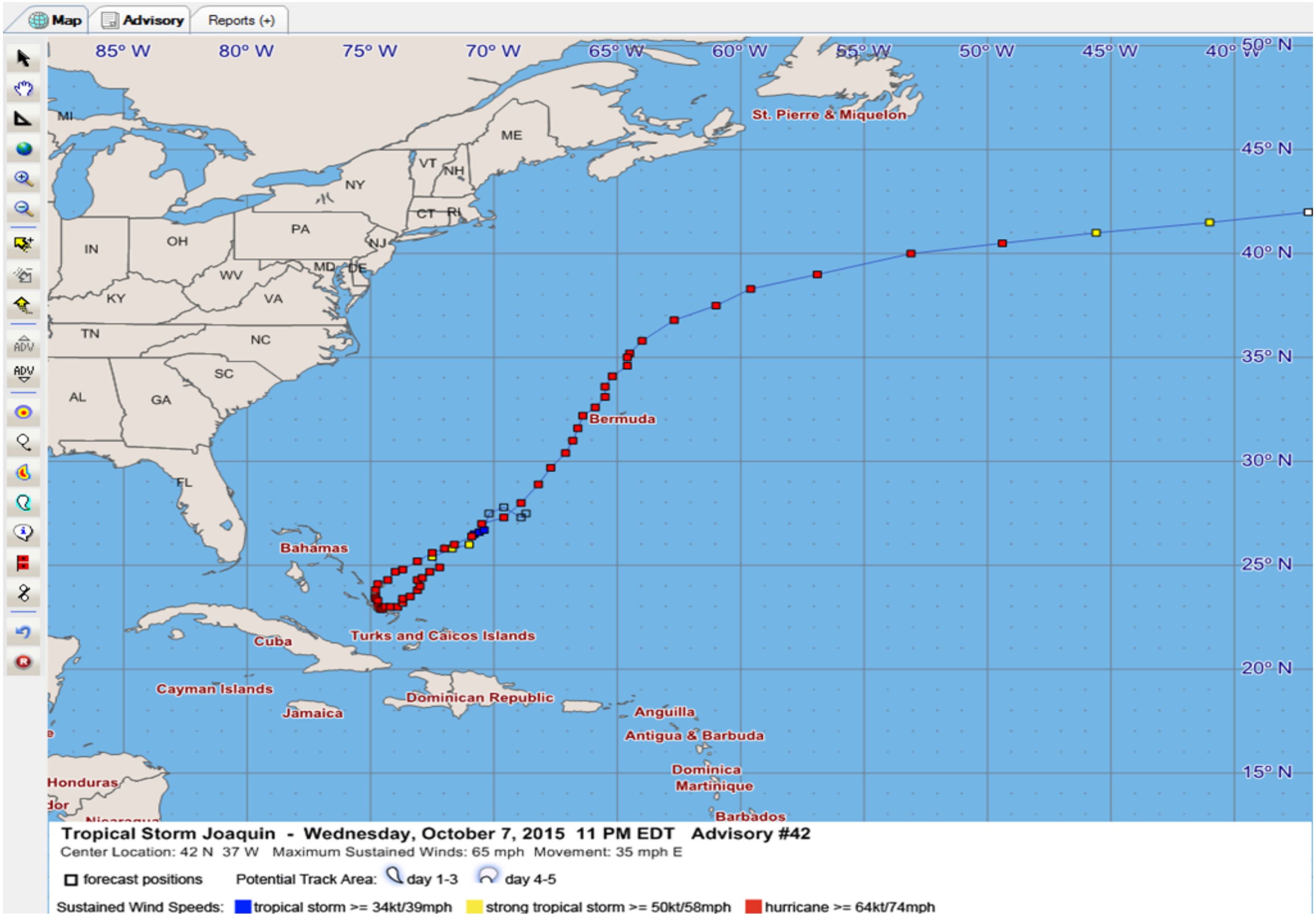


Figure 1. Track of Hurricane Joaquin

The upper storm caused a flow of tropical moisture to develop and pour up into the southeastern US, focused mainly over South Carolina. The intense moist onshore flow being pushed up into the gradually increasing terrain stayed nearly stationary for more than 2 days contributing to the incredible rainfall amounts, around 2 feet in some places! Myrtle Beach officially measured 24.45 inches of rain, about what we receive over a seven month stretch in a typical year here in central Pennsylvania. Figure 2 shows how South Carolina bore the brunt of this record rain which not surprisingly led to record flooding as well. As of this writing more than 20 fatalities are being attributed to the flood waters.

So despite El Nino encouraging below normal activity in the Atlantic basin, extreme weather can and does happen during these "slow" years, both directly and indirectly.

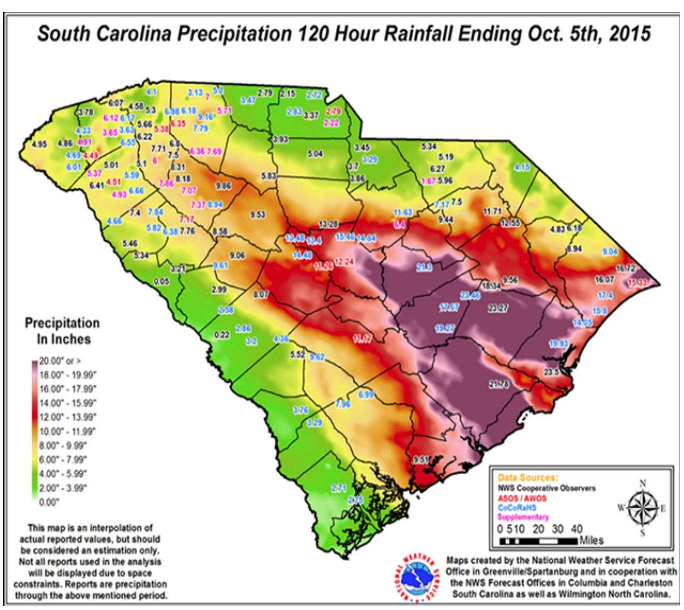
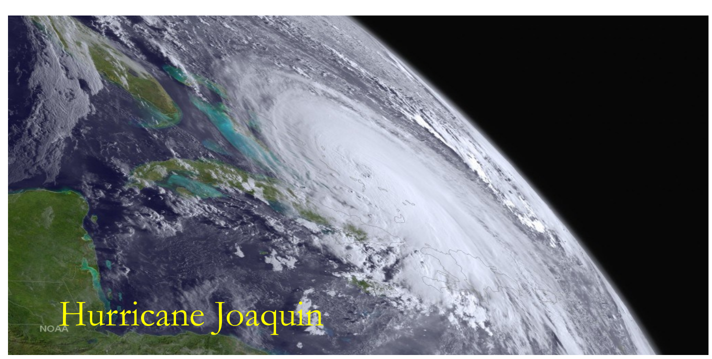


Figure 2. Five day rain totals for South Carolina



Monarch Butterflies

Dave Martin—General Forecaster

In recent years we have seen reports of beneficial insects and animals experiencing a decline in numbers due to a variety of causes. Bees have suffered "colony collapse" causing farmers to look for alternative means to pollinate crops. Entire bat colonies have disappeared, removing a very important natural control of native mosquito populations. Another insect that may not technically be as beneficial as bats or bees, but could be considered one of the most majestic members of the insect family, is the Monarch butterfly.

As it turns out, the number of Monarchs has also been on the decline in recent years. Several factors may be to blame with weather and pesticides seeming to be the two largest culprits. A warming globe is shifting natural habitats, and the widespread use of potent pesticides effectively controls the weeds that are a main source of food.

Each year several generations of Monarchs are born. The butterflies start off as caterpillars and the main source of food for these caterpillars is the Milkweed plant. The cycle starts in March and April as the butterflies start their annual migration north from Mexico to the United States and Canada. Some will lay eggs along the way, and after about 4 days the baby caterpillars emerge. They spend about 2 weeks eating before attaching themselves to the leaves and stems of the Milkweed plants. There they transform into a chrysalis and about 10 days later they emerge as butterflies before continuing their journeys, feeding on Milkweed along their way. The cycle repeats several times throughout the summer into fall.

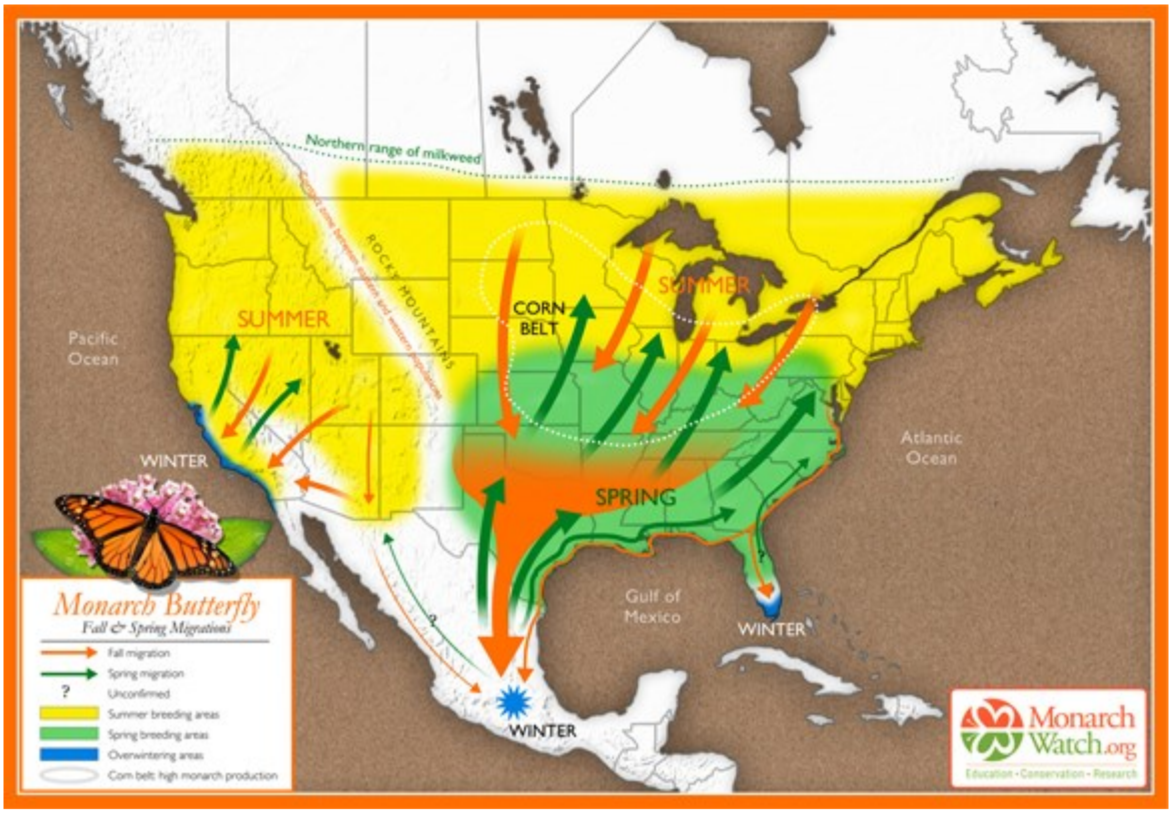
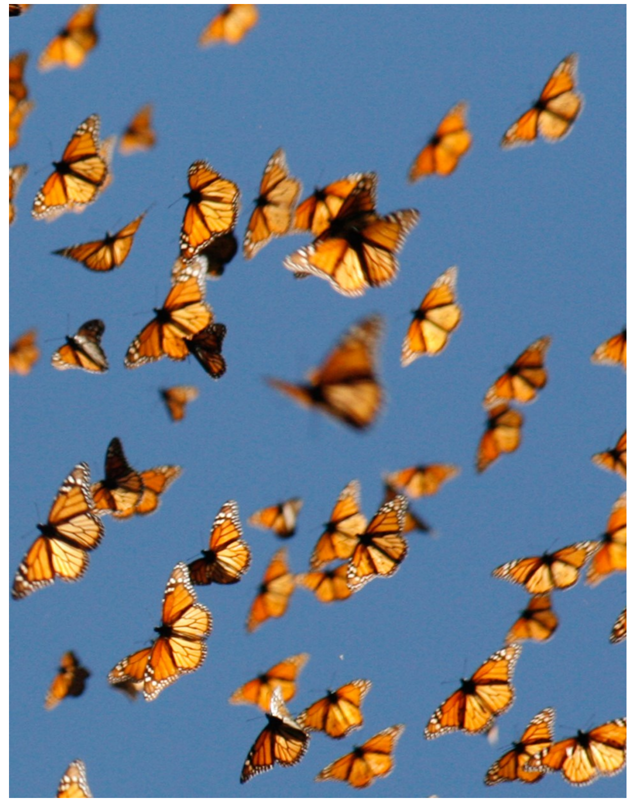


Figure 1. Monarch Butterflies migration routes

The butterflies born in September and October will tend to live the longest. Like earlier generations, these butterflies are on the move. The difference is these will fly all the way back to Mexico or southern California for the winter (Figure 1) Instinctively these butterflies know exactly how, when and where to migrate. Butterflies across western North America migrate to the coast of southern California. Butterflies over central and eastern North America migrate to the Sierra Madre Mountains of central Mexico. It has been observed that the butterflies often follow the I-35 corridor down through Texas for their migration with between 60 million and 1 billion butterflies making the trip to Mexico. These creatures can travel as much as 80 miles a day, an amazing task considering they are only about 4 inches long. At this rate, the trip to Mexico can take upwards of 2 months.

There are only about a dozen sites in central Mexico where the butterflies can spend the winter. The Monarch Butterfly Biosphere Reserve in central Mexico is the main area for their seasonal stay. The hibernating butterflies huddle together on trees to fight off the cold nights and rain. The Oyamel tree seems to be a favorite and it's not unusual for some trees to actually snap under the weight of the butterflies. They remain in the treetops until early spring when the cycle back north starts once again.

In recent years the number of butterflies has been on the decrease. Part of the problem has been abnormally cold winter temperatures in Mexico in recent years. The population can handle some normal year to year variation, but several consecutive abnormally cold winters have taken a negative toll. For example, rainfall and freezing temperatures can affect Milkweed growth. Conversely temperatures above 95 degrees can be lethal for larvae with hot and dry conditions causing a major decrease in the hatch rate. (cont. p. 9)



Last year (2014) the number of Monarchs that migrated to Mexico was the lowest on record. The butterflies covered just .67 hectares of forest (a little over 1.6 acres). This is down from 21 hectares (more than 50 acres) during the 1996-1997 season.

The number of Monarch butterflies has been decreasing for the last 20 years with a decrease of 50 percent of the number that overwinter in California, and a 90 percent decrease in the number that stay in Mexico.

However the bigger problem has been the move to grow more corn for energy production. This is especially the case across the Midwest as more land is used for crops, and pesticides such as glyphosate (main ingredient in Roundup) are used to control weeds between crop rows. It is estimated that somewhere between 102-150 million acres of what once was Milkweed habitat is nearly gone now. Milkweed is a perennial plant which is necessary for the butterfly's survival. Aside from the nectar that the butterflies eat, they will only lay eggs in the Milkweed plants.

One way to possibly help is by not destroying Milkweed plants or even planting some locally. However research indicates that planting Tropical Milkweed can actually have a negative effect. Tropical Milkweed may encourage the butterflies to not to migrate south in the winter. Also this type of Milkweed can increase the risk that the butterflies will develop a parasitic infection. Milkweed hosts a protozoan parasite called Ophryocystis Elektroscirrha (OE). Migration and seasonal die off of the Millkweed are vital in keeping OE under control in the North America Monarch population.

Migrating butterflies offer a natural control making it harder to pass the parasite along to their offspring. Also, normal Milkweed dies off during the winter and comes back up in spring. Tropical Milkweed is not as likely to die off in the southern states. This encourages the butterflies to remain all winter and for the potential OE infection to remain and spread. Most of the Tropical Milkweed is in gardens across the south. OE and the destructive winter-breeding trend can be controlled by replacing the Tropical Milkweed with native Milkweed species or at least cutting the Tropical Milkweed plant back every few weeks during the winter.

Aside from the tropical Milkweed, other plants such as the Black Swallow-Wort and Pale Swallow-Wort plants are problematic for Monarchs. They lay their eggs on these relatives of native vining Milkweed plants because they produce stimuli similar to Milkweed. Once the eggs hatch, the caterpillars are poisoned by the toxicity of these invasive plants from Europe.

As if there were not enough barriers to the survival of these beautiful creatures, another problem having a negative influence is the illegal logging of Oyamel trees that has been occurring in Mexico in recent years. The Oyamel is a major species of evergreen which the butterflies prefer to spend most of the winter in.

Hopefully as we learn more, we can help one the most beautiful insects around recover in number and continue to delight butterfly fans well into the future.

4th anniversary of Tropical Storm Lee

Shane Kearns —Student Intern

It has been over 4 years since Tropical Storm Lee devastated portions of Pennsylvania. We took a look back at the extreme flooding that occurred during the first week of September 2011, which caused over $2 billion worth of damages.

Formation and Rainfall

Nearly saturated ground provided the antecedent conditions for the flooding from the remnants of Tropical Storm Lee. Pennsylvania had already received heavy rains during the month of August, and most areas were above average for the month. Then, during the final week of August, Hurricane Irene brought additional heavy rain and flooding to central and eastern Pennsylvania, where some locations saw up to 6 inches. In this almost saturated condition, the rainfall associated with Lee couldn't be absorbed into the soil, providing efficient "run off" (water that flows directly into streams and rivers) which caused rapidly rising streams that quickly threatened people and property.

Tropical Storm Lee formed in the Gulf of Mexico on September 2nd a few hundred miles off the coast of Louisiana. On September 3rd, Lee reached its maximum intensity of 60 mph and began to merge with a nearby upper level low. At this point Lee began to transition into a subtropical storm and made landfall early on September 4th over southern Louisiana. Lee remained nearly stationary over Louisiana for a day or so before it was picked up by a strong cold front and began moving north.

Precipitation from this cold front began affecting central Pennsylvania on September 4th, and proceeded to stall over the region for the next 48 hours. 2-4 inches of rain fell September 4th and 5th over most of Pennsylvania from the stalled front. On September 6th, the west-east orientated frontal rain bands declined. These were replaced by south to north orientated rain bands associated with the remains of Tropical Storm Lee, which had tracked into the southern Appalachians by this time. Lee's location enabled an anomalously strong southerly flow to form over Virginia and Pennsylvania, transporting Gulf of Mexico moisture northward. This flow combined with the lifting over the northern Chesapeake Bay due to the stalled frontal boundary and set the stage for extreme rainfall to take place. An additional 2-5 inches fell on September 6th across a large area of central Pennsylvania. On September 7th the rain bands became more isolated and trained over the same areas leading to 6-9 inches of rain falling over parts of the Susquehanna Valley. The rain finally trailed off on September 8th as the front and the remnants of Lee moved across the Delmarva and out over the Atlantic Ocean. Precipitation totals from September 4th to the 8th over the Susquehanna Valley topped 10 inches in many locations, with a large swath of central Pennsylvania receiving over 6 inches.

Flooding

Rivers and streams began to overflow their banks on September 6th. The flooding quickly moved from minor to life threatening. Many small streams quickly rose to near record levels and major rivers were soon to follow.

The Swatara creek, which flows into the Susquehanna and passes through Hershey, experienced some of the most dramatic flooding of the event. From September 5th to the 8th, Hershey received 12.18 inches of rain from the remnants of Tropical Storm Lee, including 6.98 inches on the 7th. Minor flooding began the morning of September 7th when the Swatara Creek began to overflow. The creek reached moderate flood stage by the afternoon and quickly jumped to major flood stage within 3 hours. At this point numerous homes adjacent to the creek were affected by flood water, and Route 39 began to go under water. The Swatara creek broke its record stage of 16.12 feet a few hours after this, and kept rising. It crested at 26.80 feet (over 10 feet above its previous record stage!) around 24 hours later in the evening on September 8th. Areas in and around Hershey Park were under several feet of water. Many area roads were impassable due to flooding, and numerous homes and businesses were flooded.

The Loyalsock Creek flows into the West Branch of the Susquehanna River in Lycoming County, passing through Loyalsockville on its way. Loyalsockville received 9.70 inches of rain between September 4th and 8th including 5.09 inches on the 7th. The creek quickly responded to this heavy rainfall, rising almost 15 feet in just over 12 hours on its way to breaking its record stage (the exact crest stage is unknown because the gage stopped reporting). Major flooding occurred along the creek in Montoursville where many properties were inundated. North of town, in Loyalsockville, the PA 973 bridge over the creek was washed out, while the Green Bridge and nearby railroad bridge were damaged, but survived. Further upstream at World's End State Park, the creek destroyed a bridge that led to the campground. Campers were evacuated from the area before significant flooding isolated the area. Parts of PA 154, the only major travel route, were underwater and suffered structural damage. (cont. p. 11)

Lee cont.

The Susquehanna River flows over 444 miles on its way through central Pennsylvania to the Chesapeake Bay, and passes through the cities of Bloomsburg and Harrisburg (among others). In Bloomsburg, Fishing Creek flows just north and west of town on its way to the Susquehanna River. The creek quickly overflowed its banks, and began to flood roads in town. The flooding intensified on the 8th, when roads turned to rivers, and people began to evacuate their flooded homes. The Fernville Bridge over Fishing Creek was partially underwater at this point and turned out to be heavily damaged. The Bloomsburg Fair Grounds were overrun by the flood waters, as was over a quarter of the town of Bloomsburg. The Susquehanna River crested at its second highest level on record in Bloomsburg at 32.75 feet. In Harrisburg, river flooding began on the 8th. It reached its peak on the 9th, completely submerging some areas such as the Shipoke neighborhood and City Island. Many waterfront properties became flooded to their second story in Harrisburg, and across the river in New Cumberland.

Aftermath

In Pennsylvania, the flooding from Lee rivaled Agnes in terms of magnitude and scope. Some of the hardest hit areas will remember Lee for producing record flooding, as well as flooding places that didn't flood during Agnes. The preceding heavy rain from the cold front and Hurricane Irene also played an important role in the severity of the flood. The combination of heavy rainfall and the nearly saturated ground led many creeks to quickly rise over a short period of time. Residents were unprepared for the rapidly rising water, and had to make fast decisions to ensure their safety. After the storm, communities came together to clean up, rebuild, and prepare for the next flood.

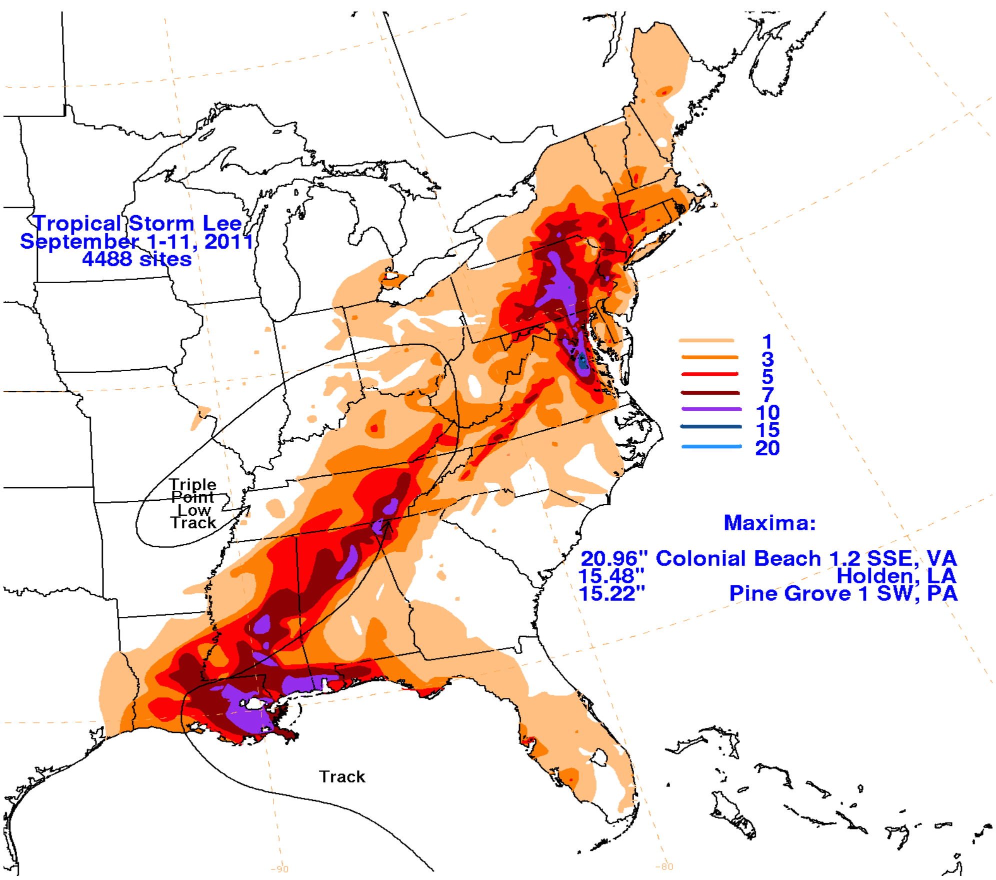
For more information about the flooding in Central Pennsylvania during Tropical Storm Lee, please visit: http://www.weather.gov/ctp/TSLeeFlooding

Flooding on Rt. 39 in Hershey leading to the Giant Center. Image courtesy of Sean Simmers, The Patriot News.

The washed out PA 973 bridge over Loyalsock Creek near Loyalsockville. Image courtesy PA State Police.

Flooding in downtown Bloomsburg. Image courtesy of BloomUtoday.com

Flooding in the Shipoke neighborhood bordering the Susquehanna. Image courtesy Sean Simmers, The Patriot News.



Tropical Storm Lee - September 1-11, 2011 (http://www.wpc.ncep.noaa.gov/tropical/rain/lee2011.html)

Update Your Spotter Information

Bill Gartner—General Forecaster

Please help us to keep your contact information current. While we hope to get a report from you when severe weather occurs, from time to time we call or email spotters to investigate significant storms. Thus, it is important to keep your contact information current. If any of your 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.

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

Wintertime spotter requests

Winter weather will be here soon! Your Spotter reports help us to monitor ongoing winter storms, determine the need for possible changes to advisories and warnings, and provide real-time snowfall totals to the public, news media and other partners, and other NWS offices.

Spotter reports are also used to verify our 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'd still love to hear from you when it's all over.

Please report the following:*

Snow:
- When (new) snow accumulation reaches 3 inches (2 inches in the Susquehanna Valley)
- When (new) snow accumulation reaches 6 inches (5 inches in the Susquehanna Valley)
- Storm total after the snow ends (also water equivalent if possible)
- If snow is falling at the rate of an inch per hour or greater

Ice:
- Any occurrence of or accumulation of freezing rain / drizzle
- Accumulation of ice of ¼ inch or more on trees or wires or other surfaces

Other:
- When observed winter precipitation differs significantly from the forecast (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 winter.

*This list of reporting criteria is available on our web page: http://www.weather.gov/ctp/reportSevere

Becoming a Spotter

For more information and to see the future schedule, please go to http://www.weather.gov/ctp/SpotterTalks

(cont. p. 15)

Web Based Reporting:

The ESpotter Program, a web-based reporting method for spotters to submit reports, has officially been terminated. In its place is a new web-based form to report weather. This new page is open to all, not just spotters. It can be found at: http://www.srh.noaa.gov/StormReport_new/SubmitReport.php?site=ctp

As a spotter, when filling out the form, be sure to include your Spotter Number, and indicate in the drop-down menu that you are a NWS Storm Spotter. This will allow us to identify your report as being from a trained spotter, rather than one from the general public.

As before, we encourage spotters to contact us via phone for **active** severe weather, including wind damage and tornadic activity (funnel cloud/wall cloud/tornado).

National Weather Service Warning and Advisory Criteria Changes for the 2015-16 Winter Season

Pete Jung—Warning Coordination Meteorologist

Changes to some of the criteria used to trigger National Weather Service Advisory and Warning products have been implemented for this winter season over portions of Central Pennsylvania. Please note that this article address only the changes being made for the upcoming winter season. For a complete rundown (and maps) of all NWS Warning and Advisory Criteria in Pennsylvania see http://www.weather.gov/ctp/wwaCriteria.

The first set of changes applies to areas in the Lower Susquehanna Valley. Some **snowfall** and **wind chill** criteria have been lowered in this region. Based on collaboration with neighboring National Weather Service offices, and to better serve the higher population centers, media markets and commuting areas, the following threshold trigger changes are being implemented:

For Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon, Perry and York Counties...

Winter Weather Advisory thresholds for snow have been reduced from 3 inches to 2 inches in 12 hours. (see Figure 1)

Winter Storm Warning thresholds for snow have been reduced from 6 to 5 inches in 12 hours (see Figure 2)

Winter Storm Warning thresholds for snow have been reduced from 8 to 7 inches in 24 hours (see Figure 3)

Wind Chill Advisory criteria has been reduced from -15F to -24F to -10F to -24F (see figure 4)

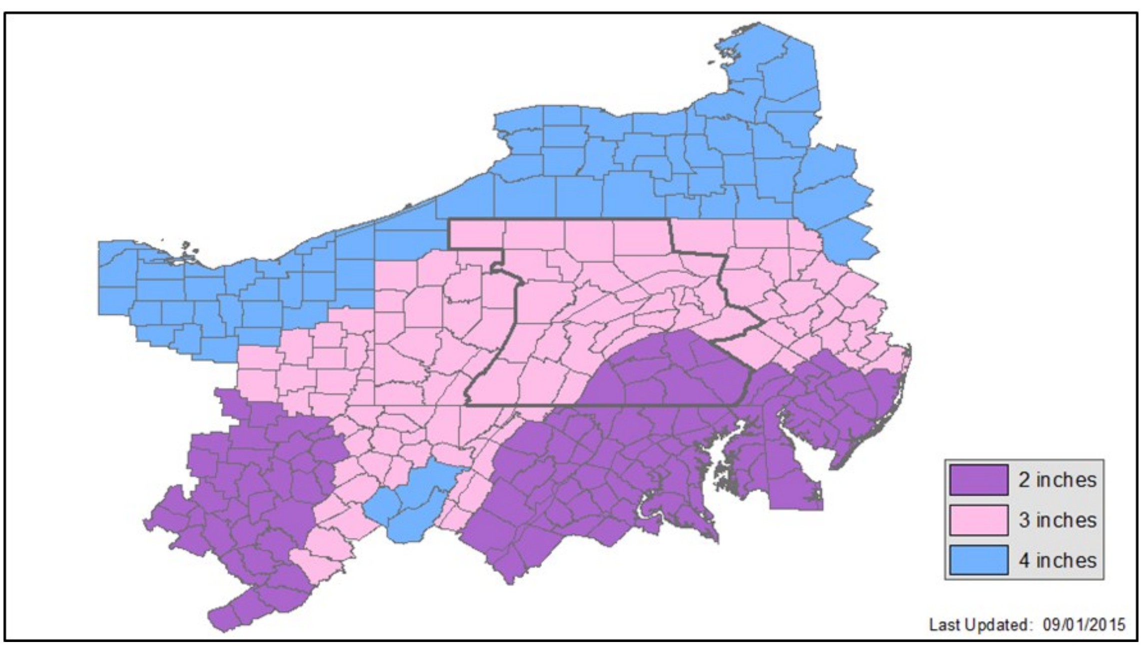


Figure 1: NWS Winter Weather Advisory Criteria - 12 hour Snowfall

(cont. p. 16)

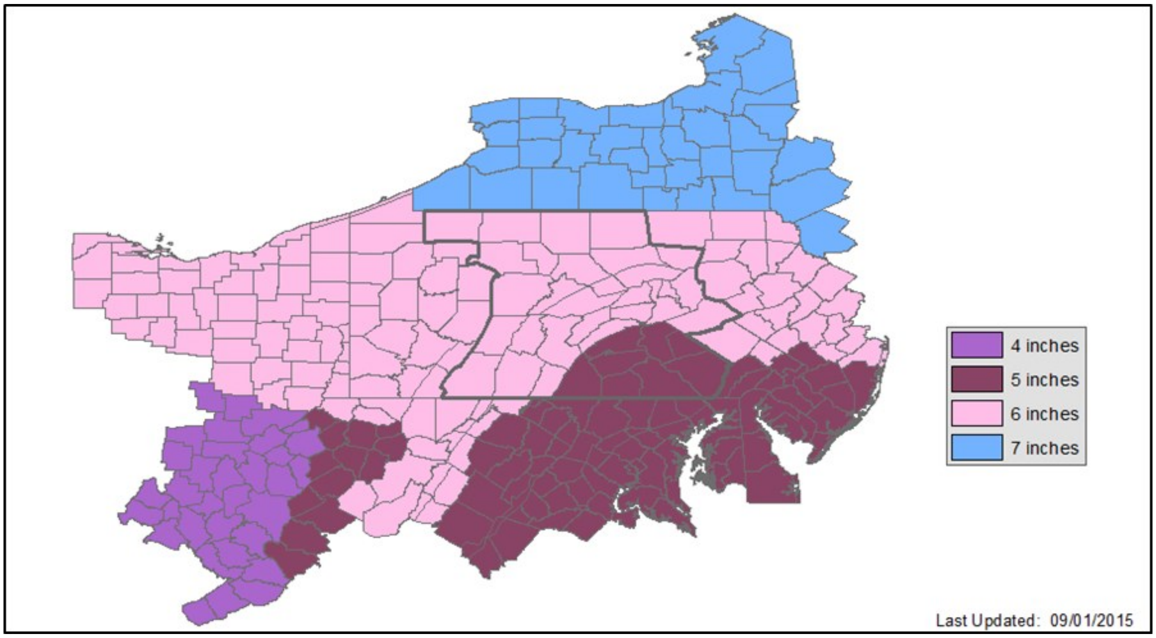


Figure 2: NWS Winter Storm Warning Criteria - 12 hour Snowfall

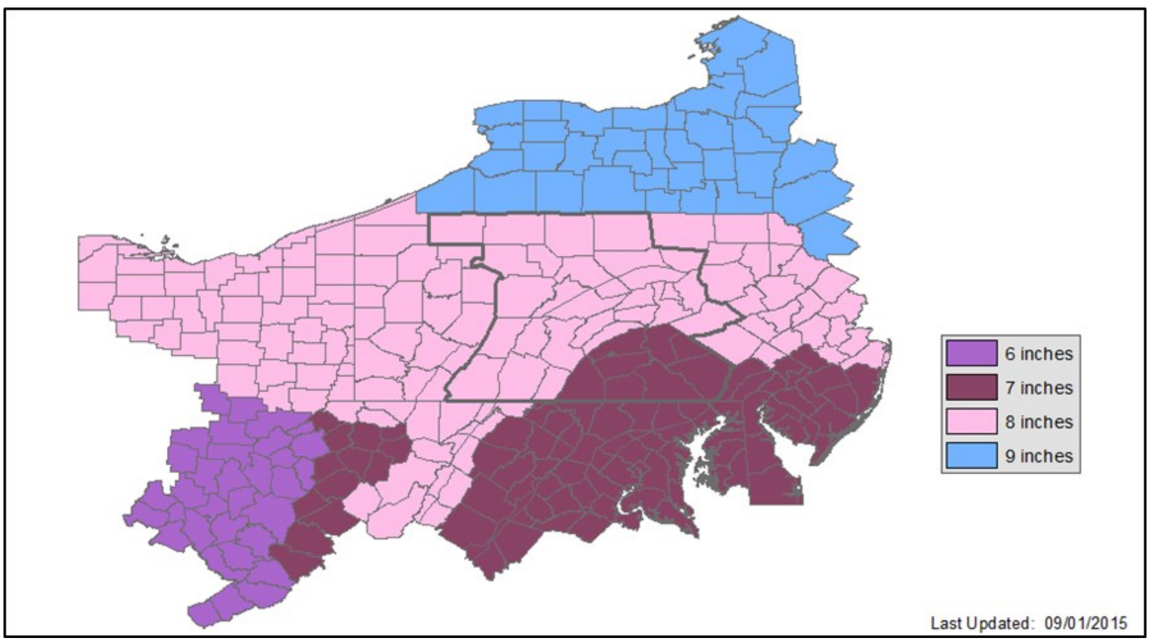


Figure 3: NWS Winter Weather Storm Warning Criteria - 24 hour Snowfall

In addition, for some northern tier counties in Central Pennsylvania, the criteria for Ice Storm Warnings have been raised. The new Ice Storm Criteria better defines warning level impacts and correlates better with loss of larger tree limbs and power lines that the former criteria. Specifically:

For Cameron, Clinton (Northern), Elk, Lycoming (Northern) McKean, Potter, Sullivan, Tioga and Warren Counties

Ice Storm Warning thresholds have been increased from ¼ inch of ice to ½ inch of ice. (see figure 5).

(cont. p. 17)

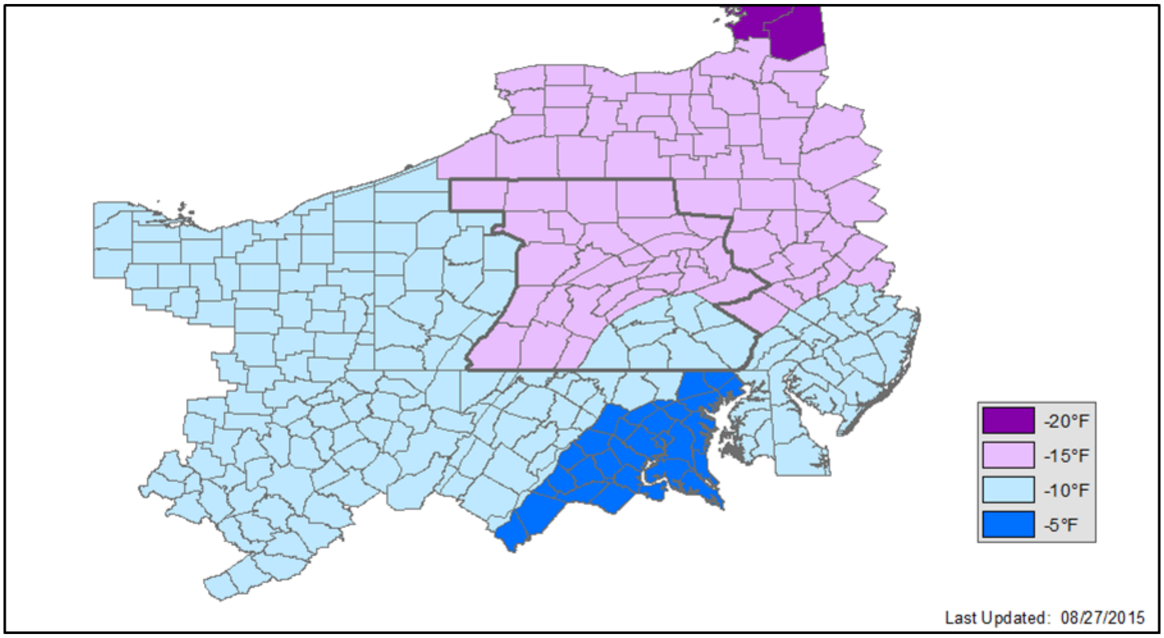


Figure 4: NWS Wind Chill Advisory Criteria (lower bound threshold)

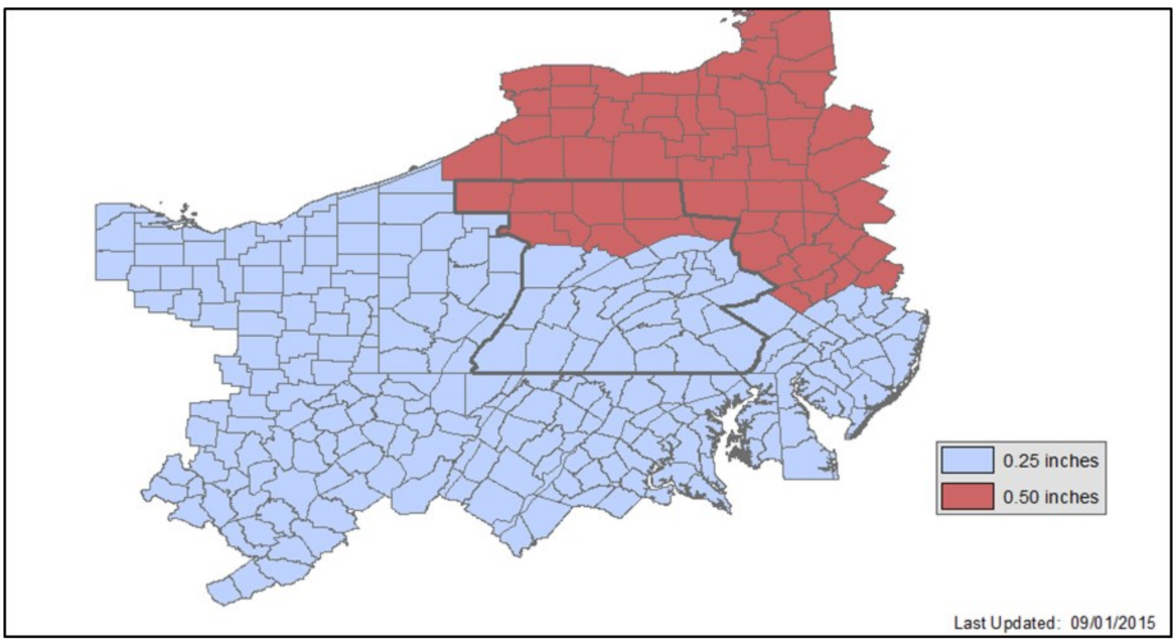
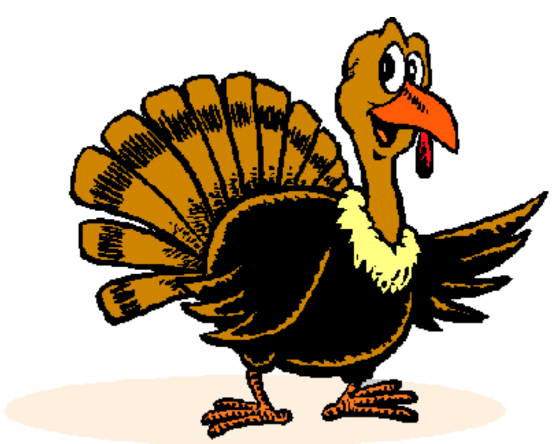


Figure 5: NWS Ice Storm Warning Criteria



Don't forget: we are on Facebook and Twitter