SKYWARNEWS

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The Winter of 2015-16 in Review

John La Corte—Lead Meteorologist

Another cold season is behind us, and after the last two severe winters, we are happy to say it wasn't really much of a cold season at all. Last Fall when the El Niño was reaching its peak in the Pacific, seasonal forecasts hinted at an elevated chance for a warmer than normal winter (here in the northeast the "signal" is considered weak). This worked out quite well with Figure 1 showing the entire eastern U.S. having experienced a warmer than normal winter, and the region from New York northward being much warmer than normal.

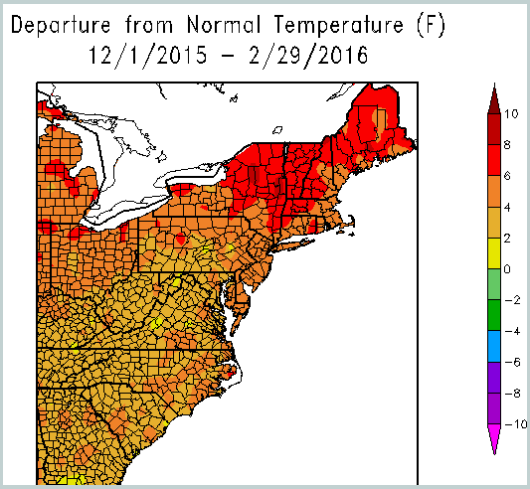


Figure 1. Winter Temperature Departure

The signal for precipitation was even weaker with a forecast of "equal chances"., which means the chances of it ending wetter, drier or near normal were the same (not very much to hang one's hat on). Figure 2 (page 2) shows that most of the eastern U.S. was wetter than normal with the region from about Georgia to southeastern Pennsylvania and New Jersey being much wetter than normal.

Another aspect of the seasonal forecast that worked out fairly well was for snowfall. Figure 3 shows what snowfall is usually like during a strong El Niño winter, and Figure 4 shows how this past season fared. At least over the Mid Atlantic and southeast Pennsylvania, (cont. p. 2)

Warm Season Hazards

Dave Martin—General Forecaster

Last spring we reviewed the dangers of lightning, insects and snakes, along with some other hazards. A concern this year centers around the mild winter we had. So far it looks like Spring will continue this warm pattern. Some long range forecast suggest this milder than normal trend could linger into late spring or even early summer. March 2012 was a good example of how warm it can get in the early spring and some of the problems that can result.

(cont. p. 3)

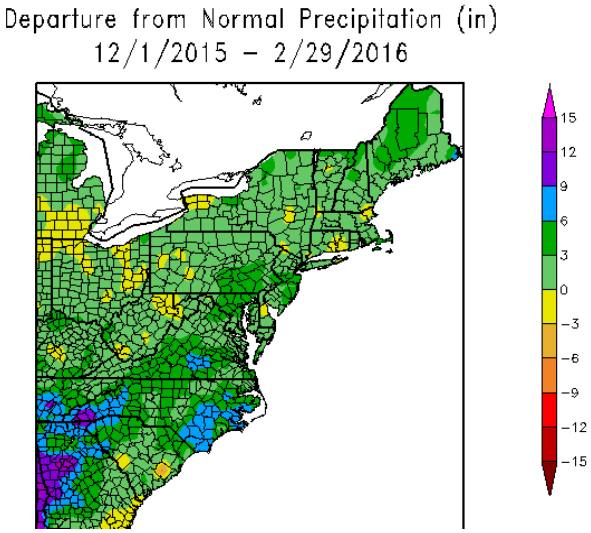


Figure 2. Winter Precipitation Departures

it worked out quite well. Truth be told however, most if not all of this was because of one storm, the Blizzard of January 22-24. Figure 5 shows the snowfall from this storm which affected a fairly small geographical area from about West Virginia east to Southern New England, but in some places it provided close to or even more snow than what normally falls in an entire season. Baltimore, MD which has an average winter snowfall of 20.1 inches, received 29.2 inches from the storm. Harrisburg, PA got 30.2 inches of snow from the one storm, their normal snowfall is 30.6 inches.

But despite the paralyzing snow from this storm, the winter overall will go down as one of the warmest and least disruptive in a very long time.

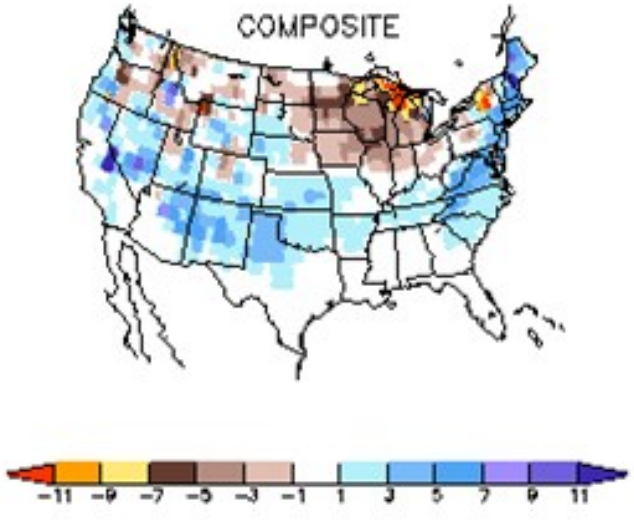


Figure 3. Seasonal Composite Snowfall During El Nino Years

El Niño

What of the El Niño then? There were high hopes that the near record El Niño would help break the multi year drought that has been affecting California. A "typical" El Nino favor's wetter than normal conditions all along the west coast, especially southern California and the Gulf Coast states from Texas to Florida. This didn't quite work out for the area of southern California to the Texas-Louisiana coasts as the storm track proved to be a little north of what is typical.

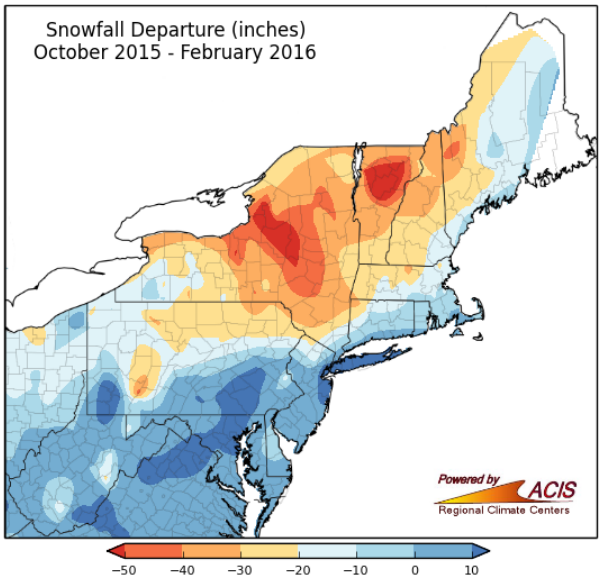


Figure 4. Seasonal Snowfall Departures

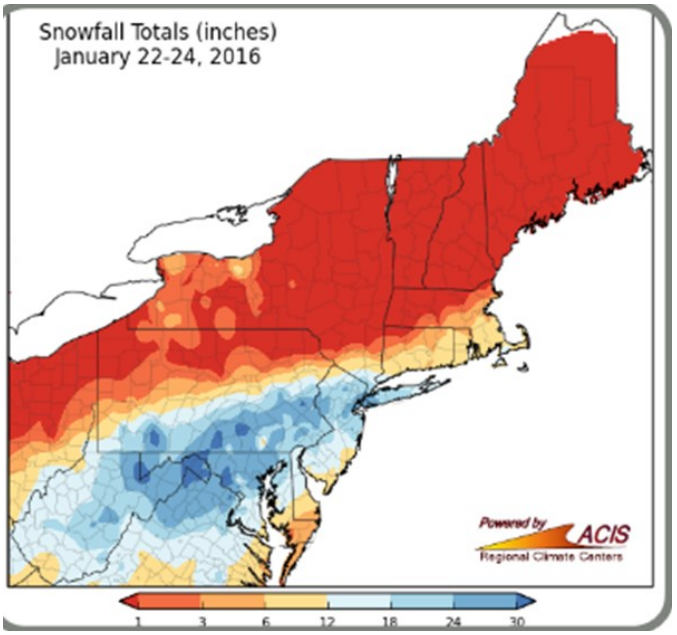


Figure 5. Blizzard of Jan 22-24, 2016

For a more complete description of Global impacts, visit:

https://www.climate.gov/news-features/blogs/enso/march-2016-el-ni%C3%B1o-update-spring-forward#comment-1499

Summer 2016

So after a very warm winter, what might the upcoming Summer bring? The Climate Prediction Center's (CPC) forecast for the season (June -August) shows about a 60-70% chance of the Summer being warmer than normal here in Pennsylvania (Figure 6 on page 3). In fact a warm Summer is forecast for all the contiguous U.S. and Alaska.

The precipitation forecast which is not shown calls for the lower 48 states to have equal chances of seeing wetter/drier or near normal rainfall. (cont. p. 3)

Winter in Review cont.

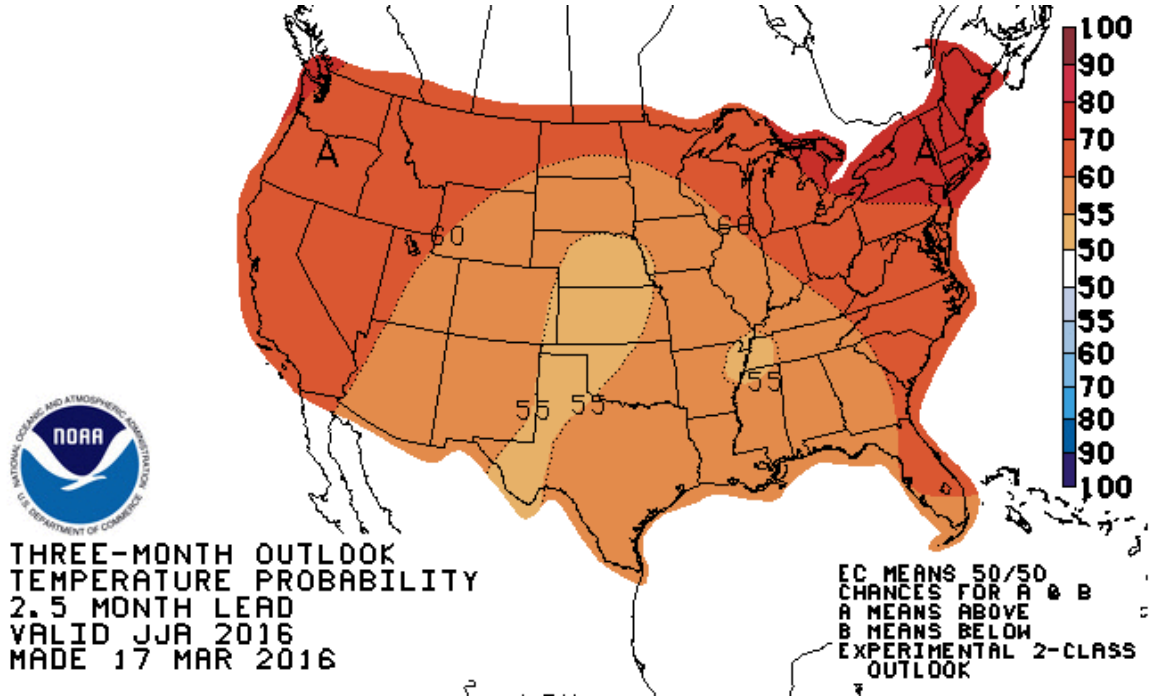


Figure 6. Summer Temperature Forecast from CPC

Warm Season cont.

March 2012 featured record warmth with temperatures more typical of a normal April, with some days in the 70s and 80s. This resulted in an early green up, along with an early emergence of insects that did not die off over the previous winter which was also much warmer than normal. This was especially the case for mosquitoes.

Pennsylvania has also seen a large number of deer ticks and cases of Lyme disease in recent years. Given the warm winter and warm conditions early on in March this year, insects such as ticks and mosquitoes will no doubt get an early start.

Many communities spray for mosquitos, as they can carry diseases such as encephalitis. And add to that a new problem that has made headlines, the Zika virus. This virus since the 1950s has occurred in a narrow equatorial belt from Africa to Asia. The virus has spread eastward across the Pacific Ocean to Mexico, South and Central America and the Caribbean in recent years. The *Aedes* mosquito population which carries the Zika virus has been found on Capitol Hill in Washington DC. Evidence suggests that they survived at least four consecutive winters in that area. It appears that the mosquitos are adapting to the increasingly persistent warmth of the northern winters.

The full extent of the problem is yet unknown. The virus is mainly transmitted by these daytime-active mosquitoes. Common symptoms include a rash, fever, red eyes, and joint pain, but many who are infected never experience symptoms.

The *Aedes* mosquito is known to be able to breed in as little as 2 teaspoons of water, so eliminating possible spawning grounds is a huge challenge. You can help by eliminating all standing water. Some examples of places where this can happen are old tires, bottles, cans, wading pools and pet dishes. They are just a few of the possible places where mosquitoes of all species can reproduce.

As we noted before, many things we take for granted can be dangerous. Other Insects, plants, weather, and animals are just a few of the hazards. Listed below are some additional examples.

LIGHTNING

Lightning is the #2 weather killer in the U.S. While Florida leads the country in deaths and injuries, Pennsylvania has seen its share of lightning injuries and deaths. It is estimated that upwards of 10% of lightning incidents result in death. A little known fact is Pennsylvania ranks #1 in lightning damage. Lightning deaths peak in July during the afternoon hours. Often the storm has passed the area, but lightning can still strike more than 20 miles from the storm. Men comprise about 80% of lightning related deaths. It is thought this is because men are often outside working or playing sports, such as golf. Lightning can spread out horizontally along the ground for 60 feet from where it strikes. Seeking shelter under trees or using a corded phone increases your risk of being struck. (cont. p. 5)

2015-16 Snow Drought for Northeast U.S. Ski Resorts

Barry C. Lambert—Lead Meteorologist

Ski areas across the northeastern U.S. had dramatically shortened seasons, and their enthusiastic customers dealt with poor snowfall and slope availability during this highly anomalous warm winter season (thanks to a very strong El Nino – comparable to the episodes in 1982-83 and 1997-98). Terrain opened for the busy Christmas break was the lowest on record at major northeast resorts! The complete adverse impact on revenue for corporations operating these huge resorts has yet to be fully assessed and calculated, and could affect various facets of their business (including equipment, facility, and lift upgrades) for years to come. Another unfortunate impact of the horrendously low winter snowfall could manifest itself as higher cost for lift tickets, rental equipment and food.

The management at Killington VT (who recorded their lowest snowfall total ever, with 59 inches as of March 21st) went so far as to almost fire Old Man Winter for his abysmal job performance this season. You can watch their bitter meeting with the dejected gent here – https://www.youtube.com/watch?v=AnErVltVyTQ. Killington's biggest snowfall this season so far was a piddly 7 inches on Feb 25-26^{t} Normal seasonal snowfall at Killington is 250 inches. You can check out a comparison of snowfall statistics over the past 30 years via this link - http://snowdaze.com/killington-historical-snowfall Figures 1-3 show maps of temperature and precipitation departure, and snowfall totals for the Winter Season (Dec 21, 2015 – March 21, 2016).

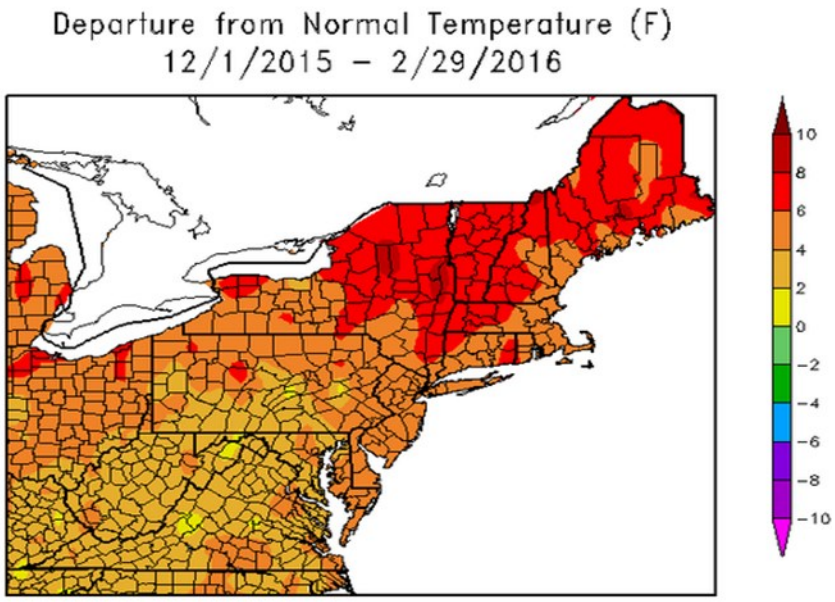


Figure 1. Winter Temperature Departures

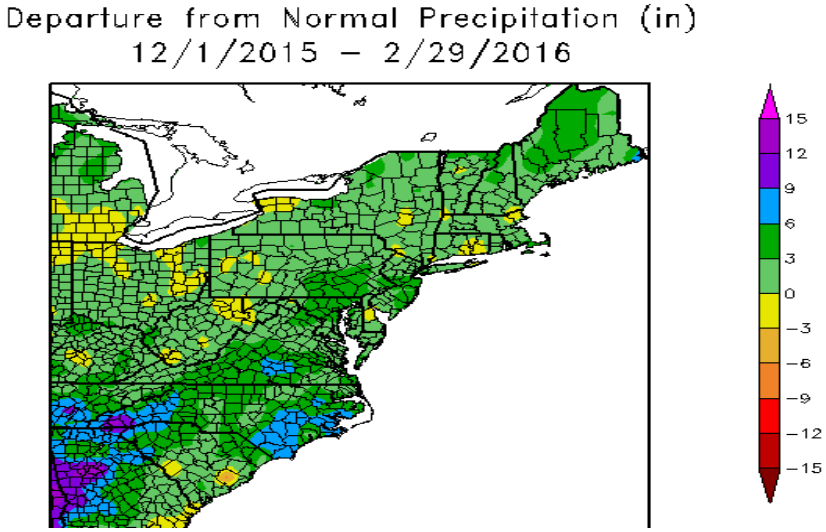


Figure 2. Winter Precipitation Departures

Taking a first glance at Figure 3 (page 6), it might appear that parts of the Central Appalachians and Mid Atlantic region experienced a winter with near or even above normal snowfall. However, the huge one-time impact by the Blizzard of 2016 (Jan 21-24, 2016) accounted for an extremely large percentage of the season's snowfall (Figure 4, page 6). Absent that storm, many major cities in the Mid Atlantic region would be seeing one of their least snowy years in history. Most major ski areas across the Central Appalachians also saw well below normal snowfall for the season and challenging operating conditions.

Tables 1 and 2 (page 6 & 7) highlight the stark contrast in early spring skiing conditions over the snow-starved Northeast U.S., and the powder-blanketed Southern Rockies. Most of the larger Northeast resorts typically offer 80% or more open terrain on the first day of Spring. This year, even the resorts containing extensive snowmaking coverage struggled to keep open 50% of their slopes.

A bit of encouraging news for northeast U.S. skiers and ski resorts, La Niña conditions have followed six of the ten moderate and strong El Niños that occurred since 1950, including two of the three previous strongest El Niños. However, because this is still a rather small number of cases, it indicates that it's difficult to make a very confident forecast based only on these previous events.

The start of the 2016-17 Season in the fall is still many months away, and computer climate models have a difficult time making accurate forecasts through the "spring barrier" period of March–May. This is the point in the year when El Niño and La Niña are often weakening and changing into neutral. Still, most computer models are in decent agreement that La Niña (strength to be determined) will develop by the fall.

(cont. p. 6)

OTHER INSECTS AND SNAKES

Other insects can pose a risk. Wasps, hornets, bees, mites, ticks, and fleas are just some to be aware of. Some may have an adverse reaction from bee stings. Those who are sensitive to insect stings should be alert for a reaction and seek medical attention as needed. Watch out for nests that are underground.

Many types of spiders live in Pennsylvania but very few actually bite. The Black Widow spider is one to watch out for, though it's bite is usually considered to be about as severe as a bee sting.

Upwards of 22 different kinds of snakes live in the Keystone State. Of these, three are venomous, two of which can be found in Central Pennsylvania. One is the Timber Rattlesnake, and the other the Copperhead. Caution is urged in areas where these snakes are known to inhabit. Areas with many rocks often are generally preferred by snakes. If possible try to avoid the areas of concern and remember, it is illegal kill these creatures in Pennsylvania. Every effort should be made to avoid and not harm them.

As noted above, ticks have been a growing problem. Deer ticks are small and hard to see. Have others help check for ticks if you have been spending time outside and suspect you might have picked some up. Bites from these ticks can result in Lyme disease, which if left untreated could cause life long debilitating illness and injury.

Other diseases include Rocky Mountain Spotted Fever, and West Nile Virus. Recent changes in weather patterns are thought to have had an influence in bringing some of the insects that spread these diseases father north into regions where the climate was previously too cold to support their survival.

The news isn't all bad. Weather may also have a positive influence on good or beneficial insects such as Monarch Butterflies and Lady Bugs. There have bene numerous stories describing how Monarch populations may be further aided by the planting of NATIVE MILKWEED which naturally attracts and provides the butterfly a place to breed.

PLANTS AND OTHER HAZARDS

When outdoors, you should also be alert for poison ivy, oak, and sumac. Avoid burning these plants, as the smoke can be a contaminate. In addition to the leaves, the stems and other parts of these plants can cause an adverse reaction.

While water from fast flowing streams in the spring may look clean and safe, be careful about drinking from streams and lakes. What looks to be clear and clean water may actually be contaminated. One such organism that can be found in some areas is Giardia Lamblia, which can cause gastrointestinal problems. The number of cases started to increase in the 1980s across the country and the cause of this is unclear. Proper water treatment including filtration is needed to assure the water safe to drink.

In addition to Giardia, several areas of the country have seen outbreaks of Cryptosporidium in recent years which can cause symptoms similar to those of Giardia.

Another hazard is sunburn after a long winter. While a small amount of sunshine may be good for Vitamin D production, getting too much sun is likely to result in sunburn. Wear protective clothing and use a sun screen. Heat stroke and heat exhaustion are other problems that can occur with extensive exposure to the sun in hot and humid conditions. Persons working or spending time outside should stay hydrated and take frequent breaks in the heat. Remember to start slow with warm season yard work and outdoor exercise after a long winter.

If you plan to spend time on area waterways, make sure to have proper training and have a USCG approved personal flotation device (life jacket or PFD) for each person on board.

And remember, have a safe and fun spring and summer.

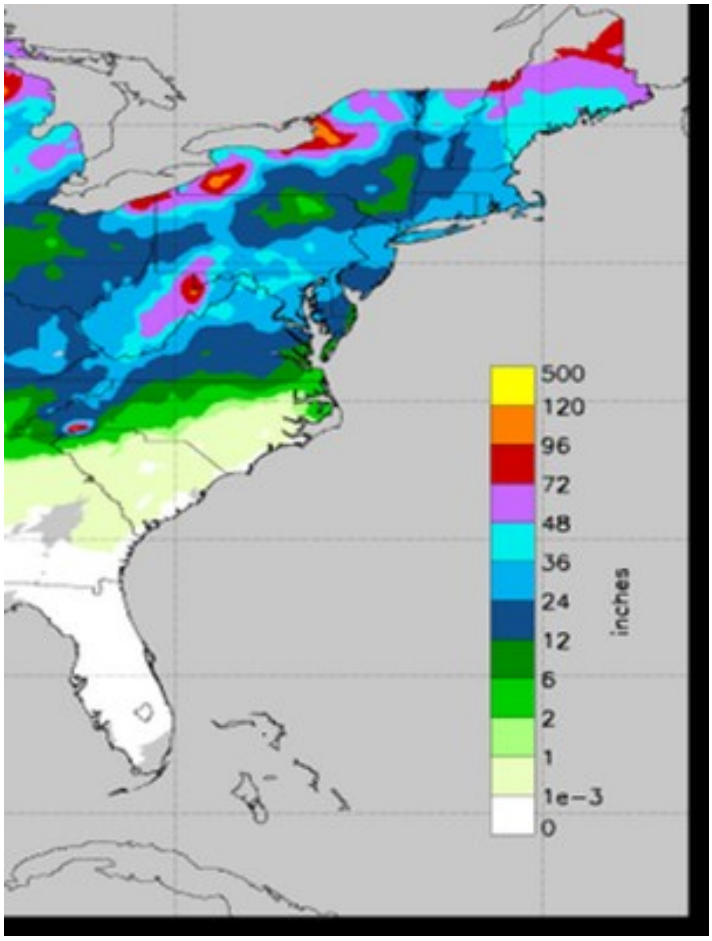


Figure 3. Observed 2015-16 Winter Season Snowfall through March 21, 2016

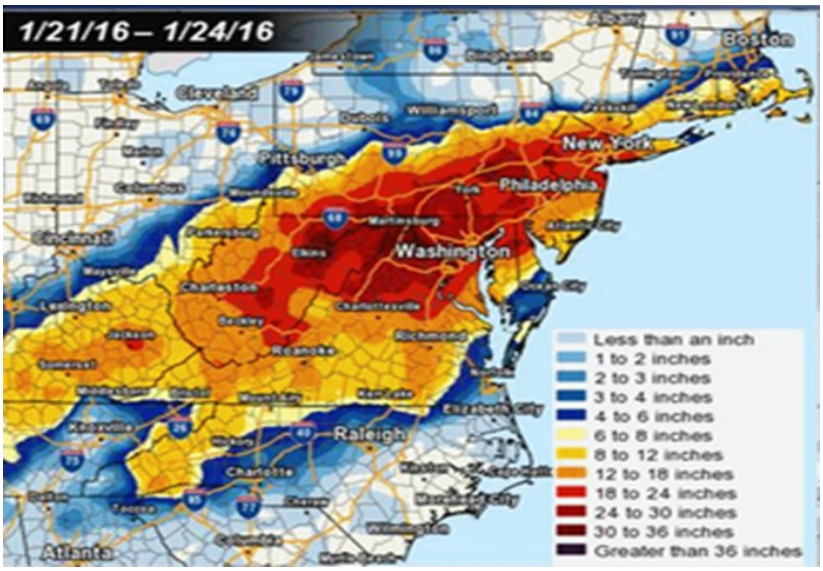


Figure 4. Observed Snowfall January 21-24, 2016

It should also be emphasized that La Niña is only one piece of the puzzle that controls which locations get the most snow during the winter. Other climate factors such as, the state of the Indian Ocean, the south-eastern Pacific or the tropical Atlantic sea surface temperatures (and the random nature of each individual snowstorm) also dictates where the snowflakes will fall.

Northeast:

Mid-October cold allowed Killington and Sunday River to open first in North America on October 19. After a week of skiing the snow melted and snowmaking did not resume for nearly 3 weeks. With minimal natural snow and sustained unseasonably warm temperatures, terrain open at Christmas was the worst on record. Terrain open increased moderately in Quebec with a foot of snow during Christmas Week but only slightly in New England. Colder weather finally arrived in the first half of January, with Vermont snow ranging from 1-3 feet south to north. Second half of January snow averaged only about a foot, so the natural snow base reached only 2 feet. As is common, the big late January storm through the eastern metro areas was not a big snow producer in upper New England and Quebec. 1-2 feet fell during the second week of February but it rained during the first and third weeks. Late February snowfall ranged from 1 foot in the south to 3 feet in the far north. First half of March snow was less than a foot, so the warming weather terrain is closing trails prematurely. In terms of both snowfall and open terrain, 2015-16 is on track to be the worst eastern season on record, though eastern Canada is faring somewhat better than New England. Percents open: Okemo 52%, Stratton 53%, Hunter 67, Sugarloaf 34%, Sunday River 68%, Tremblant 68%, Mt. St. Anne 100%.

Area	Season Snow	Pct. of Normal	Pct. of Area Open
Jay Peak (mid estimate)	149	55%	42%
Stowe	120	48%	58%
Sugarbush	124	56%	54%
Killington	58	29%	31%
Whiteface	93	63%	52%
Cannon Mt.	85	64%	52%
Le Massif	166	88%	98%

Table 1. 2015-16 Winter Season Snowfall and Percentage of Normal, along with Current Percentage of Slopes Open at Major Northeast U.S. Ski Resorts, including a brief overview of the season (bestsnow.net).

(cont. p. 7)

Southern and Western Colorado:

The central Colorado mountains had a below average November, while the southern mountains and New Mexico were above average. Wolf Creek's base reached 50 inches by the end of November. The second week of December storms were also stronger in the southern (2-3 feet with 4+ at Wolf Creek) than central (1-2 feet) mountains. 2-3 feet of snow fell during the week before Christmas and an average 2 feet (4 feet at Wolf Creek) during Christmas Week. First half of January snow was 1-2 feet, but likely more in New Mexico. Second half January snow was 3 feet in the central mountains and 1-2 feet farther south. 2+ feet fell at the beginning of February but less than a foot for the rest of the month. In early March the central mountains got 1.5 feet of snow but the southern areas less than a foot. Taos had its second best holiday season in over 20 years and opened the Kachina chair Jan. 13, but has had less than a foot in the past month and is now 87% open.

Area	Season Snow	Pct. of Normal	Pct. of Area Open
Aspen/Snowmass	192	99%	100%
Gothic Snow Lab	217	78%	N/A
Crested Butte	138	71%	98%
Telluride	256	123%	94%
Purgatory	212	105%	99%
Wolf Creek	343	117%	100%

Table 2. 2015-16 2015-16 Winter Season Snowfall and Percentage of Normal, along with Current Percentage of Slopes Open at Major Ski Resorts in the Southern Rockies, including a brief overview of the season. (bestsnow.net).

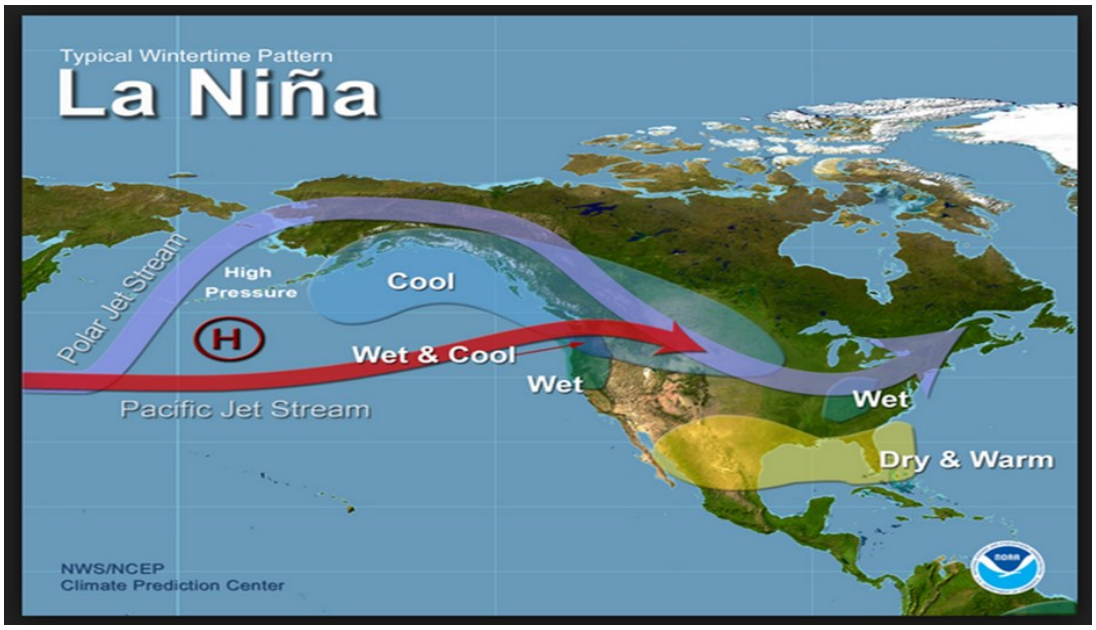


Table 2. Typical Jet Stream Pattern and Conditions across North America during La Nina

So, while La Niña is something we should keep a close eye on next winter season, we shouldn't count on it as our sole predictor of the amount, and the monthly and areal distribution of the snowfall. It's worth noting that the last strong La Nina was in 2010-11 when many western and NE U.S. ski areas got buried in snow with Jay Peak, VT receiving 376 inches and Squaw Valley, CA - 811 inches! (http://snowbrains.com/official-noaa-el-nino-update-la-nina-possible-fall-2016/).

Here are a few additional interesting links to check out -

https://opensnow.com/news/post/el-nino-part-3-how-will-el-nino-impact-snowfall-for-the-2015-2016-ski-season
http://www.ski.com/blog/states-typically-see-average-snowfall-el-nino-winters/

https://www.climate.gov/news-features/blogs/enso/march-2016-el-ni%C3%B1o-update-spring-forward

http://www.nohrsc.noaa.gov/snowfall/

The Effect of Global warming on Northern Hemisphere Temperature Extremes

Richard Grumm—Science Officer

The climate forecast system reanalysis (CFSR) data from 1979-2016 was used to examine the area of the northern hemisphere covered by extremely warm and cold air during the winter and summer seasons respectively. The winter was defined as the months of December, January and February and the summer was defined as June, July and August.

The CFSR 850mb temperatures were used to compute the area covered by the warm or cold air. The 850mb temperatures are often used as a means to estimate surface temperature and at close to 1.5km (about 5000') above the surface they are not affected by urban heat island effects and the limitations often associated with surface observing systems. The areas were used to account for more grid points near the pole as the lines of longitude converge. Near the equator one grid point represents an area of over 10,000 square kilometers while at the pole one point affects an area of under 200 square kilometers.

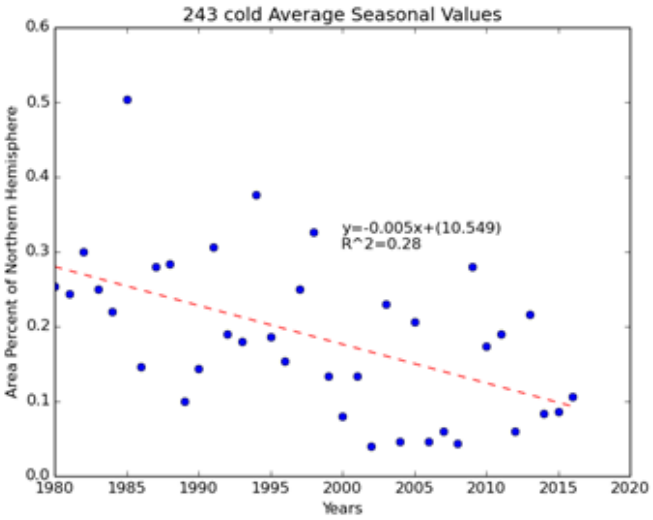


Figure 1. The area of the northern hemisphere covered by air of -30C (243K) or cold air during the months of D-J-F for the years shown. For each month 6-hourly values were used to compute the mean area for the month and season. The x-axis shows the year and the y-axis shows the percent of the northern hemisphere covered by the -30C or colder air. The red dashed line is the trend line and for the statisticians the linear regression equation and R-squared values are shown.

During the winter, areas covered by airmasses as cold as -30,-25,-20, and -10C were used to define cold pools. The "crème de le crème" of arctic air is often associated air of -30C (243 Kelvin) or colder values. The graph shows the area of the northern hemisphere covered by the -30C contour at 850mb during each winter season. While there is considerable year to year variability, the trend (red line) shows a steady decrease in the area covered by intensely cold arctic air. All 4 temperature intervals showed a negative trend but the area covered by the -30C air mass had the strongest and most statistically significant signal.

During the northern hemisphere summer months, the 10, 20, and 25C contours were used to define the areas of extreme warmth. The signal was stronger in the areas covered by both the 20 and 25C contours. As a point of reference, in Pennsylvania 850mb temperatures over 20C occur a few times during the summer months and are typically associated with heat waves where surface temperatures exceed 95 to 100F. These data clearly show a steady increase in the area covered by air of 20 and 25C or warmer over the northern hemispheric summer.

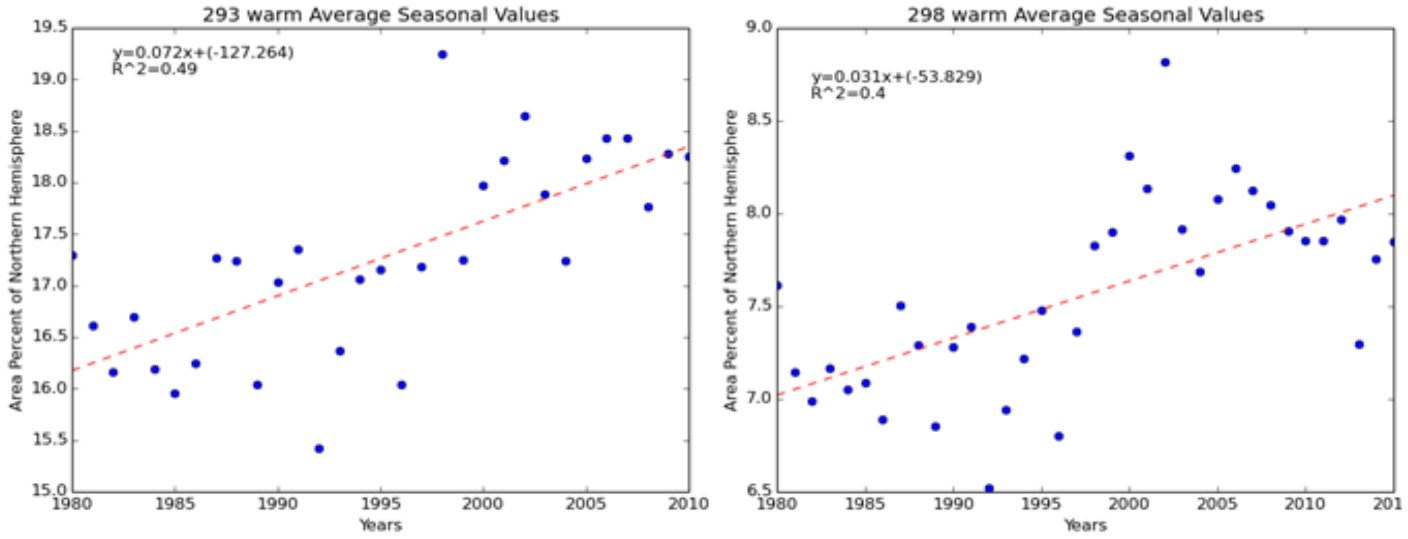


Figure 2. As in Figure 1 except for the areas covered by the 20C (293K) contour and by the 25C (298K) contour.

(cont. p. 9)

Temperature Extremes cont.

These data show that as forecast by climate models, the impact of global warming is in the extremes. During the northern hemisphere winters the extreme cold arctic air masses are getting smaller. This implies fewer extreme arctic outbreaks of shorter duration. During the northern hemisphere summer, the warm air masses are getting larger and warmer suggesting the potential for more warm episodes and heat waves which may be more enduring. Interestingly, the areas covered by air masses from about -10C to +15C show similar trends but are not as statistically significant implying most of the time the weather will seem similar to that of previous decades until one of the larger warm air masses affects a region.

We are examining other fields such as 500mb heights (around 18,000') and are compiling similar statistics for the southern hemisphere.

The White Horse Tornado

Zach Chabala—Student Intern

The tornado that occurred in White Horse, Lancaster County PA on February 24, 2016, damaged nearly 50 structures and caused roughly 8 million dollars in damage.

Formation

The White Horse tornado was just one of many tornadoes that were caused by a much larger low pressure system that moved through the eastern U.S.. During the day of the tornado, temperatures over central Pennsylvania remained stuck in the upper 30s and low 40s in the morning into the early afternoon. During the afternoon a strong warm front crept north across the southeastern portion of the state. The wind direction change from weak out of the north or northeast to strong out of the south-southeast was accompanied by a rapid temperature surge into the mid-60s along with dew points which climbed into the upper 50s and lower 60s. This warm-moist air (provided the unstable airmass) interacted with the lift associated with the approaching cold front and helped form a line of showers and thunderstorms, and eventually the storm that spawned the White Horse tornado.

Around 7:35 PM, as the line of storms moved across Lancaster County, a thunderstorm along the line intensified and produced the tornado. Figure 1 is a radar reflectivity image of the storm with the arrow indicating the strong inflow "notch" into the back side of the storm.

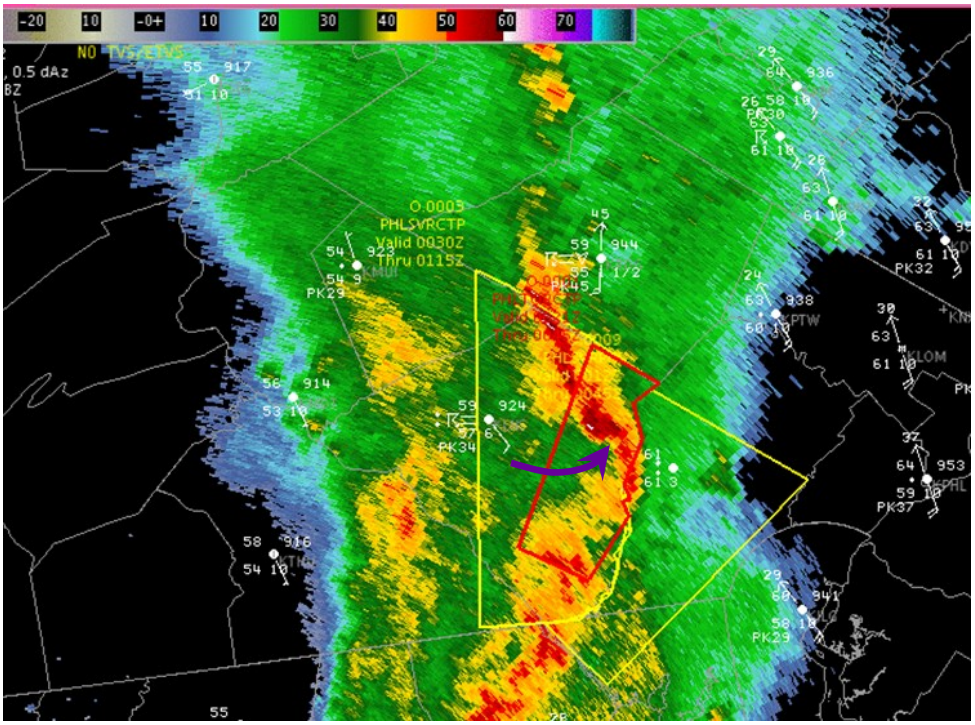


Figure 1. Radar reflectivity image during the White Horse tornado.

Figure 2 (page 10) is a radar velocity image from the Philadelphia Doppler Radar during the tornado. The green colors indicate winds moving towards the radar and the red colors indicate winds moving away from the radar. The area where these colors meet indicates that there is circulation in the storm. In this case the inbound winds were so strong they shifted out of the green into the darker blues indicating winds in excess of about 90 knots, or roughly 103 mph! The black arrow shows were the tornado was at the time this image was captured.

Impacts and Damage

The tornado stayed on the ground for roughly 7 minutes and damaged roughly 50 structures during this time. These structures ranged from sheds, barns, and houses. The damage ranged from siding being blown off to structures being completely destroyed. An estimated 8 million dollars in damage occurred but fortunately nobody was killed during this event. (cont. p 10.)

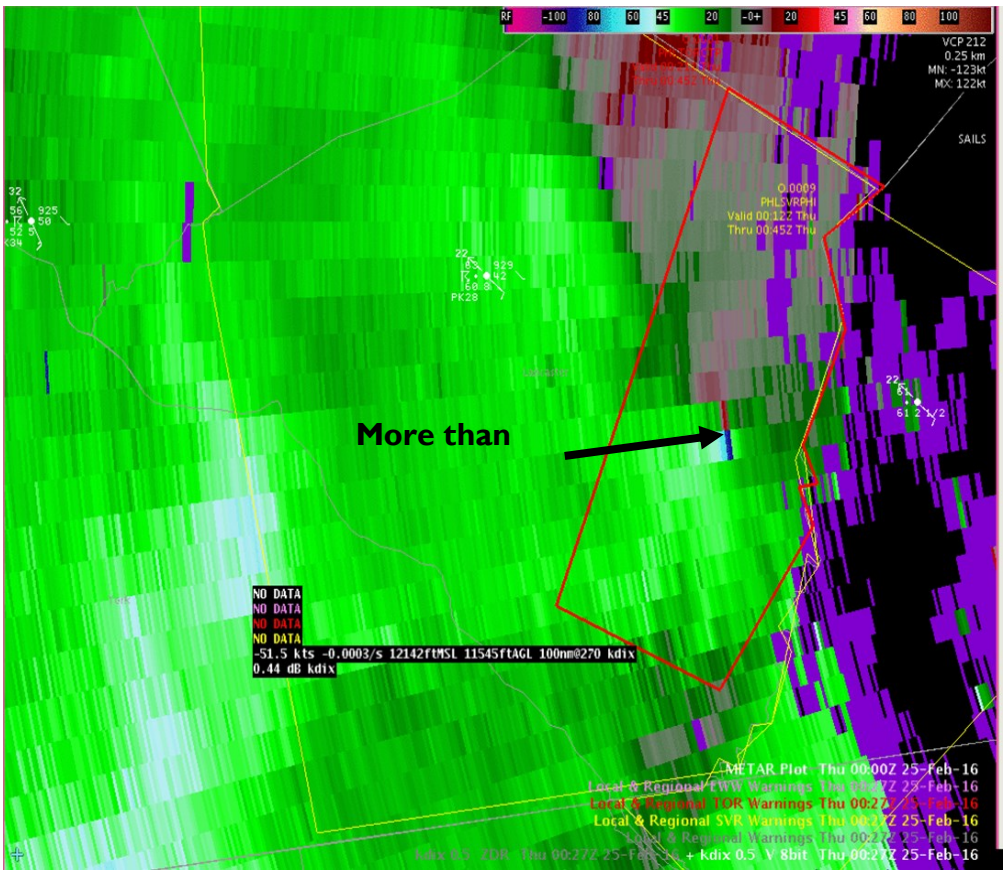


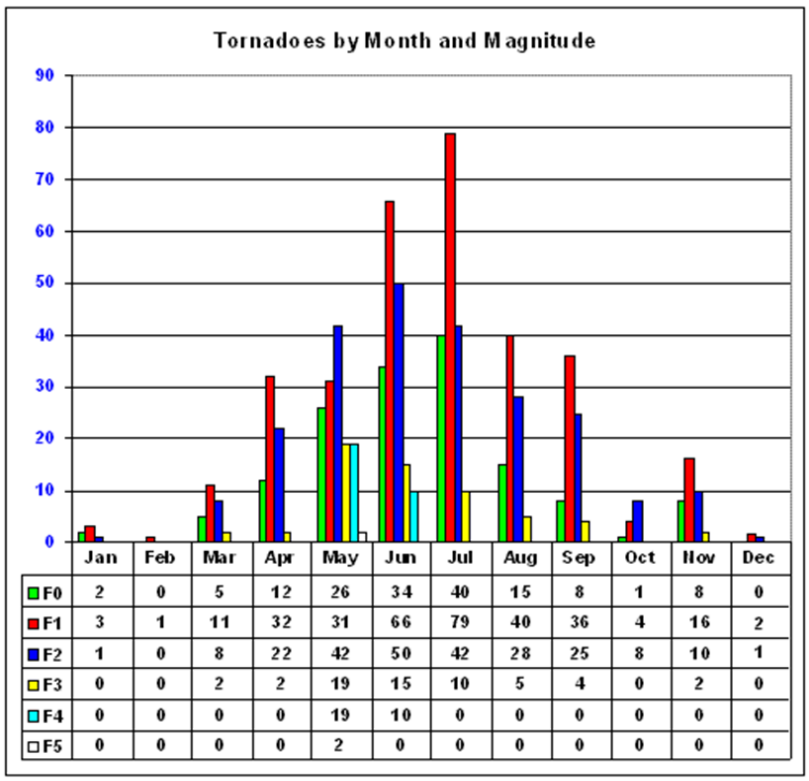
Figure 2. Radar velocity image during the White Horse tornado.

After the tornado, the community came together and quickly cleaned up the damage and started rebuilding. Roofs were fixed and buildings were reconstructed just days after the tornado.

Rarity

February tornadoes in Pennsylvania are extremely rare. Prior to February 24th there was only one tornado to hit the state during the month of February since 1900. That tornado occurred on February 16, 1990 in Centre County and it was an EF-1. This makes the White Horse tornado the strongest February tornado in PA on record. There was also another tornado that occurred on the same day in Bradford County near Wyalusing. These two tornados doubled our previous number of February tornados in one day.

Figure 3. The top left image is of a house that had its roof completely blown off. The top right image is of a machine shed that sustained heavy damage. The bottom left image is of a house that had the roof blown off and windows blown out. The trees were almost completely delimbed. The bottom right image is of a shed that was completely destroyed.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
F0	2	0	5	12	26	34	40	15	8	1	8	0
F1	3	1	11	32	31	66	79	40	36	4	16	2
F2	1	0	8	22	42	50	42	28	25	8	10	1
F3	0	0	2	2	19	15	10	5	4	0	2	0
F4	0	0	0	0	19	10	0	0	0	0	0	0
F5	0	0	0	0	2	0	0	0	0	0	0	0

Figure 4. Graph showing the number of tornadoes that occurred in Pennsylvania by month and strength

(cont. p 11.)

Update Your Spotter Information

Bill Gartner—General Forecaster

Please help us to keep your contact information up to date. 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 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.

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

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 and we will verify it.

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 email notification, or communicate important program changes.

SkyWarn Training Classes now in Session

If it has been a while since you attended a SkyWarn training class, the Spring and Summer months are a good time for a refresher. This is the time of year when they are offered most often. Check our web page at the following link for an up-to-date list of classes across central Pennsylvania.

http://www.weather.gov/ctp/SpotterTalks

Be sure to register for the class by following the instructions on the page.

Warm season reporting criteria:

For your convenience, a list of reporting criteria and reporting methods is available on our web page, www.weather.gov/statecollege. Click on "Send a Report" under the "Current Hazards" column.

- **Tornadoes or funnel clouds** (be very wary of look-alikes; watch for rotation)
- **Wall clouds**, especially if they are rotating
- **Hail** of any size (Please be specific with regard to size when you call)

Quarter-Size (1") and larger is severe!

Other sizes/descriptions to use for hail:

- Pea 0.25 - .375 inch
- Small marble 0.50 inch
- Penny 0.75 inch
- Nickel 0.88 inch
- Quarter 1.00 inch (15/16")
- Half dollar 1.25 inch
- Walnut/Ping Pong 1.50 inch
- Golf ball 1.75 inch

(cont. p 12.)

- Pea 0.25 - .375 inch
- Lime 2.00 inches
- Tennis Ball 2.50 inches
- Baseball 2.75 inches
- Large Apple 3.00 inches
- Softball 4.00 inches
- Grapefruit 4.50 inches
- Computer CD/DVD 4.75 - 5.00 inches

- **Wind Gusts (40 mph or greater; specify whether estimated or recorded)**

  large branches downed (specify diameter of branch)

  Trees/power lines downed

  Structural damage to buildings (roof, windows, etc.)

- **Rainfall**

  1 inch or greater in an hour (NOT a 1"/hr. rate for 10 minutes)

  2 inches or greater storm total

- **Flooding**

  Streams/Rivers -- also, when nearing bankfull

  Street (when more than the usual poor drainage puddles)

ENJOY THE SUMMER !

Don't forget: we are on Facebook and Twitter