National Weather Service

Storm Fury on the Plains

Fall Spotter Newsletter November 2015

Inside this issue:

Will El Niño Impact Kansas' Upcoming Winter-Spring Weather?

By Andy Kleinsasser – Meteorologist

What kind of weather will the upcoming winter bring? As every seasoned midwesterner knows, temperatures will no doubt get colder, with periodic chances of wintry precipitation. However, will it be somewhat warmer and drier than normal such as the winter of 2014-15? Or will it be colder than normal such as the winter of 2013-14? Two tools offer some clues: long range outlooks issued by the Climate Prediction Center and the presence of a strong El Niño through at least early spring 2016. Both will be investigated below.

El Niño conditions began to show up early in 2015 and have been steadily strengthening ever since which is now reaching the "strong" El Niño status. In fact, this will likely be one of the strongest El Niño's on record (since 1950) rivaling 1982-83 and 1997-98. The current strengthening El Niño event likely contributed to the relatively wet April-May 2015 across much of the central and especially southern plains.

But what is El Niño? It is a warming of the upper ocean, or above-average sea surface temperatures, in the central and eastern tropical Pacific Ocean. Over Indonesia rainfall tends to become reduced, while rainfall increases over the central and eastern tropical Pacific Ocean. The low-level surface winds, which normally blow from east to west along the equator ("easterly winds") will weaken or in some strong El Niño cases start blowing the other direction (from west to east or "westerly winds"). La Niña, the opposite of El Niño, is manifested in cooler sea surface temperatures in the central and eastern tropical Pacific Ocean with above normal rainfall over Indonesia and below normal rainfall over the central and eastern tropical Pacific Ocean.

El Niño/La Niña is one of the most important climate phenomena on Earth due to its ability to change large-scale atmospheric circulations which in turn influences temperature and precipitation across the globe. We also focus on El Niño/La Niña because we can often predict its arrival many seasons in advance of its strongest impacts on weather and climate.

How did El Niño get its name? Before La Niña was even recognized, South American fisherman noticed the warm up of coastal waters occurring every so often around Christmas. They referred to the warming as "El Niño," (niño being Spanish for a boy

child) in connection with the Christmas holiday. It wasn't until the 1980s that the term La Niña gained prominence.

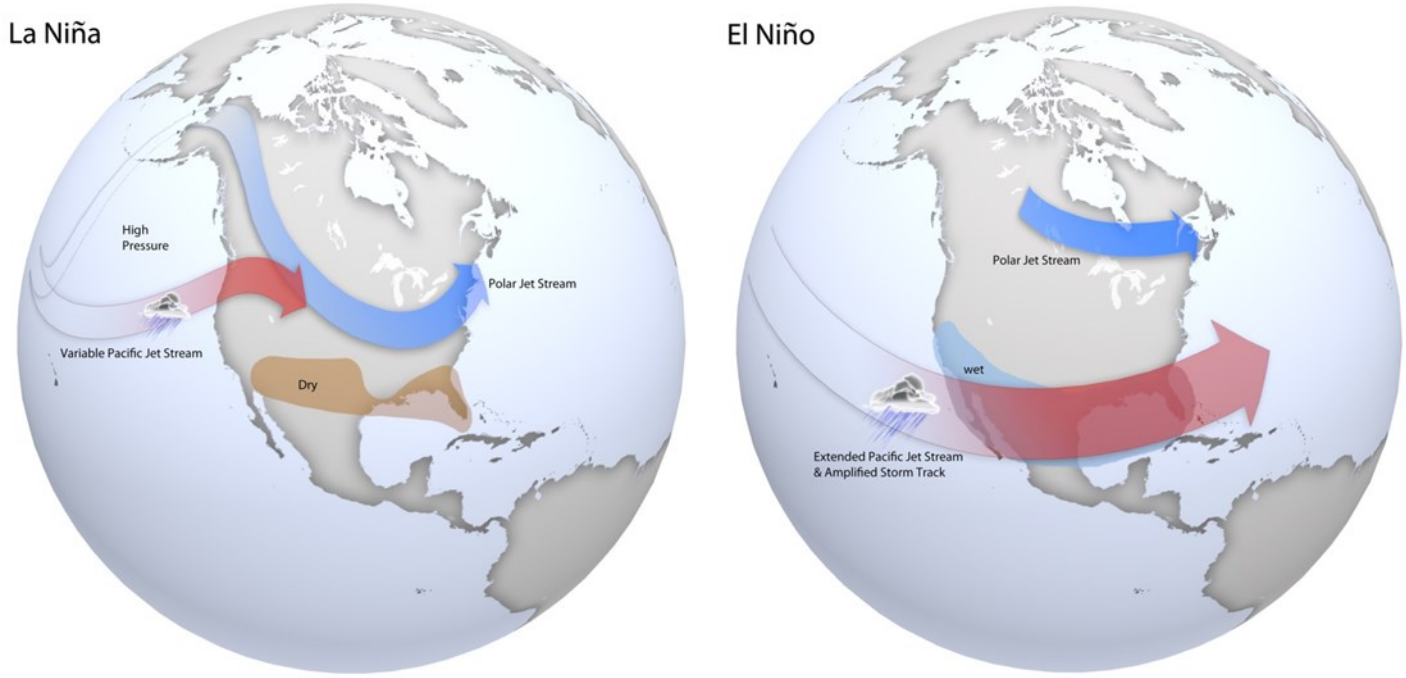

Figure 1. Typical late fall through early spring upper level jet stream positions associated with moderate to strong La Niña (left) and El Niño (right) events. During La Niña, a variable Pacific jet stream in association with a polar jet stream shifted further south favors below normal precipitation across the southern US with below normal temperatures across the northern US. During El Niño, a strong and amplified Pacific jet stream extending across the southern US in association with a polar jet stream shifted further north into Canada favors above normal precipitation across the southern US and above normal temperatures over the northern US. Courtesy of NOAA's Climate Prediction Center.

Affects from El Niño/La Niña tend to be minimal across the heartland of America including Kansas. However, moderate and especially strong events do at times impact mid-America with varying weather conditions especially during the late fall through spring months.

Figures 3 and 4 depict the risk of warm/cold or wet/dry extremes from December through April across the USA based on historical El Niño events. This data shows that historically the risk of warm temperature extremes is increased over mainly northern and northwestern Kansas from December-February with cold temperature extreme chances increasing over central and southwest Kansas from February-April. The risk of wet precipitation extremes is increased over mainly the western 2/3 of Kansas from winter through mid-spring.

Do these images represent an official winter-spring outlook or forecast? By no means! They simply represent an average of weather conditions associated with meaningful past El Niño events since 1950. Seasonal weather impacts associated with El Niño/La Niña can at times differ drastically from event to event. We would be foolish to assume that the upcoming winter-spring weather conditions will mirror those associated with past strong El Niño events. But since this will likely be a strong El Niño, probabilities increase that it will tend to "drive" the large scale weather patterns in its favor.

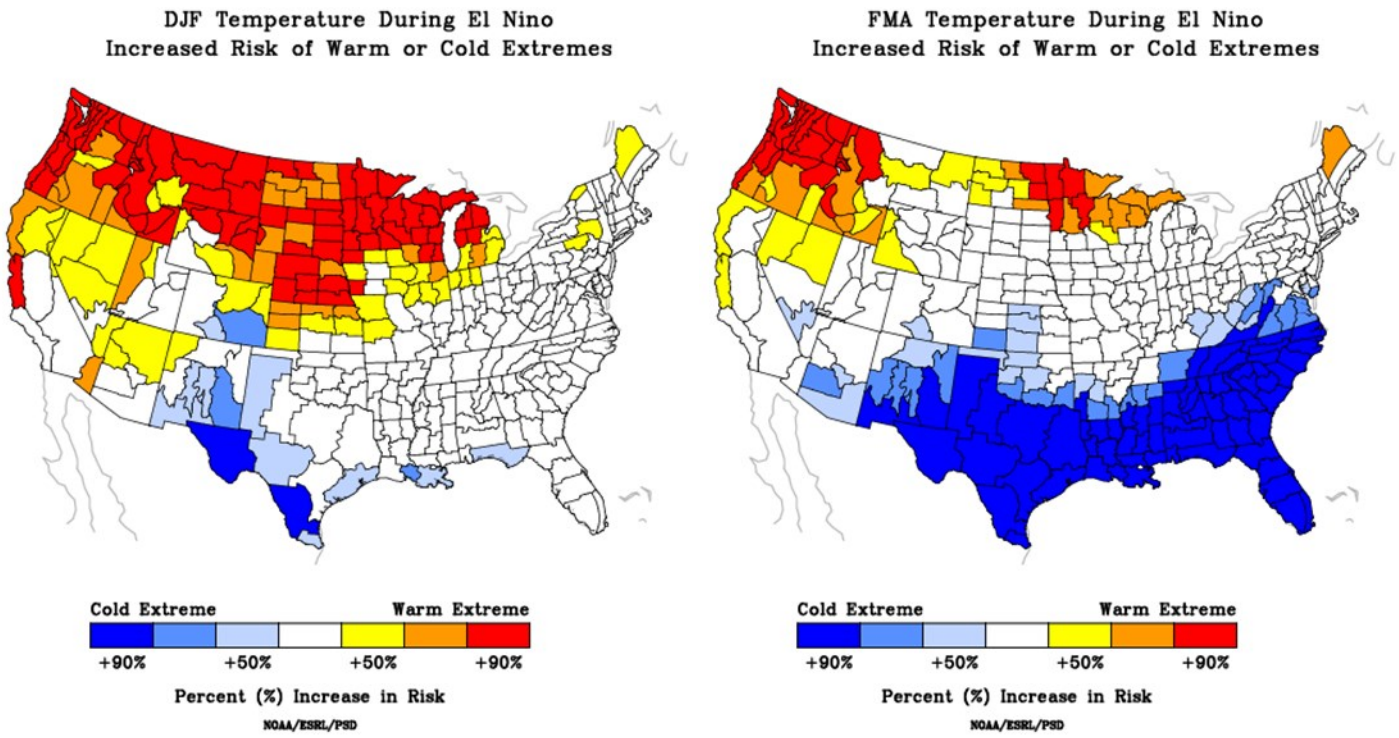

Figure 2. Risk of warm or cold temperature extremes based on historical El Niño events for the months of December-February (left) and February-April (right). For Kansas, the risk of warm temperature extremes is increased over mainly northern Kansas for December-February with the risk of cold temperature extremes increasing for February-April. Images courtesy of NOAA's Earth System Research Laboratory.

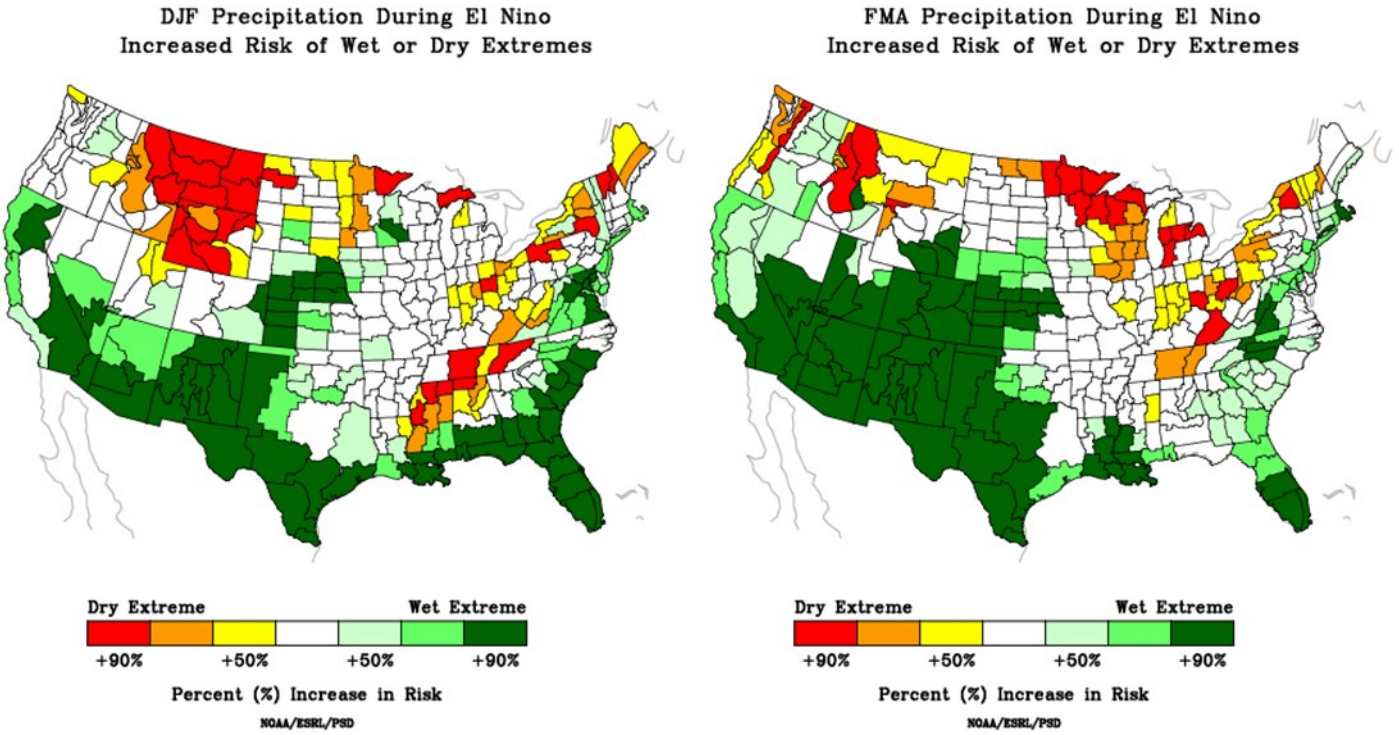

Figure 3. Risk of wet or dry precipitation extremes based on historical El Niño events for the months of December-February (left) and February-April (right). For Kansas, the risk of wet precipitation extremes is increased over mainly the western 2/3 of the state. Images courtesy of NOAA's Earth System Research Laboratory.

So what is the official winter-spring 2015-16 outlook? For this information, we need to look to the expertise of the Climate Prediction Center, a national center in Washington D.C. responsible for composing official long-range outlooks for the United States.

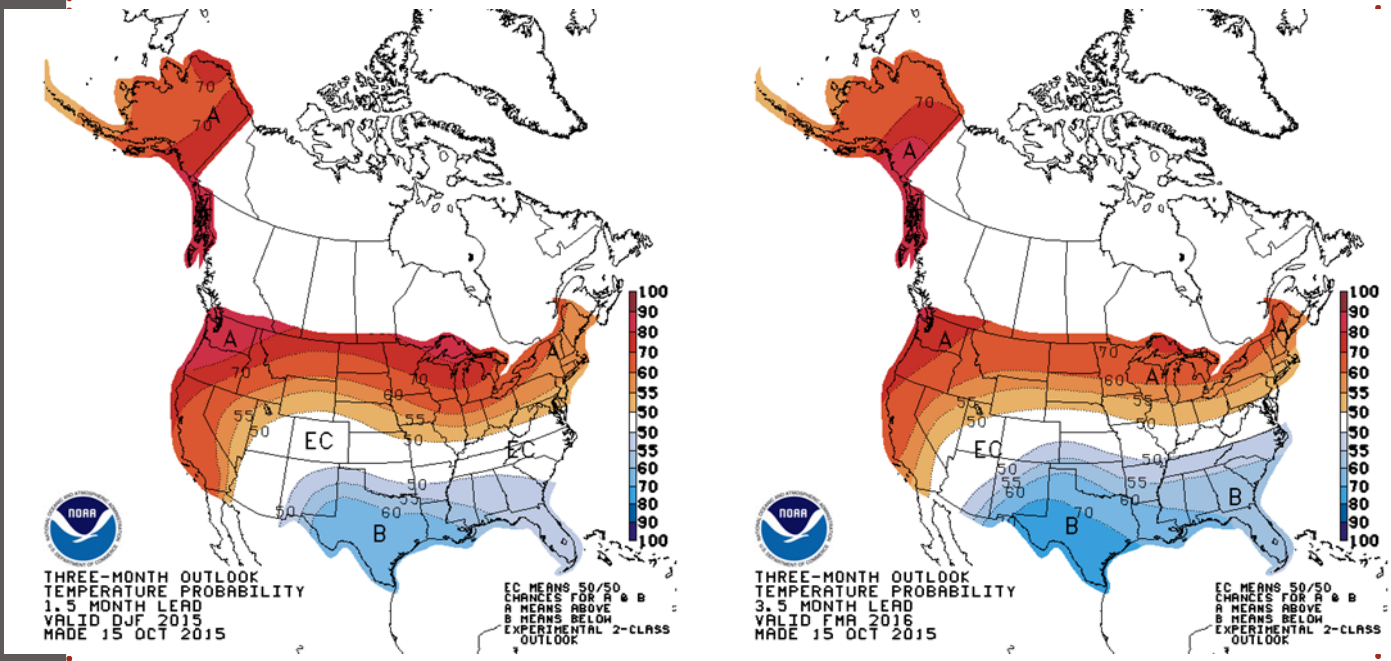

Figure 4. Official temperature outlooks issued by the Climate Prediction Center for December-February (left) and February-April (right). For Kansas, probabilities favor equal chances of above, below or near normal temperatures December-February, with probabilities favoring cooler than normal temperatures February-April over the southern half of Kansas.

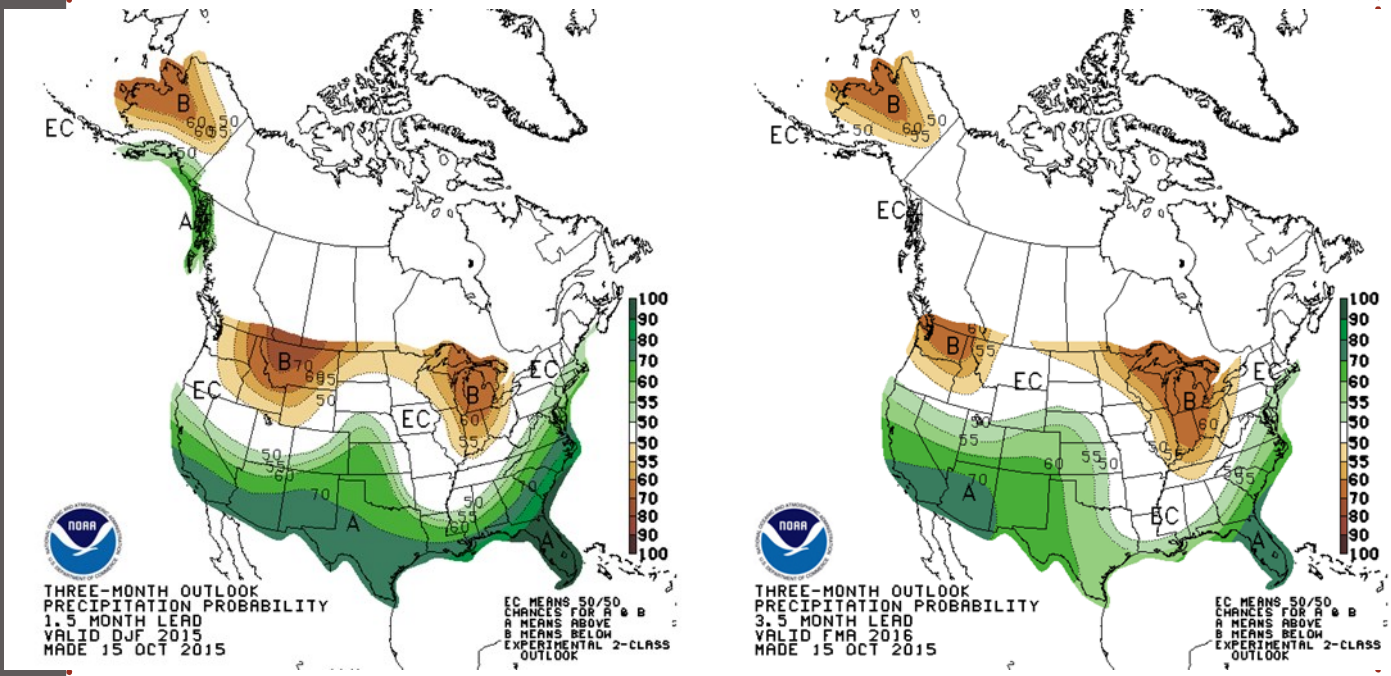

Figure 5. Official precipitation outlooks issued by the Climate Prediction Center for December-February (left) and February-April (right). For Kansas, probabilities favor above normal precipitation over generally the western two-thirds to three-fourths of the state December-April.

Figure 4 illustrates temperature outlooks for three month periods spanning from December-February (left image) and February-April (right image). These outlooks do not represent the ex-

pected magnitude of above or below normal temperatures for these three month periods but rather probabilities of above or below normal temperatures. For Kansas, December-February probabilities generally favor equal chances of above, below or near normal temperatures, while February-April probabilities favor lower than normal temperatures over generally the southern half of the state.

Figure 5 illustrates precipitation outlooks for the same three month periods as the temperature outlooks. Again, these outlooks do not represent the expected magnitude of above or below normal precipitation but rather probabilities of above or below normal precipitation. For Kansas, probabilities favor above normal precipitation over generally the western two-thirds to three-fourths of the state December-April.

With the exception of expected December-February temperatures, these outlooks closely mimic the El Niño composites in Figures 2-3 which are expected since strong El Niño's have the greatest chance of altering the large-scale weather patterns to its will.

Wichita's Newest Administrative Assistant

Ana Bruno is the new Administrative Support Assistant at the Wichita National Weather Service Office.

Ana was born in Puerto Rico but was raised on the East Coast (New York and Connecticut). She has a business degree from the University of Puerto Rico and a degree in industrial electro-mechanics from Mech Tech. Ana worked for the US Army (Active Duty, Ready Reserve, and DA Civilian) for 16 years before moving back to Kansas, where she had worked before. Upon returning to Kansas, she worked as a court interpreter until she came onboard at the Wichita National Weather Service.

Ana enjoys hiking, arts and crafts, reading, spending time with her "babies" (her dogs), but most importantly, spending time with her grandchildren.

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Also be sure to check if your county Emergency Manager has a facebook page for your county.

National Water Center Opens in Tuscaloosa, AL

By: Janet Salazar - Service Hydrologist

Responding to the nation's growing need for water intelligence to inform water management decisions, NOAA built the nation's first-ever National Water Center (NWC), located on the campus of the University of Alabama.

This 65,000 square-foot "green" building is designed with unique features to support a new, highly collaborative and comprehensive water resources services to address the needs of stakeholders and help build more resilient communities. With the capacity for 200 staff, the interagency personnel of the National Water Center include employees from NOAA, USGS, U.S. Army Corps of Engineers, FEMA, visiting scientists and contractors.

The NWC will be the first water-focused national center for collaborative research, coordinated operational water resources forecasts, adaptive planning, integrated water resource management, and decision support.

The initial focus areas for the NWC include:

- High-resolution water resource forecasts
- Applied water resources research and development center
- Proving ground for transitioning research into operations
- Flood inundation mapping
- Airborne snow and soil moisture observation analysis facility
- System interoperability and data synchronization

The National Water Center will play a critical role in enhancing water-related products and decision-support services across the country in support of the strategic objective to build a Weather-Ready Nation.

Summer Climate Highlights

By: Andy Kleinsasser - Meteorologist

Near record wet May: Multiple rounds of thunderstorms with heavy rainfall during the 2nd half of May contributed to Kansas' 2nd wettest May on record (since 1895). The culprit was a persistent area of low pressure anchored over the southwest USA which allowed for rich gulf moisture to surge north across mid-America. An average of 8.28" of rain deluged the state, 2nd only to May of 1995 when 8.79" was averaged across Kansas. Many area streams and rivers were overwhelmed by the multiple deluges producing widespread flooding across primarily low-lying areas. This was quite a change from one year ago when May of 2014 ranked as Kansas' 6th driest May on record. As far as individual cities are concerned, Wichita recorded its 2nd wettest May with 11.77", Salina its 4th wettest with 8.28", and Chanute its 6th wettest with 11.58".

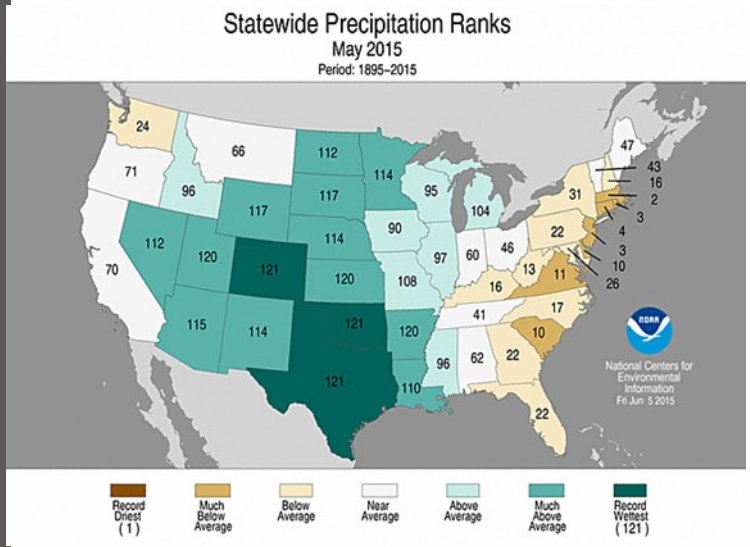

Figure 1. Statewide precipitation rankings for May 2015. Much of the central and western portions of the nation recorded one of their wettest May's on record, with Colorado, Oklahoma and Texas recording their wettest May on record. Records date back to 1895.

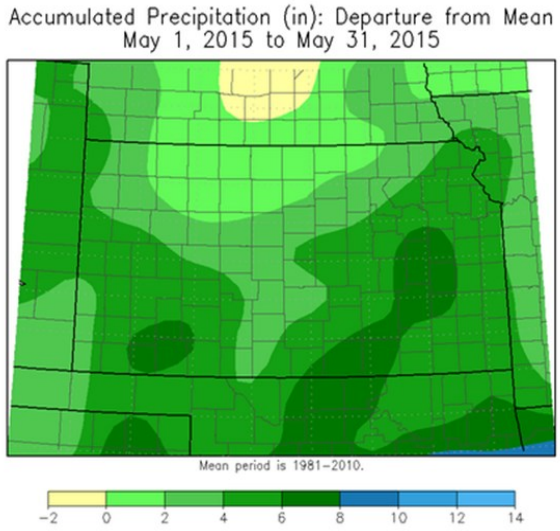

Figure 2. Kansas' Departure from normal precipitation May 2015. Nearly the entire state recorded wetter than normal conditions, with some portions reaching 6-8 inches above normal.

Warm June: June 2015 warmed up and dried out compared to May. Wichita tied its 9th warmest June on record which was also the 3rd warmest since 1991. Salina recorded its 6th warmest June on record which was also the 3rd warmest since 1992. Both Wichita and Salina reached 90 degrees or higher on 19 separate days during the month which was near the top-10 highest. Chanute tied for 3rd warmest June since 1995.

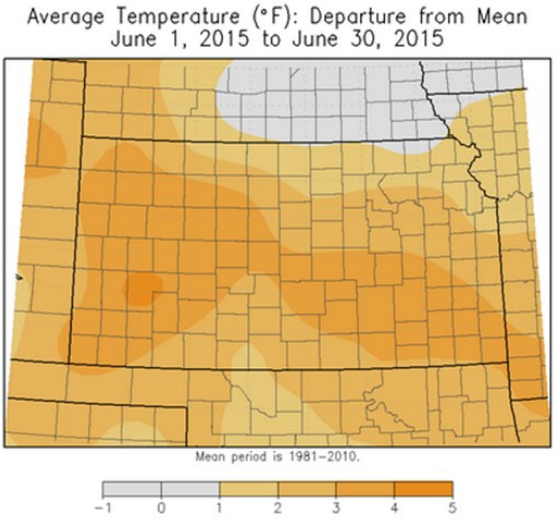

Figure 3. Average temperature departure from normal across Kansas, June 2015. Large portions of the state were 3-4 degrees warmer than normal.

Cool August: Much of Mid-America experienced a cooler than normal August. It was the first August Wichita did not experience a 100-

degree reading since August 2009. Furthermore, only 12 days during the month reached 90 degrees or higher in the Air Capital which was below the normal of 18 days.

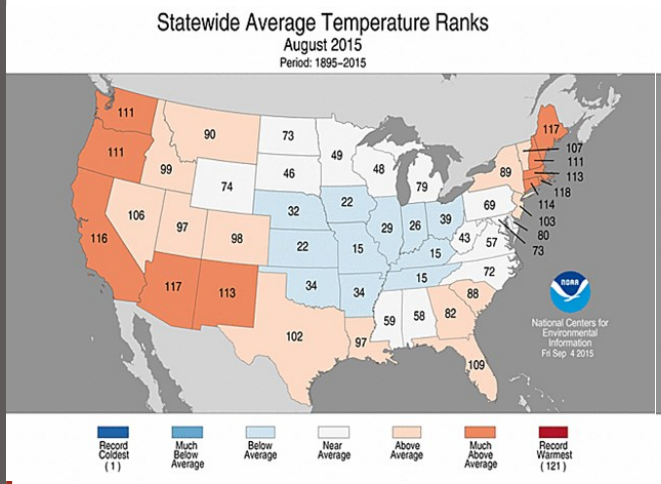

Figure 4. Statewide precipitation rankings for August 2015. Kansas recorded its 22nd coolest August since 1895.

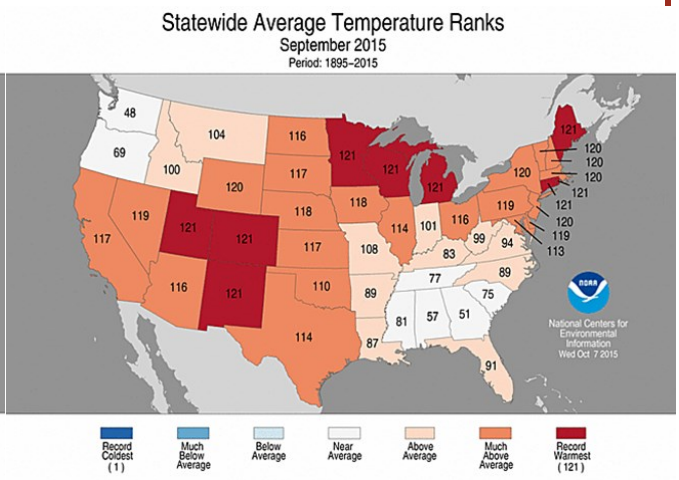

Figure 5. Statewide temperature rankings for September 2015. Kansas recorded its 5th warmest September since 1895.

Winter is Just Around the Corner

By: Jaclyn Ritzman and Chance Hayes—Meteorologists

With the winter season upon us, we would like to take this time and remind you about various different Winter Weather Watches, Warnings, and Advisories that we issue – along with their respective criteria. A Winter Storm Watch simply means we are monitoring the up and coming forecast closely as hazardous winter weather conditions look favorable over the next 24-48 hours; the Winter Storm Watch will either up be upgraded to a Winter Weather Advisory or Winter Storm Warning – or canceled all together if conditions are not coming together for a winter weather event. The main difference between Winter Weather Advisories and Winter Storm Warnings is the amount of accumulating snow and/or mixed phase precipitation that is forecasted.

However, it is important to remember that regardless of whether a Winter Storm Warning or advisory is in effect, travel will likely be impacted. Remember, it doesn't always take a large snowfall event to make travel on roadways, especially overpasses, slick. Small amounts of snow, sometimes even refreezing of previously melted snow, can wreak havoc on travel especially during times of high volume traffic. For those of you who reside in the Wichita area, you may remember last winter when less than 1 inch of snow resulted in numerous accidents across the city resulting in a travel headache. Therefore, you should always use caution when traveling in the winter – even if minimal snowfall accumulations are expected. We always want you to stay safe by: trying to give yourself extra time to reach your destination, traveling at appropriate speeds for conditions, and giving additional space between you and other vehicles for extra stopping distances during the winter months.

Winter Storm Watch	**Highlights the potential for impactful wintry precipitation ~24-48 hours prior to the event**
Winter Weather Advisory	**2-5" of snow and/or mixed phase precipitation including ice, sleet, and freezing rain that will have moderate impacts**
Winter Storm Warning	**Snow ≥6" per event and/or mixed phase precipitation including ice, sleet, and freezing rain that will have moderate to significant impacts**
Blizzard Watch	**Conditions over the next ~24-48 hours look favorable for blizzard conditions (see Blizzard Warning)**
Blizzard Warning	**Visibility frequently < ¼ mile in snow and blowing snow with wind speed averages at or exceeding 35 mph for 3 hours or more**
Freezing Rain Advisory	**Ice accumulations < ¼"**
Ice Storm Warning	**Significant and possibly damaging accumulating ice, typically ≥ ¼"**
Wind Chill Advisory	**< -15°F with winds of at least 5 mph**
Wind Chill Warning	**≤ -25°F with winds of at least 5 mph**

Here are some snowfall statistics to get everyone ready for the Winter Season!

Wichita Snowfall Statistics	
Earliest measurable snow (≥0.1”)	Oct. 22, 1996
Average first measurable snow	Dec. 2
Average last measurable snow	Mar. 9
Latest measurable snow	Apr. 23, 2013
Earliest 1” snow	Oct. 28, 1905
Average first 1” snow	Dec. 18
Average last 1” snow	Feb. 18
Latest 1” snow	Apr. 18, 1997
When did Wichita see record snows?	
Snowiest season on record (Sept – May)	39.7” Winter 1911-1912
Snowiest month on record	21.2” in Feb. 2013
Snowiest day on record	12.0” on Jan. 18, 1962 12.0” on Mar. 9, 1909
Snowiest event	15.0” January 17-18th, 1962

YouTube

Be sure to find us by searching for

NWS Wichita

on YouTube

Cryptogram answer: Snow is only one of the many forms of winter precipitation. It is not uncommon to see freezing rain or sleet as well.

Spring-Summer 2015 Recap

By: Andy Kleinsasser

Thunderstorm Highlights:

April 2nd-3rd:

The Kansas region's first substantial severe thunderstorm event of 2015 hit during the late evening and early morning hours of April 2-3. Severe thunderstorms moved into Barton, Rice, and Reno counties during the evening of the 2nd producing golfball size hail and straight-line winds which snapped power lines and uprooted trees. The storms continued southeast into Harvey and Sedgwick counties producing significant wind damage in Newton and north Wichita (Figure 1). Winds were estimated around 100 mph. A hanger was destroyed at Jabara Airport, and 1/10 of a mile of power poles were snapped off at the base. Portions of Newton had roof and tree damage. A mobile home near Whitewater was destroyed, yet the whole family survived. Nearly 50,000 residences were without power across the area. The storms continued into southeast Kansas producing additional damaging winds and large hail.

Figure 1. Unanchored Mobile Home rolled 25ft near northeast Wichita due to very strong straight-line damaging winds around midnight April 3rd. Photo courtesy of NWS Wichita.

April 24th:

On April 24th, severe thunderstorms affected central and north-central Kansas during the late afternoon and evening hours primarily across Russell and Lincoln counties. A brief tornado was observed just southwest of Paradise in Russell County, along with golf ball size hail and 80 mph winds. North of the town of Russell, tennis ball size hail was observed along with 80 mph winds. The town of Lucas was next (Figure 2) when hail to the size of tennis balls scoured the community. In fact, local emergency management indicated that virtually every car and roof sustained significant hail damage across town, and the skylights in the middle school were blown out. The supercell continued east producing tennis ball size hail just north of Wilson in Lincoln County and 60 mph winds north of Ellsworth. Another brief tornado touched in Lincoln County near Sylvan Grove destroying the press box and damaging the roof of the local high school. This tornado was rated an EF1 with winds around 90 mph.

Figure 2. Hail covering the ground in Lucas due to severe thunderstorms during the evening hours on April 24th. Photo courtesy of Susie Martin.

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Also be sure to check if your county Emergency Manager has a Twitter account for your county.

May 6th:

During the late afternoon and evening hours of May 6th, strong to severe thunderstorms affected portions of central and south central Kansas mainly west of I-135. The first tornado (later rated an EF0) developed in Lincoln County about 7 miles southwest of Lincoln causing minor damage south and east of town. The strongest tornado of the day developed near Mount Hope (Figure 3) in northwest Sedgwick County tracking north through Harvey County. With estimated peak winds up to 150 mph, the tornado extensively dam-

Figure 3. May 6th tornado near Mount Hope. The twister inflicted EF3 damage to a farmstead. Photo courtesy of Jim Reed.

Figure 4. Flooding along the Cottonwood River near Florence due to several bouts of heavy rain across the region during the 2nd half of May.

aged a farmstead northeast of Mount Hope. The tornado crossed Highway 50 about 4 miles west of Halstead and continued tracking north toward Moundridge before dissipating.

May Flooding:

The month of May proved very wet across the region as multiple rounds of thunderstorms affected the area during mainly the 2nd half of the month. Many area streams and rivers were overwhelmed by the multiple deluges producing widespread flooding across primarily low-lying areas. (Figure 4)

Figure 5. The very picturesque Nickerson tornado on July 13th. Photo courtesy of Hans Mast.

Figure 6. EF3 tornado damage northeast of Nickerson on July 13th. Photo courtesy of NWS Wichita.

July 13th:
During the afternoon of July 13th, a supercell thunderstorm moved slowly and uncharacteristically south-southwest across Rice and northern Reno counties producing baseball size hail along with a tornado which began in rural areas of southeast Rice County and moved slowly southwest into Reno County, passing just east of Nickerson (Figure 5). The tornado, rated EF3 with winds of 150-165 mph, produced extensive damage to hardwood trees and destroyed a home just northeast of Nickerson (Figure 6). The tornado's maximum width was estimated at 350 yards with a path length of nearly 5.3 miles.

Figure 7. Wind damage at Lincoln Elementary in Great Bend due to severe thunderstorms during the evening hours on September 10th. Photo courtesy of KAKE TV.

Figure 8. Supercell thunderstorm west of Wilson, September 10th. Photo courtesy of Brandon Ivey.

September 10th:
The last substantial severe thunderstorm event of the year hit during the afternoon and evening hours of September 10th. A cluster of thunderstorms developed across southern Nebraska and northern Kansas, rapidly achieving severity as they moved southeast. The storms produced winds in excess of 80 mph along with hail larger than golfballs. The community of Great Bend was particularly hit hard by these storms, with Lincoln Elementary sustaining significant wind damage. (Figures 7 & 8)

A Detailed Look at Reporting Winter Weather Hazards

By: Jaclyn Ritzman and Chance Hayes—Meteorologists

Reporting Snowfall

To report by web at http://www.srh.noaa.gov/StormReport/SubmitReport.php?site=ict
To report via Twitter - @NWSWichita and #kswx

1. Call or tweet when snow starts and every few inches thereafter.
2. **Most Important - Call or tweet your final snowfall total.**

Make sure you avoid measuring in areas of drifted snow and on top of soft, grass locations as they can lead to overestimations of snowfall. Try and find a hard surface like a wood deck or cement that is somewhat sheltered from the wind. Once you find good locations to measure snow, not impacted by drifting, take multiple measurements and take the average to determine the snowfall amount.

For more information, please follow this link. Snow Measurement Guidelines or http://www.nws.noaa.gov/om/coop/reference/Snow_Measurement_Guidelines.pdf

Wichita, KS - Reporting Hotline

http://www.srh.noaa.gov/StormReport/SubmitReport.php?site=ict

Report

Time of Event
Event Type
Location of the Storm
Location of Yourself

NWSWichita
@NWSWichita
#kswx

www.weather.gov/wichita

Example: "I saw a tornado at 4:43pm approximately 2 miles south of my location, which is 4 miles NW of Winfield."

Hail Sizes	
0.75"	Penny
1.00"	Quarter
1.25"	Half Dollar
1.75"	Golf Ball
2.00"	Egg
2.50"	Tennis Ball
2.75"	Baseball
4.00"	Grapefruit

Tornadoes
Damaging Winds
Wall Cloud
Funnel Cloud
Hail
Flooding
Snow Totals
Ice Accumulation

Wind Reports	
> 58 MPH	Twigs & small limbs break off
58-72 MPH	Shingles damaged & large limbs broken
73-112 MPH	Roof damage, windows break, & trees uprooted
113+ MPH	Roofs torn off & trailer homes destroyed

When reporting, please report your location in reference to a town.

For example:

- I am in Russell and have 2 inches of snow on the ground.
- I am 6 miles south of Russell and have 4 inches of snow on the ground.

Reporting Sleet and Ice

1. Call or tweet when a glaze of ice begins to accumulate on trees and wires, or on roadways and walkways. Ice is extremely hazardous and sensitive to your local temperature. Reporting ice might save a life.
2. Call or tweet when ice accumulates to ¼ inch or more on trees and wires. Please continue to report every additional ¼ inch if possible.
3. ***Sleet*** is frozen rain or ice pellets. When it strikes the ground, it usually bounces. Sleet can accumulate like snow and cause slick roads. Measure sleet similarly to how you would measure snow.
4. Call or tweet the final thickness or depth of the ice on the trees or wires and sleet.

There may be a few other times you feel we may need to know what is happening in your area. Here are a few that we can think of, but remember, you are the one reporting and if you think that we need to know, please don't hesitate to call us.

1. If, for instance, the forecast is for flurries, but you now have a few inches on the ground, or instead of rain, it is now sleeting out.
2. In the rural areas, we have very little "ground-truth" data that tells us what precipitation type is falling or what is happening on the ground.
3. If you have an anemometer (measures wind speed) and it gusts to 50 mph or higher.
4. If high winds cause any damage such as trees or wires down, or damage to structures.
5. If it is snowing and you see lightning or hear thunder.
6. If it is snowing and the wind is gusting to 35 mph causing white out conditions.
7. If heavy drifting of snow is occurring and you can tell us the depth of the drifts.
8. How far in miles, yards, or feet can you see when dense fog is occurring.

2015 Cooperative Observer Awards

The following cooperative observers were presented Length of Service Awards in 2015. We would like to thank and congratulate our observers for volunteering their time in providing us with the climatic data which is published by the National Climatic Data Center on a monthly basis and made available to the private, public, and government entities. Their dedication to service is greatly appreciated!

Observer	Station	Years
Susan Thieme	Zenda	10
Doug Wilson	Lincoln 1 SE	10
Katherine Gibson	Goessel 2 NW	15
Michael Gillen	Willowdale 1 SW	20
Scott Gutsch	Lincolnville	20
Norma Jean Patton	Peabody	30
Darla Loyd	Sedan	30
Billie Heitzenrater	Beaumont	50

Welcome to our new Electronics Technician!

Dustin Baca is a new Electronic Technician that started working for the NWS on 4 May 2015. He was born in Hawaii and has lived a mobile life as a military brat until finally settling down in Mustang Oklahoma. He has a wife and a 13 year old daughter. Dustin has been in the Air Force reserves for 11 years and has worked there full time for 6 years as an electronics mechanic. In his free time he enjoys brewing beer, spending time with family and traveling.

RESERVE

National Weather Service

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Online: www.weather.gov/Wichita

NWS Wichita Winter Cryptogram

Answer on page 10

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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W A

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W A .

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