High Plains Wind

(Weather Information News Data)

July 6, 2011
Volume 5 Issue 2

National Weather Service, 920 Armory Road, Goodland, KS 67735
http://www.weather.gov/gld/ w-gld.webmaster@noaa.gov 785-899-7119

Inside This Issue

1 The 2011 Tornado Season
2 The Heat is On
4 From Tornado Drought…
6 Ever Wonder?
10 Low Level Jets?
14 Cooperative Observer News

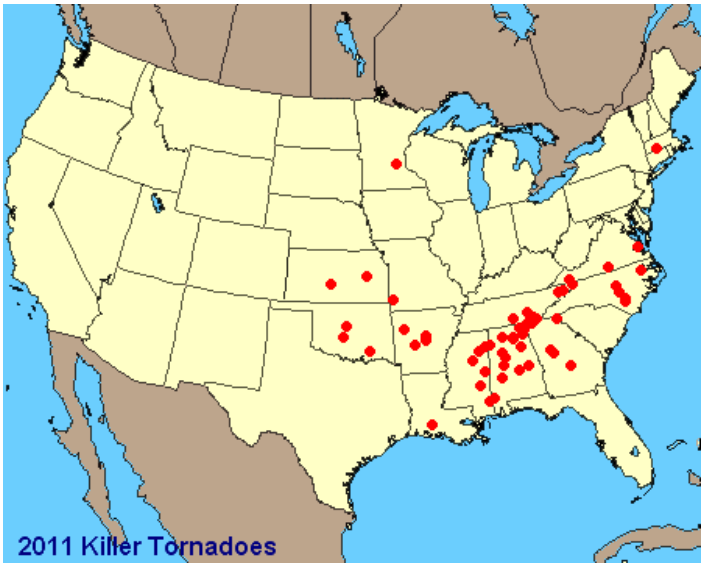
"Tornadoes have produced over 500 fatalities nationwide in 2011…"

A Message from the Meteorologist-in-Charge

By Scott A. Mentzer

The 2011 Tornado Season

Tuscaloosa. Hackleburg. Joplin. These communities and many more, all experienced destructive, life-changing tornadoes in the past two months. Closer to home, tornadoes produced a fatality in Reading, Kansas, and two fatalities northeast of Seward, Kansas. Tornadoes have produced over 500 fatalities nationwide in 2011, making it the deadliest season since 1953.



2011 Fatal Tornado Locations (Courtesy of the Storm Prediction Center)

Continued on page 12

The Heat is On…

-Chris Foltz, General Forecaster

Hot summer days are inevitable across the central High Plains. We've already had our fair share thus far in 2011. As we move into the heart of the summer season, it's a good time to be reminded of just how quickly heat can adversely impact those living here in the Tri-State region.

In an effort to help you plan ahead and prepare, your National Weather Service office in Goodland will issue a Heat Advisory when heat index values are expected to be near 105°F for any length of time. An Excessive Heat Warning is issued when heat index values are expected to approach 110°F for two or more consecutive days. Be sure to take time to check on friends and neighbors, especially the elderly, to ensure they are staying cool. Also, please take a few moments to review these safety tips.

Don't get too much sun. Sunburn makes the job of heat dissipation that much more difficult.

Slow down. Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily indoors.

Dress for summer. Lightweight light-colored clothing reflects heat and sunlight, and helps your body maintain normal temperatures.

continued on page 3

continued from page 2

Stay hydrated. Drink plenty of water or other non-alcohol fluids. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty.

Do not take salt tablets unless specified by a physician.

Spend more time in air-conditioned places. Air conditioning in homes and other buildings markedly reduces danger from the heat. If you cannot afford an air conditioner, spending some time each day (during hot weather) in an air conditioned environment affords some protection.

Do not drink alcoholic beverages.

For even more information please visit the following website:
http://www.weather.gov/om/heat/index.shtml

NWS Goodland Now on Facebook!!

Looking for another way to stay informed about the weather across the Tri-State area? If so, then be sure to check out the Facebook page for your NWS office in Goodland at the following link:

http://www.facebook.com/US.NationalWeatherService.Goodland.gov.

The use of Facebook will allow our office to reach out and be interactive on a regular basis. Best of all, this page is available for anyone to view even if you don't have a Facebook account.

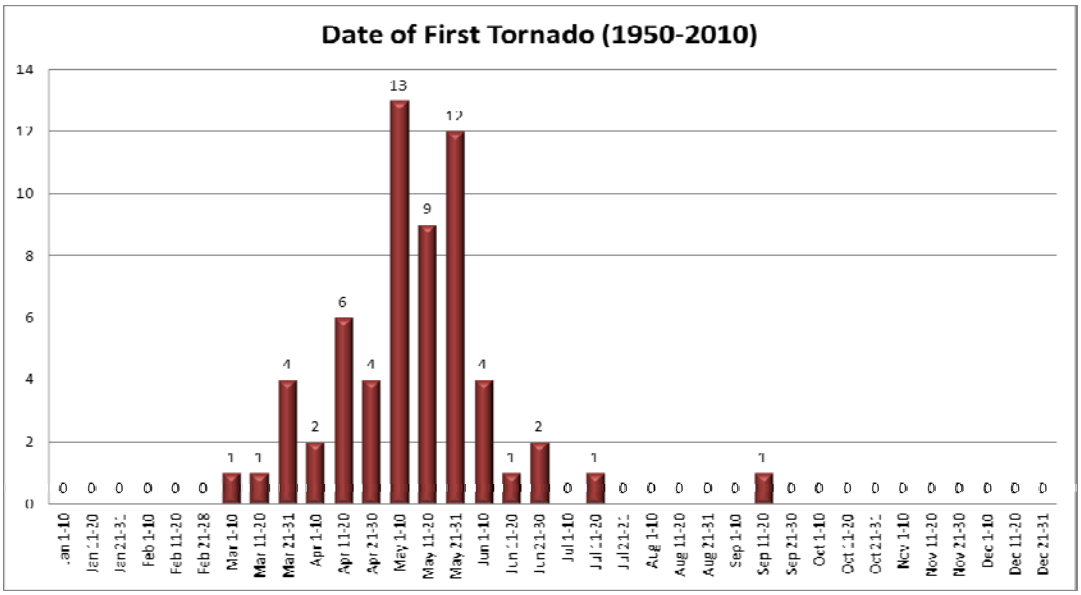
From Tornado Drought to Tornado Deluge

Dave Floyd, Warning Coordination Meteorologist

Each spring I receive the following question: "Will we have an active severe weather season?" I usually just fess up and say that I really don't know, and that was my response this year. The area received well below average snowfall last winter, due in large part to the ongoing, moderate strength La Nina. Typically, La Nina years translate to below average snowfall in western Kansas, southwest Nebraska and eastern Colorado. So, does a quiet winter imply fewer severe storms as we head into spring?

In some years, the winter weather pattern (location and strength of the jet stream) carries over into spring, but not always. One year which comes to mind is the winter of 2006-2007. The weather pattern was extremely active in December, January and February...record single-day snowfall, several ice storms, blizzard conditions and millions of dollars in property and livestock losses. When that pattern persisted into March and April, we experienced round after round of severe storms and tornadoes. In 2007, the first tornado of the year in our region occurred on March 24th, followed four days later by the highest single day tornado count on record with 16 tornadoes confirmed. At the end of 2007, the tornado count for the Tri-State region stood at 56...also a record.

In contrast to the spring of 2007, the 2011 severe weather season was slow to get underway. No confirmed tornadoes occurred in March, April or May. That fact prompted a look through the records to determine when we typically receive our first tornado report. The chart below is broken down into ten-day periods. The bars on the graph represent the number of years in our 61-year tornado record when the first tornado of the year occurred in that 10-day period. Sounds complicated, but it's really not. Look at the period May 1 to May 10 on the horizontal axis. The first tornado of the year occurred during that 10-day stretch in 13 years of our 61-year record. In contrast, in only four years of the 61-year record did the first tornado of the year occur in the March 21-31 time frame. Looking below, in most years the first tornado report comes by the end of May.



continued on page 5

continued from page 4

In 2011, the first confirmed tornado occurred June 18th in Cheyenne County, Colorado. Given the late start to the 2011 severe weather season, a natural follow-up question might be: "Does a late start to the severe weather season imply a slow severe weather season overall?" Apparently not! On June 19th, three confirmed tornadoes were reported in southwest Nebraska, and other damage in Yuma County suggests two more may have occurred. Then on June 20th, sixteen tornadoes developed, mostly in Norton and Graham counties, bringing this year's tornado count over 20, which is well above the average of 13.

The map below shows preliminary storm reports of tornadoes occurring between June 18th and June 20th from storm spotters, law enforcement, fire departments, storm chasers and the general public. Some of these are duplicate reports of the same tornado, and in the final summary, some tornadoes will likely be added.

The bottom line is this...on June 17th, the tornado count in the Tri-State area was zero, and three days later, thanks to one intense, slow-moving, weather system, the tornado count now stands around 22. Some of the tornadoes occurring on June 20th were strong (rated EF2 and EF3) and produced significant damage. Fortunately, no fatalities occurred, and only four minor injuries have been reported.

Ever Wonder?

By David Thede, Lead Forecaster

Ever wonder how much rain fell in your town or that of your relatives and friends? Maybe they wonder how much rain fell at your location. If you have an interest in weather and an interest in reporting rain, hail, snow, or any combination of the three, the National Weather Service in Goodland is promoting and establishing a supplemental rain, hail, and snowfall network in northwest Kansas, east central Colorado and southwest Nebraska. This opportunity is open to all interested volunteers that have an enthusiasm for watching and reporting weather conditions every day. This exciting opportunity is known as the Northwest Kansas CoCoRaHS Expansion and can be found on the internet at:

http://www.cocorahs.org/

CoCoRaHS is more than just a catchy name; it stands for Community Collaborative Rain, Hail, and Snow network. CoCoRaHS was established in 1998 by the Colorado State University and the Colorado State Climatologist's Office. Following years of success in the Denver and Fort Collins areas, the network has expanded to include every state in the country with over 10 thousand daily reports.

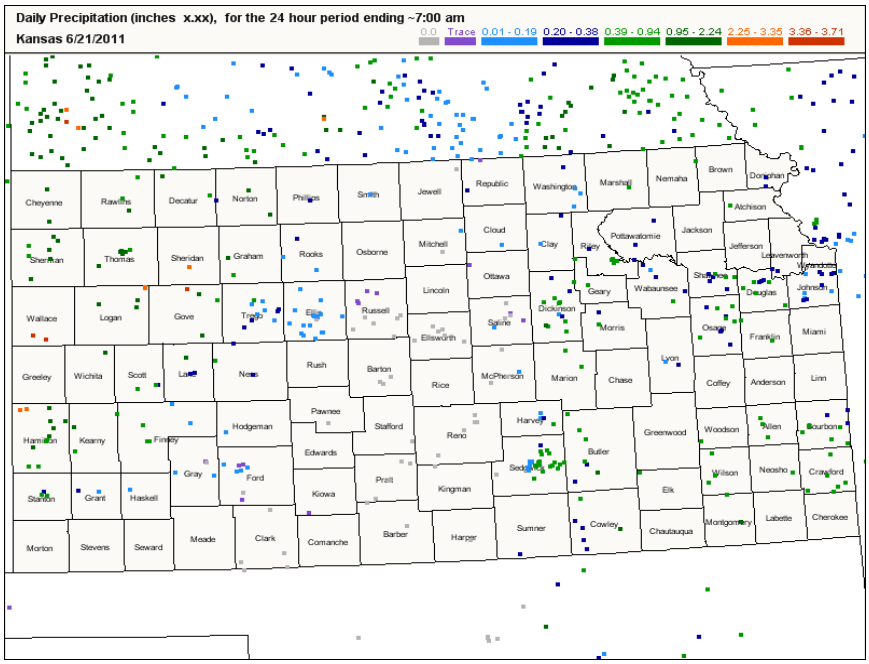
The network is composed of volunteers who are interested in the study of the fascinating and very complex patterns of rain, hail, and snow on the High Plains. Many volunteers are needed to accurately measure and describe rain and snowfall patterns as well as hail swaths on a daily basis. The data collected will benefit countless agencies and organizations within the fields of agriculture, public safety, and scientific research.

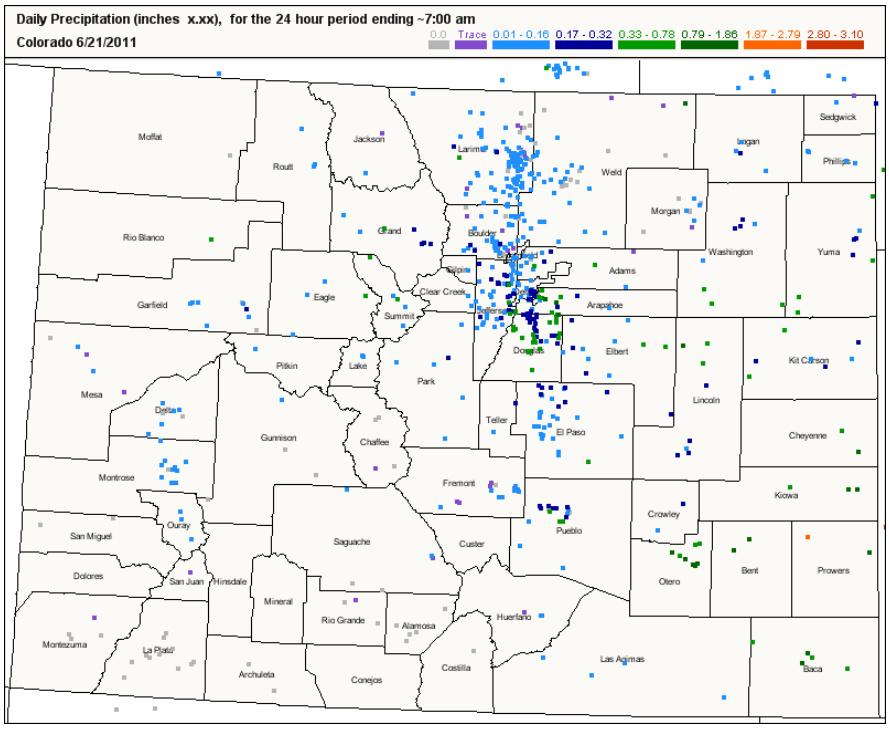
Interested volunteers should contact the Northwest Kansas/East Central Colorado and Southwest Nebraska CoCoRaHS Coordinator, David Thede of the National Weather Service in Goodland. He can be reached at (785) 899-7119 or at david.thede@noaa.gov.

continued on page 7

continued from page 6

Here are two maps from CoCoRaHS observers for 24 hour rainfall ending around 7 AM MDT Tuesday June 21 2011:





continued on page 8

continued from page 7

Here is the product we issue daily for the precipitation reports listed in our forecast area from the prior two maps above:

```
COCORAHS PRECIPITATION SUMMARY
NATIONAL WEATHER SERVICE GOODLAND KS
952 AM MDT TUE JUN 21 2011

COCORAHS PRECIPITATION REPORTS
THESE REPORTS ARE CONSIDERED SUPPLEMENTAL AND UNOFFICIAL
VALUES ARE FOR THE PREVIOUS 24 HOURS ENDING AROUND 7 AM LOCAL TIME

.B GLD 0621 M DH07/PP/SF/SD/SW
:
:COCORAHS PRECIPITATION REPORTS IN NORTHWEST KANSAS
:
:                                                  SNOW   SNOW  WATER
:                                          PCPN    FALL  DEPTH  EQUIV
:
KSWA04  : SHARON SPRINGS 10.0 SW   *   : 3.71 /  MM /   MM /   MM
KSWA01  : SHARON SPRINGS 10 S      *   : 3.45 /  MM /   MM /   MM
KSGO08  : GRAINFIELD 0.0 SSE       *   : 3.43 /  MM /   MM /   MM
KSSD02  : HOXIE 5.3 S              *   : 2.91 /  MM /   MM /   MM
KSLG10  : OAKLEY 0.3 NE            *   : 2.35 /  MM /   MM /   MM
KSLG05  : OAKLEY 0.1 NNE           *   : 2.26 /  MM /   MM /   MM
KSSH01  : GOODLAND 4.7 N           *   : 2.16 /  MM /   MM /   MM
KSDC03  : TRAER 2.5 NNW            *   : 1.94 /  MM /   MM /   MM
KSTH20  : LEVANT 6.9 SSW           *   : 1.59 /  MM /   MM /   MM
KSLG03  : OAKLEY 10.4 SSW          *   : 1.54 /  MM /   MM /   MM
KSSH02  : GOODLAND 11 NNE          *   : 1.54 /  MM /   MM /   MM
KSSH04  : GOODLAND 0.5 ENE         *   : 1.48 / 0.0 /  0.0 / 0.00
KSSH14  : GOODLAND 13.2 SW         *   : 1.48 /  MM /   MM /   MM
KSSH03  : GOODLAND 0.5 ENE         *   : 1.44 /  MM /   MM /   MM
KSSH17  : GOODLAND 12.0 N          *   : 1.31 / 0.0 /  0.0 /   MM
KSGO07  : PARK 2.8 S               *   : 1.31 /  MM /   MM /   MM
KSLG02  : WINONA 3.7 SSW           *   : 1.25 /  MM /   MM /   MM
KSGH03  : MORLAND 1.0 SW           *   : 1.23 /  MM /   MM /   MM
KSTH18  : COLBY 0.6 NNW            *   : 1.13 /  MM /   MM /   MM
KSTH11  : COLBY 0.1 NNE            *   : 1.11 /  MM /   MM /   MM
KSRA17  : ATWOOD 8SSE              *   : 1.10 /  MM /   MM /   MM
KSTH24  : COLBY 0.2 SE             *   : 1.10 /  MM /   MM /   MM
KSTH13  : COLBY 1.6 NNW            *   : 1.07 /  MM /   MM /   MM
KSCN07  : ST. FRANCIS 8.6 NNE      *   : 1.05 /  MM /   MM /   MM
KSNT03  : NORTON 0.4 N             *   : 1.03 /  MM /   MM /   MM
KSTH09  : COLBY 1.0 NNE            *   : 1.00 /  MM /   MM /   MM
KSCN03  : SAINT FRANCIS 10.3 SSE   *   : 0.98 /  MM /   MM /   MM
KSNT01  : LENORA 16.7 E            *   : 0.96 /  MM /   MM /   MM
KSSH21  : GOODLAND 12.1 NW         *   : 0.94 /  MM /   MM /   MM
KSSH16  : GOODLAND 10.3 WNW        *   : 0.87 /  MM /   MM /   MM
KSTH25  : COLBY 2.0 ENE            *   : 0.80 /  MM /   MM /   MM
KSGH01  : MORLAND 9.7 S            *   : 0.71 /  MM /   MM /   MM
KSDC01  : NORCATUR 3.1 WSW         *   : 0.65 /  MM /   MM /   MM
KSGO09  : QUINTER 3.3 SSE          *   : 0.45 /  MM /   MM /   MM
:
```

continued on page 9

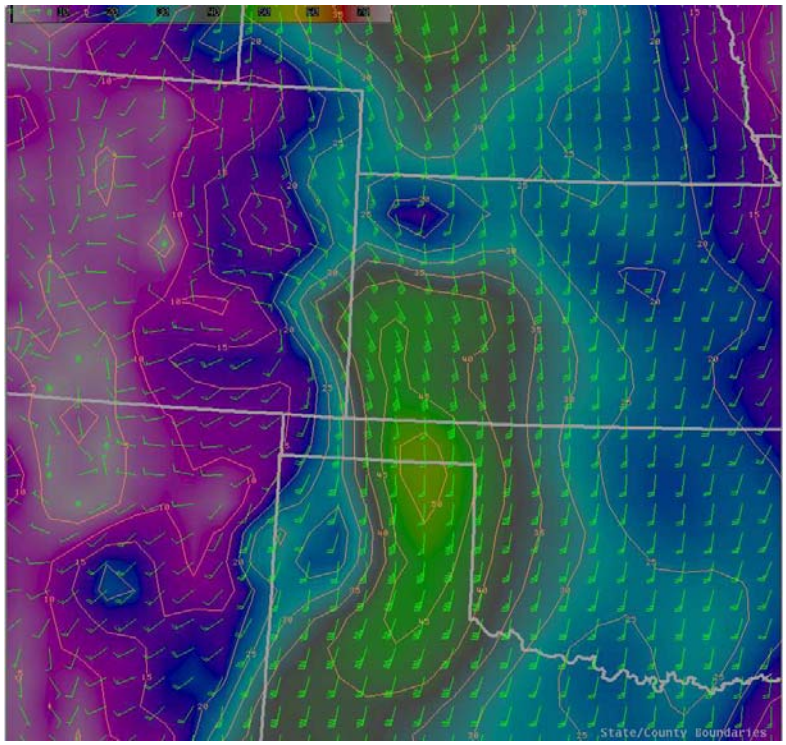
continued from page 8

```
:COCORAHS PRECIPITATION REPORTS IN EASTERN COLORADO
:
:                                                  SNOW   SNOW  WATER
:                                          PCPN    FALL  DEPTH  EQUIV
:
COCH21  : CHEYENNE WELLS 10.8 SE   *   : 1.03 /  MM /   MM /   MM
COCH28  : CHEYENNE WELLS 1.6 N     *   : 0.64 /  MM /   MM /   MM
COYU73  : JOES 3.2 SSW             *   : 0.42 /  MM /   MM /   MM
COKC81  : FLAGLER 7.2 SSW          *   : 0.35 /  MM /   MM /   MM
COYU24  : LIBERTY 5.5 NW           *   : 0.34 /  MM /   MM /   MM
COKC80  : BURLINGTON 8.4  NNE      *   : 0.24 /  MM /   MM /   MM
COYU61  : WRAY 0.2 N               *   : 0.22 /  MM /   MM /   MM
COKC123 : STRATTON 0.1 N           *   : 0.16 /  MM /   MM /   MM
COKC27  : BURLINGTON 0.58 NE       *   : 0.15 /  MM /   MM /   MM
COYU68  : WRAY 4.2 NNE             *   : 0.11 /  MM /   MM /   MM
:
:NERAIN/COCORAHS PRECIPITATION REPORTS IN SOUTHWEST NEBRASKA
:
:                                                  SNOW   SNOW  WATER
:                                          PCPN    FALL  DEPTH  EQUIV
:
DUND015   : WAUNETA 6.5 S            *   : 2.66 / 0.0 /   MM /   MM
DUND020   : WAUNETA 5.8 S            *   : 2.18 / 0.0 /   MM /   MM
RED006    : BARTLEY 9.8 SSE          *   : 1.67 / 0.0 /   MM /   MM
DUND005   : MAX 4.4 NNE              *   : 1.66 / 0.0 /   MM /   MM
HITC022   : STRATTON 7.9 NNW         *   : 1.40 / 0.0 /   MM /   MM
DUND001   : BENKELMAN 0.3 NNW        *   : 1.34 / 0.0 /   MM /   MM
DUND009   : PARKS 16.4 N             *   : 1.32 / 0.0 /   MM /   MM
DUND019   : BENKELMAN 4.9 NW         *   : 1.30 / 0.0 /   MM /   MM
RED001    : MCCOOK 5.4 SW            *   : 1.28 / 0.0 /   MM /   MM
HITC004   : CULBERTSON 10.1 SSE      *   : 1.20 / 0.0 /   MM /   MM
DUND017   : HAIGLER 9.5 NNE          *   : 1.04 / 0.0 /   MM /   MM
RED009    : BARTLEY 6.0 SSE          *   : 1.04 / 0.0 /   MM /   MM
DUND010   : PARKS 6.0 NW             *   : 0.99 / 0.0 /   MM /   MM
HITC020   : PALISADE 2.4 WSW         *   : 0.97 / 0.0 /   MM /   MM
DUND008   : HAIGLER 21.1 NNE         *   : 0.96 / 0.0 /   MM /   MM
RED011    : MCCOOK 12.8 SSE          *   : 0.92 / 0.0 /   MM /   MM
RED005    : INDIANOLA 2.2 NW         *   : 0.63 / 0.0 /   MM /   MM
HITC005   : TRENTON 0.5 NNE          *   : 0.48 / 0.0 /   MM /   MM
RED019    : MCCOOK 4.6 NNW           *   : 0.47 / 0.0 /   MM /   MM
HITC017   : PALISADE 6.1 ESE         *   : 0.45 / 0.0 /   MM /   MM
RED015    : CAMBRIDGE 3.5 N          *   : 0.05 / 0.0 /   MM /   MM
:
.END

$$
```

Low Level Jets

By Christopher Shaffer, Meteorologist Intern



A low level jet (LLJ) is an area of particularly high wind speeds relatively close to Earth's surface that can have a variety of impacts on weather and our region. Though LLJs are found all around the world and can be formed many different ways, we commonly see one type of LLJ in our part of the world. The LLJ forms overnight as surface temperatures cool over the higher terrain to our west and lower terrain to our east, causing a strong southerly wind over the region. An example of this jet, as forecasted by the Global Forecast System (GFS), can be seen in green in the above image.

continued on page 11

continued from page 8

Low level jets can play a role in thunderstorm formation and severe weather events in a few ways. LLJs can transport Gulf of Mexico moisture northward into the region, providing an important ingredient in storm formation. The "nose" of the jet (the northernmost part) forces air out of its way and upward. This upward motion is another key ingredient in forming storms. Also, a LLJ causes a drastic increase in wind speed with height, and this wind shear may allow storms to organize and become severe.

Even if conditions aren't right for thunderstorms, the LLJ can still impact the aviation community. The increase in wind speed within a relatively shallow layer above the surface makes landing planes and taking to the skies dangerous, so LLJs near airports need to be forecasted and monitored. Aviation forecasts take into account the low level wind shear when a LLJ is expected, describing the wind speed at a height several hundred feet above the surface.

Photo by Brock Hammond, June 20, 2011

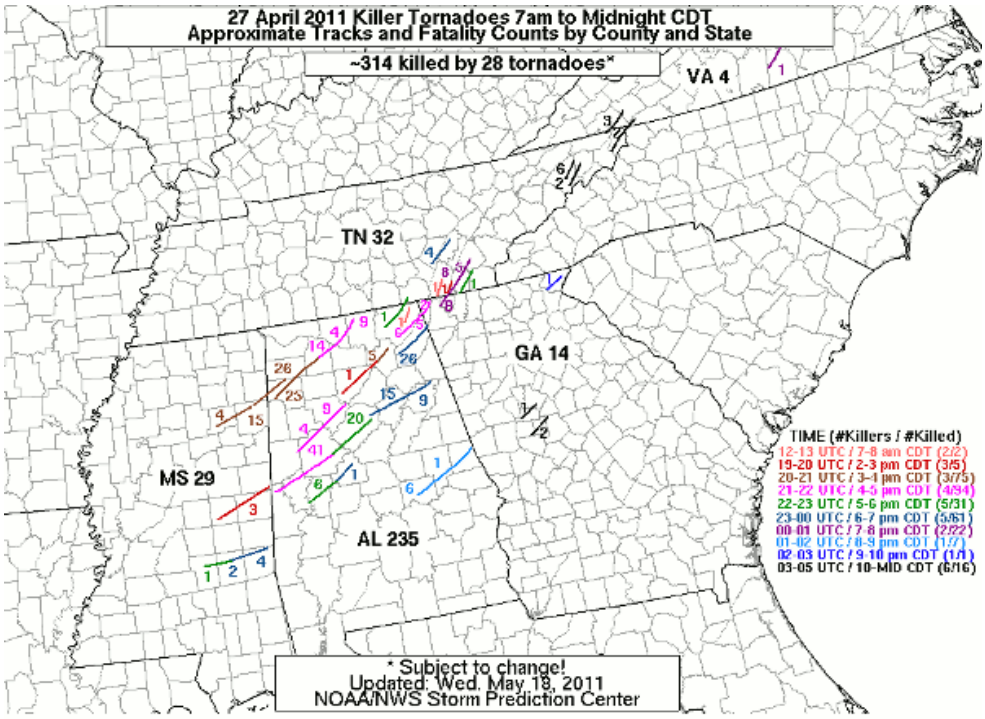
Thanks to all the spotters who provided information, photos and videos during the recent storms in our area. Your help is greatly appreciated. Be sure to report from a safe place – your safety is our number one concern!

continued from page 1

The EF-5 rated tornado in Joplin, Missouri, killed 141 people on May 22, 2011, making it the deadliest single tornado since modern recordkeeping began in 1950. It is ranked 8th among the deadliest tornadoes in U.S. history. The April 26-28, 2011, tornado outbreak killed over 300 people in the southeast part of the country. Although 1,400 tornadoes have occurred nationwide so far this year, the tornado season across the Tri-State area started slowly (see Dave Floyd's article elsewhere in this newsletter). However, this abruptly changed on June 20, when over 15 tornadoes developed across Norton and Graham Counties.

Why have there been so many deaths this tornado season? Tornado warnings during the events were excellent. For example, the warning lead time (the amount of time between the issuance of the warning and tornado development) was over 20 minutes at Joplin. Yet, over one hundred people lost their lives.

During the past 20 years, National Weather Service (NWS) meteorologists have increased their understanding about how tornadoes form. New technology, including the development of sophisticated atmospheric models, help meteorologists determine days when tornado potential is high. Positive communication between the NWS and its partners in the media and the emergency management communities has increased. All of these factors contribute to increased warning lead time.



Tornado Tracks from the April 27, 2011, Outbreak (Courtesy of the Storm Prediction Center)

continued on page 13

continued from page 12

Advanced warning means little, however, if people fail to take action to protect themselves, their families, and their friends. The NWS, researchers, media, and emergency managers will review these storms in detail, and not just from a meteorological view point. Are there better ways to convey levels of threat so that people take warnings more seriously? How can meteorologists use social media to advise people about threatening weather? What constitutes a good warning anyway? All of these non-meteorological questions will be examined by experts, including social scientists, in the coming months and years.

In the meantime, I always stress to folks to take all of the NWS warnings seriously. When we issue a warning, we either have confirmation that a serious weather event is occurring or have high confidence that an event will occur shortly. If we issue a tornado warning for your community, take the warning seriously and follow your safety plan. Tornado safety rules are found elsewhere in this newsletter.

Planning a visit to Goodland? We welcome visitors and tours. Please call to schedule, especially during the summer months, as severe weather often keeps us very busy!

Don't forget to keep your weather radio handy during the severe weather season. If you need help to program your radio, check out this website:

http://www.weather.gov/nwr/

Cooperative Observer News

by Mike Lammers, OPL

Pictured at left is Amanda Franklin. She reports from 8 SSE of Atwood, Kansas. She was recently presented with a 15 year length of service award.

Pictured at right is Kathy Woodcox. She reports from St. Francis, Kansas. She was recently presented with a 15 year length of service award.

continued on page 11

continued from page 14

Pictured at right are Tom and Bonnie Horobik of Benkelman, Nebraska. They received an award for reporting to us for 20 years.

Patricia Hackert, left, of Palisade, Nebraska, recently received an award for reporting for 25 years.

National Weather Service
920 Armory Road
Goodland, KS 67735

Phone:
785-899-7119

Fax:
785-899-3501

E-mail:
w-gld.webmaster@noaa.gov

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community. It is accomplished by providing warnings and forecasts of hazardous weather, including thunderstorms, flooding, hurricanes, tornadoes, winter weather, tsunamis, and climate events. The NWS is the sole United States OFFICIAL voice for issuing warnings during life-threatening weather situations.

Please don't forget, if you have pictures or video to share of any severe weather events that take place this year, please contact ***david.l.floyd@noaa.gov***

With your permission, your pictures and video will provide information and training materials for future storm spotters and meteorologists!