

Weather Home Companion



Volume 6 Issue 1

Spring/Summer 2009

INSIDE THIS ISSUE:

<i>New One Inch Hail Criteria for Severe Thunderstorm Warnings</i>	1
<i>Introducing the Grassland Fire Danger Index</i>	1
<i>Remembering the Flood of 2008</i>	3
<i>July 21, 2008 Derecho</i>	3
<i>2008 Severe Weather Warning Verification</i>	4
<i>The 2008-09 Winter in Review</i>	5
<i>Tornado Safety Rules</i>	7

Weather Home Companion is a semiannual publication of the National Weather Service office in the Quad Cities.

If you have an idea for an article or a question you would like to see answered, please write to us.

Contact information can be found on page 8.

New One Inch Hail Criteria for Severe Thunderstorm Warnings

Mike McClure

On April 1, 2009, the hail criterion for National Weather Service severe thunderstorm warnings in Iowa, Illinois and Missouri, changed. The new minimum hail size for a thunderstorm to be considered severe was raised to one inch in diameter, or the size of a quarter. Previously, the minimum hail criterion was three-quarters of an inch, or penny sized. No change will occur with respect to wind speeds. The wind criterion for severe thunderstorm warnings will remain the same at 58 mph (50 knots) or greater.

partners shared concerns that the public was becoming desensitized by numerous warnings issued for marginal hail sizes.



The National Weather Service will issue Special Weather Statements for strong thunderstorms expected to produce hail in the range of one half to just less than 1 inch in diameter and/or winds of 40 to 57 mph.

Why Change?

The basis for the change is two-fold: 1) Studies have shown that significant property damage rarely occurs with hail less than one inch in diameter; and 2) core National Weather Service

The Bottom Line...

With this new criterion, there will be fewer severe thunderstorm warnings. When warnings are issued, they will be warning for storms that will have greater potential to cause damage. As always, if you receive hail of any size, please call the National Weather Service.

Introducing the Grassland Fire Danger Index (GFDI)

Jim Hladik

The Grassland Fire Danger Index, or GFDI, is an experimental index originally developed in Australia that has been adapted for use in the United States. Its purpose is to quantify the potential for grass fires to become difficult to contain. It was implemented by the National Weather Service in the Quad Cities this spring.

The GFDI is essentially a much improved version of the Rangeland Fire Danger Index (RFDI) that is currently used by many NWS offices to assess fire threat. It incorporates wind, tem-



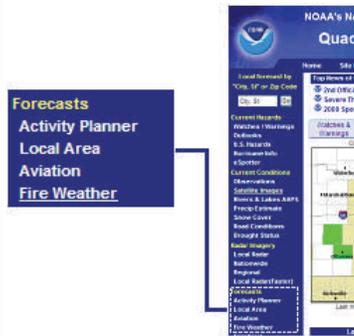
An official from Port Louisa National Wildlife Refuge ignites tall grass as part of a prescribed burn. Photographed April 2002.

perature, humidity, and the state of the vegetation into a calculation, rating conditions on a scale from low to extreme. When the GFDI reaches the very high or

(Continued on page 2)

Where to find the Grassland Fire Index:

1. Go to our website www.crh.noaa.gov/dvn
2. From the homepage, select **Fire Weather**, under **Forecasts in the left margin**.



3. Select **Grassland Fire Danger Statement**, under **Quad City Area Information**.
4. You will then see a text product similar to the example on the right.

Introducing the Grassland Fire Danger Index (GDFI)

(continued from page 1)

extreme category, it will be advertised in the Hazardous Weather Outlook.

Very High

A very high GDFI means fires will start easily from all causes and spread quickly. Fire control will be very difficult and require extended effort. Outdoor burning is not recommended and should be avoided.

Extreme

An extreme GDFI means fires will start and spread rapidly with the potential to become large.

You can expect extreme and erratic fire behavior. No outdoor burning should take place.

The GDFI will also be issued daily in a tabular text format in the fire weather section of the NWS Quad Cities web page. This provides the current and forecast GDFI category (see further information in the left margin). Instead of having to guess whether dry or windy conditions will produce an enhanced fire danger, state and county officials will now be able to use this scientifically based index. Fire departments will also be able to use the GDFI for advanced planning of when they

may become busy fighting grass fires.

Fuel Assessment

Besides wind, studies have shown that the most critical element of the GDFI and grass fire behavior is the extent of curing of the vegetation. This “curing” is a measurement of the relative dryness of grasses and weeds, which is critical to the rate at which fires will develop and spread.

To assess this important ingredient of the GDFI, a vegetation observation network has been established across portions of eastern Iowa, northeast Missouri and northwest Illinois. These voluntary observers have been supplied a Grassland Curing Guide developed for the local area. This helps them assess the state of the vegetation during climatologically set times of the year when there are normally abundant dry fuels available. These seasonal periods have been recognized generally to occur from the middle of February through mid May, and October through November. These observers will call in their reports weekly to the NWS during these periods, and also during other periods of excessive dryness brought on, for example, by extended drought.

The NWS Quad Cities is still looking to add volunteers to the initial set of vegetation observers, especially in areas that currently have sparse coverage. The NWS Quad Cities is looking forward to providing this new service and measurement of grassland fire danger in 2009!



GRASSLAND FIRE DANGER INDEX - * EXPERIMENTAL *****
NATIONAL WEATHER SERVICE QUAD CITIES IA/IL
333 AM CDT TUE MAR 24 2009

THE GDFI DOES NOT ACCOUNT FOR PRECIPITATION THAT OCCURS WITHIN THE HOUR PRECEDING ANY GIVEN FORECAST HOUR BELOW OR ANY SNOW ON THE GROUND AT THE FORECAST HOUR. PLEASE MAKE APPROPRIATE ADJUSTMENTS.

GDFI SCALE:

(L) LOW	0 TO 2
(M) MODERATE	3 TO 7
(H) HIGH	8 TO 19
(V) VERY HIGH	20 TO 49
(X) EXTREME	50+
(-) MISSING	

**IAZ040-250245-
 BUCHANAN-
 INCLUDING THE CITY OF...INDEPENDENCE**
333 AM CDT TUE MAR 24 2009

(ALL TIME REFERENCES ARE IN CDT)

DAY/DATE	24HR INDEX	*	1AM	4AM	7AM	10AM	1PM	4PM	7PM	10PM
TUE MAR 24	HIGH	16	* H	H	H	H	H	M	M	M
WED MAR 25	HIGH	11	* M	M	M	H	H	H	M	M
THU MAR 26	LOW	2	* L	L	L	L	L	L	L	L

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**IAZ041-250245-
 DELAWARE-
 INCLUDING THE CITY OF...MANCHESTER**
333 AM CDT TUE MAR 24 2009

(ALL TIME REFERENCES ARE IN CDT)

DAY/DATE	24HR INDEX	*	1AM	4AM	7AM	10AM	1PM	4PM	7PM	10PM
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Answers to tornado quiz questions on page 7

- 1) 1000
- 2) 1%
- 3) 60
- 4) 5 pm
- 5) May

Remembering the Flood of 2008

Maren Stoflet

As we enter the active weather season that spring often brings, vivid recollections remain rather fresh in the minds of those impacted by the record and historic flooding of 2008. The one year anniversary of the unprecedented May and June flooding of 2008 will come and go, but the effect on so many communities will remain well into the future.



Flooding of the Cedar River in Cedar Rapids, Iowa, June 13, 2008. The downtown area and I-380 bridge can be seen in the upper right. (Photo Credit: Iowa Department of Homeland Security and Emergency Management)

Record Crests

During June of 2008, record crests were set at all river forecast points on the Cedar and Iowa Rivers, as well as on other tributary rivers to the Mississippi River in eastern Iowa. Three locations on the Mississippi River downstream of New Boston, IL Lock and Dam 17 also set new record crests in June of 2008.

Future Floods

The chances of having the magnitude of flooding that was experienced in the spring of 2008 are

rather low in any given year, but last year is a reminder that those chances can be realized. It is also important to be aware that flooding is a 'normal' occurrence. However, the 'normal' percentage of risk varies from river to river, and from one location on a river to the next.

We hope not to experience the mag-

nitude of flooding that occurred in 2008 again, but you should know that the National Weather Service will always strive to provide the best river forecasts and flood warnings possible.

For the latest river forecast and warning information, go to www.weather.gov/ahps.

...During June of 2008, record crests were set at all river forecast points on the Cedar and Iowa Rivers...

July 21, 2008 Derecho

Andy Ervin

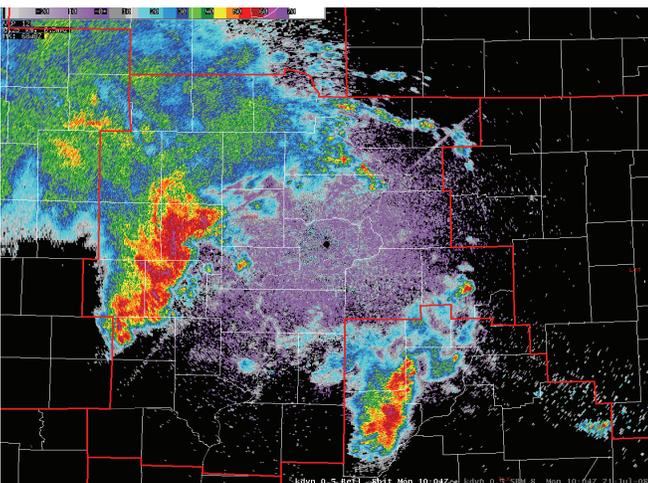


Image from NWS Quad Cities Doppler radar from 5:47 am CDT, July 21, 2008. This was about 25 minutes before damaging winds reached the Quad Cities. At this time, 60 to 70 mph winds and widespread tree damage was occurring in Muscatine, Iowa.

Shortly after midnight on July 21, 2008, a severe convective windstorm, known as a derecho, developed over northeast Nebraska. The derecho raced across eastern Iowa and northwest Illinois during the early morning hours, and continued into northern Indiana before dissipating, producing widespread wind damage along a nearly 500 mile long path.

In the Davenport National Weather Service County Warning Area, this derecho was characterized by a single bow echo producing a 40 to 60 mile wide swath of significant wind damage comprised largely of trees and power lines. Power was knocked out to over 130,000 residents in the Quad Cities, and some people were without power for over a week. Two children and a

What is a Derecho?

A derecho (pronounced similar to "deh-REY-cho" in English) is a widespread and long lived windstorm that is associated with a band of rapidly moving showers or thunderstorms.

What is the origin of the word Derecho?

The word "derecho" was coined by Dr. Gustavus Hinrichs, a physics professor at the University of Iowa, in a paper published in the American Meteorological Journal in 1888.

Source: NWS SPC (Storm Prediction Center)

www.spc.noaa.gov/misc/AbtDerechos/derechofacts.htm

(Continued on page 4)

2008 Severe Weather Warning Verification

Steve Kuhl

The mission of the National Weather Service (NWS) is to “protect life and property and enhance the national economy.” To accomplish this mission, your NWS Quad Cities Forecast Office issues severe weather warnings for a 36 county warning service area covering most of eastern Iowa, northwestern Illinois, and extreme northeastern Missouri.

2008 was certainly a memorable weather year. The record breaking snows of last winter, the devastating floods during April, May and June, and the damage from the high wind storm during July, will not soon be forgotten by those of us who experienced nature’s fury.

Tornadoes

During 2008, the NWS Quad Cities Office issued 41 tornado

warnings. Fifty eight percent were verified correct, with tornadoes occurring inside warned areas. The average lead time, or the amount of time from when a tornado warning was issued to when the actual tornado occurred, was 14 minutes. This was 3 minutes longer than the NWS national goal of 11 minutes.

Flash Floods

The NWS Quad Cities issued 73 flash flood warnings in 2008. Of those, sixty five percent were verified correct with an average lead time of 64 minutes. This is 15 minutes longer than the NWS national goal of 49 minutes.

Severe Thunderstorms

The NWS Quad Cities issued 285 severe thunderstorm warnings in 2008. Seventy eight percent of these verified correct with an average lead time of 19 minutes.

Winter Storms

For winter storm warnings, sixty eight percent of those issued verified as correct with an average lead time of 17.4 hours. This lead time exceeded the NWS 15 hour national goal by 2.4 hours.

As Meteorologist in Charge of the NWS Quad Cities Office, I can assure you our staff of professional meteorologists and technicians will continue to watch the skies and issue severe weather warnings whenever hazardous weather conditions threaten the area. We will steadfastly strive to increase our severe weather warning accuracy, and work harder than ever to accomplish the NWS mission to protect the lives and property of the citizens we are proud to serve.

...The mission of the NWS is to “protect life and property and enhance the national economy.” ...

	Number of Warnings Issued	Percent Correct	Lead Time	National Lead Time Goal
Tornadoes:	41	58	14 minutes	11 minutes
Flash Floods:	73	65	64 minutes	49 minutes
Severe Thunderstorms:	285	78	19 minutes	N/A
Winter Storms (2007-08 Season):	269	68	17.4 hours	15 hours

July 21, 2008 Derecho

(continued from page 3)

dog were killed, and 4 other children were injured when a tree fell onto a tent at a campground in Colona, Illinois.

Radar estimated velocities were in the 80-100 knot (92-115 mph) range along the leading edge of the bow echo, and a National

Weather Service survey team found damage consistent with peak wind gusts near 80 knots, or 92 mph. The Automated Surface Observing System (ASOS) at the Quad City International Airport in Moline, Illinois registered a peak wind gust of 70 knots (81 mph) before losing power. The airport had a backup Coastal Observing System that

recorded a peak wind gust of 82 knots (94 mph).

Despite the magnitude of the derecho, no tornadoes were reported within the Quad Cities National Weather Service area of responsibility.

...National Weather Service survey team found damage consistent with wind gusts near 92 mph...

The 2008-09 Winter in Review

John Haase

Overview

The winter of 2008-09 was very active through December and January, reminiscent of the previous winter, but then quickly faded and was rather uneventful through the remainder of the season.

There was only one snow storm in February, one in March, and a minor snow event in early April. For the entire winter, there were a total of 21 separate winter precipitation events that required headlines (winter weather advisories, watches or warnings) from the National Weather Service, compared to 23 events in the 2007-08 winter season.

Seasonal snowfall totals ranged from about 35 to nearly 55 inches across east central Iowa and northwest Illinois. Totals across southeast Iowa, western Illinois and extreme northeast Missouri were roughly in the range from 15 to 30 inches. These amounts were about 5 to 12 inches *above* normal, but well below last winter's totals. Recall that during the 2007-08 winter season, snowfall totals ranged from 40 to 80 inches across the region. The official observing sites in the NWS Quad Cities service area that had the most snow this winter were Dubuque, Iowa and Stockton, Illinois (Jo Daviess county) with about 53 inches.

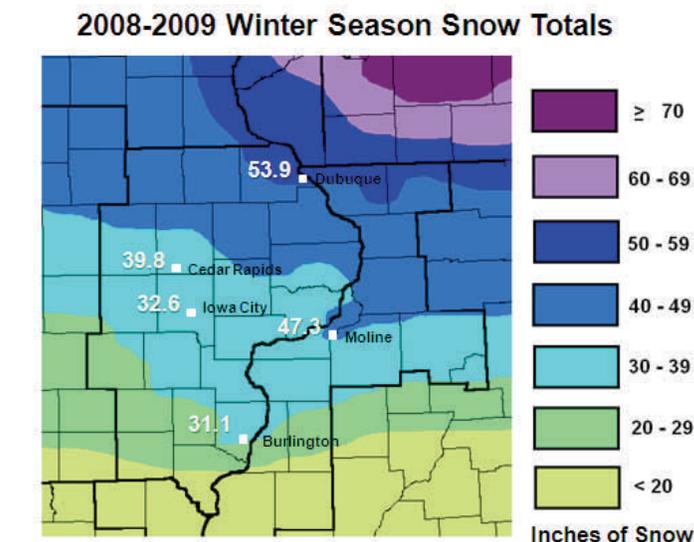
Highlights:

November

Low pressure tracked from Missouri to the Great Lakes region on November 29-30, 2008. This was the first snowfall of the winter season resulting in widespread accumulations of 2 to 4 inches.

December

On December 8, 2008, a warm front lifting northward out of Missouri triggered a band of freezing rain just north of the front. The freezing rain only lasted about an



Winter season snowfall totals for November 2008 through April 2009.

hour or two during the morning and early afternoon hours. However, surface temperatures were in the mid to upper 20s, resulting in a quick glazing of ice on roads and highways. There were dozens of vehicle accidents with mainly minor injuries. Local hospitals also reported some injuries from people falling on the ice.

An intense arctic cold front tracked across eastern Iowa and western Illinois on December 14th. The passage of this front caused an incredible temperature drop of 50 degrees or more over about a 12 hour period. Afternoon temperatures that were in the 50s, fell into the single digits and even several degrees below zero by late in the evening. To make matters worse, thunderstorms producing heavy sleet developed in the early evening hours just behind the arctic front. These storms erupted from the Quad Cities to Burlington with sleet accumulations of 1/2 to 1 inch in less than 2 hours.

On December 18th and 19th, a major winter storm tracked from eastern Colorado across northern Missouri into central Illinois, producing the most significant winter event of the month. Heavy

snow accumulations of 6 to 10 inches were widespread across northeast Iowa and northwest Illinois, mainly north of Highway 30. Roughly along the Interstate 80 corridor, 2 to 4 inches of sleet and up to 1/2 inch ice accumulations were reported. Locations south of Interstate 80 in southeast Iowa, western Illinois and northeast Missouri experienced a major ice storm. Ice accumulations of 1/4 to nearly 1 inch were common, with many trees and branches down due to the weight of the ice. Scattered thunderstorms also developed, helping to produce the heavy precipitation amounts. Power outages of up to a week occurred, especially in western Illinois, due to the ice storm.

A powerful arctic cold front swept across the region on December 20th and 21st. Ahead of the front, 1 to 3 inches of fluffy snow fell during the afternoon of the 20th. The snow was confined to locations along and north of Interstate 80 in Iowa and Illinois. By evening, the depth of snow on the ground north of highway 34 ranged from 5 to 12 inches. The passing arctic cold front was followed by northwest winds from

(Continued on page 6)

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...Recall that during the 2007-08 winter season, snowfall totals ranged from 40 to 80 inches...

The 2008-09 Winter in Review

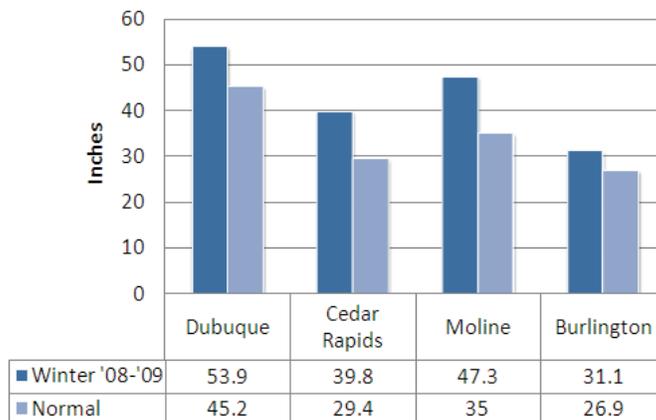
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...on January 15th, an all time record low temperature of -29 was established at Cedar Rapids...

4 inches at Burlington to 15 inches in Cedar Rapids. Most snow depths were in the 6 to 12 inch range across eastern Iowa and northwest Illinois.

The deep snow cover set the stage for a strong surge of arctic air that brought record cold temperatures to the region on the 14th through 16th. In fact, on the 15th, an all-time record low temperature was established at Cedar Rapids when the mercury dropped to 29 below zero. Actual readings were as low as -20 to -40 degrees north of Highway 34 with -10 to -20 south of Highway 34. Bone-chilling wind chills as low as 50 below zero were noted over much of the region.

Seasonal Snowfall 2008-2009



20 to 35 mph with gusts to 45 mph late in the evening of the 20th through the day on the 21st. This combination of deep snow and strong winds created ground blizzard conditions with frequent whiteouts reducing visibilities to less than a quarter mile, especially in rural and open areas. Some drifts on highways were as high as 6 feet. With temperatures below zero, wind chill readings were as low as 30 to 40 below zero. The combination of blizzard conditions and very cold temperatures made for a dangerous situation.

inside the garage at the time was uninjured.

January

A storm system on January 9-10, 2009 dumped 5 to 9 inches of snow across northeast Iowa and northwest Illinois, north of Interstate 80. This was followed by another snowstorm on the 13th and 14th, which brought widespread 4 to 8 inches of additional snow to locations primarily north of Interstate 80. After these two events, snow depths ranged from

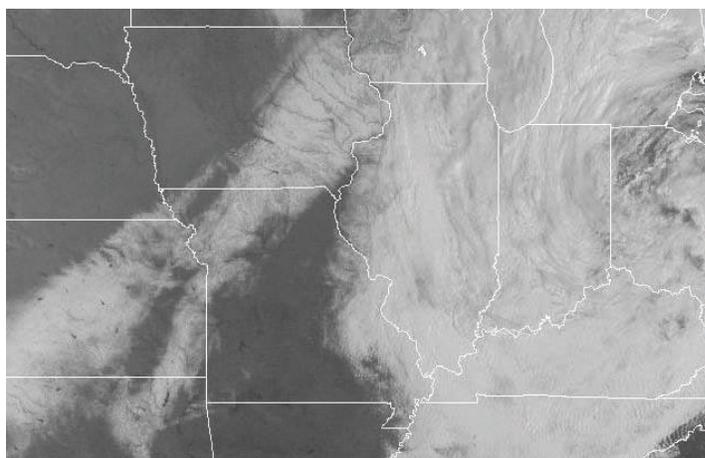
February

The only significant snowstorm in February occurred on the 20th and 21st, when 4 to 6 inches fell south of Highway 34 in Iowa, and west central Illinois. The snowfall was accompanied by wind gusts of 35 to 40 mph which caused considerable blowing and drifting.

(Continued on page 7)

...Near New Philadelphia, Illinois, a rare December tornado briefly touched down on the 27th...

On December 27th, an area of strong low pressure tracked from Oklahoma to northern Illinois. Unseasonably warm moist air flowing northward ahead of the low, combined with a strong cold front approaching from the west, triggered isolated severe thunderstorms in western Illinois. These storms formed during the morning hours while temperatures were in the lower 60s. Near Carthage Illinois, power poles were snapped and half of a barn roof was blown off. Near New Philadelphia Illinois, a rare December tornado briefly touched down. This EF0 tornado, with winds estimated at 80 mph, destroyed a garage with debris scattered about a third of a mile. Amazingly, the person



Satellite image taken 10:15 am on March 29, 2009 showing the extent of fresh snow cover from the early spring storm. Two main bands of snow can be seen extending from Kansas and Oklahoma northeast through northwest Missouri, eastern Iowa and northwest Illinois. The center of the departing storm can be seen as the swirling cloud mass over northeast Ohio. The back edge of the cloud field covers most of Illinois, obscuring the extent of the snow cover beneath.

The 2008-09 Winter in Review

(continued from page 6)

March

March not only came in like a lamb, but the weather that followed remained rather tame throughout much of the month. The most significant weather event wasn't even snow, but rather heavy rain. A strong storm system during the weekend of March 7-8 dumped widespread heavy rains of 2 to nearly 5 inches across much of the region and resulted in moderate to major flooding on many area rivers. Portions of eastern Iowa received 4 to 7 inches of snow on the 28th and 29th when low pressure tracked across the Midwest. The location that picked up the most snow

from this event was the Cedar Rapids area with a total accumulation of 7 inches. A satellite image showing the extent of the snow can be seen on page 6. Believe it or not, some storm spotters reported snowflakes the size of half dollars!

April

The final snow event of the winter season occurred on April 5-6 when 1 to 3 inches fell across portions of eastern Iowa and western Illinois.

...storm spotters reported snowflakes the size of half dollars...

TORNADO SAFETY

In Houses with basements: Seek shelter in the basement, under sturdy furniture if possible.

In Houses without basements: Take cover in the center part of the house, on the lowest floor, in a small room such as a closet or bathroom, or under sturdy furniture. Keep away from windows.

In Shopping Centers: go to a designated shelter area (not to your parked car!).

In Office Buildings: go to an interior hallway on the lowest floor, or to the designated shelter area.

In Schools: follow advance plans to a designated shelter area, usually an interior hallway on the lowest floor. If the building is not of reinforced construction, go to a nearby one that is, or take cover outside on low, protected ground. Stay out of auditoriums, gymnasiums, and other structures with wide, free-span roofs.

In Automobiles: leave your car and seek shelter in a substantial nearby building, or lie flat in a nearby ditch or ravine and cover your head.

In Open Country: lie flat in the nearest ditch or ravine.

In Mobile Homes: Mobile homes are particularly vulnerable and *should be evacuated*. Trailer parks should have a community storm shelter and a warden to monitor broadcasts throughout the severe storm emergency. If there is no shelter nearby, leave the trailer and take cover on low, protected ground and cover your head.

Tornado Quiz

1) What is the average number of tornadoes reported in the United States each year?

2) What percentage of tornadoes reach EF4 strength or higher?

3) On average, how many people are killed by tornadoes each year in the United States?

4) Based on statistics, at what time of day are tornadoes most likely in our service area covering eastern Iowa, western Illinois and extreme northeast Missouri?

5) Based on statistics, what month are tornadoes most likely in this same area.

Answers can be found on the bottom left margin on page 2.

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