

NWS Lincoln Severe Weather Operations Topics

Chris Miller

Warning Coordination Meteorologist

March 6, 2010

The background features a large, faded logo for the National Weather Service (NWS) Lincoln. The logo is circular with a red border containing the text "NATIONAL WEATHER SERVICE" and "LINCOLN". Inside the circle is a blue globe with a white lightning bolt striking it. Above the globe, the word "NWS" is visible in a blue circle. The entire background is a soft-focus image of a cloudy sky.

NWS LINCOLN WARNING OPERATIONS



Plan

Practice

Monitor

Act

Planning

- ILX Severe Weather Ops Plan

- **Outline of severe operations**

- Dissemination procedures for all severe wx products
 - Staffing guidelines
 - Communications
 - Policies
 - Damage surveys

WFO Central IL Severe Weather Operations Plan



Planning

- Staffing

- Normal Operations

- 2 – 3 Forecasters

- Severe Operations

- 2 – 3 Forecasters

- 6 – 8 Staff for
“Warning Teams”

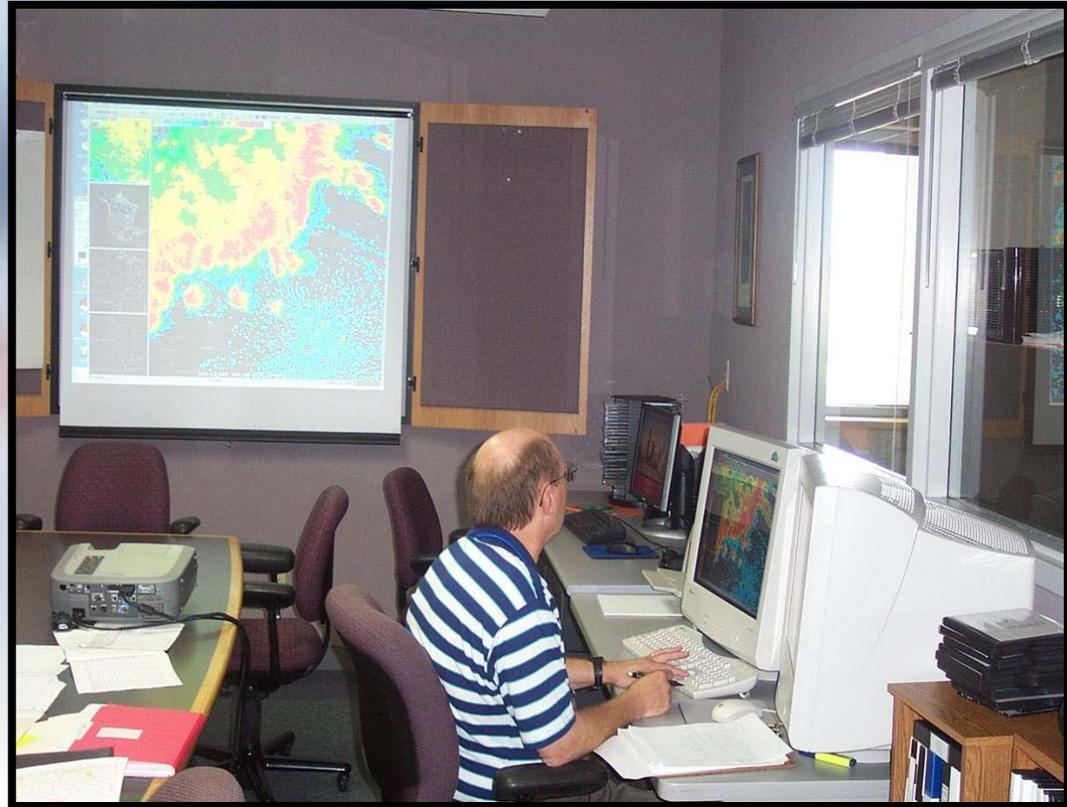
- 1 – 3 HAMs



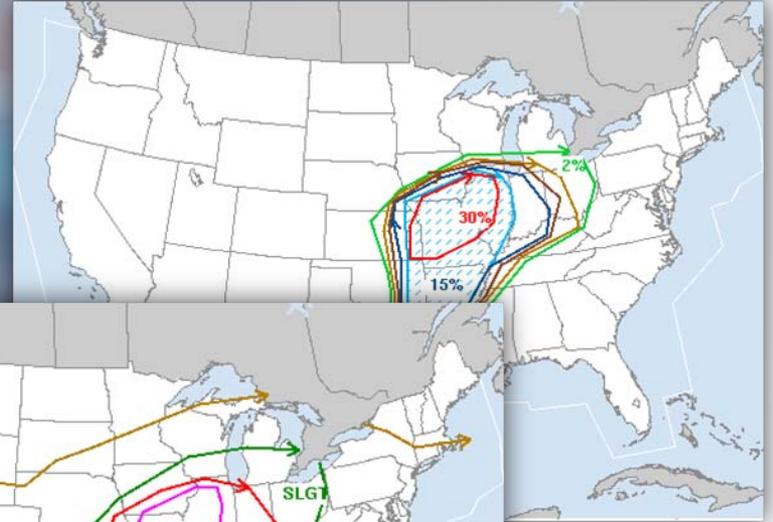
Practicing

- Staff Training

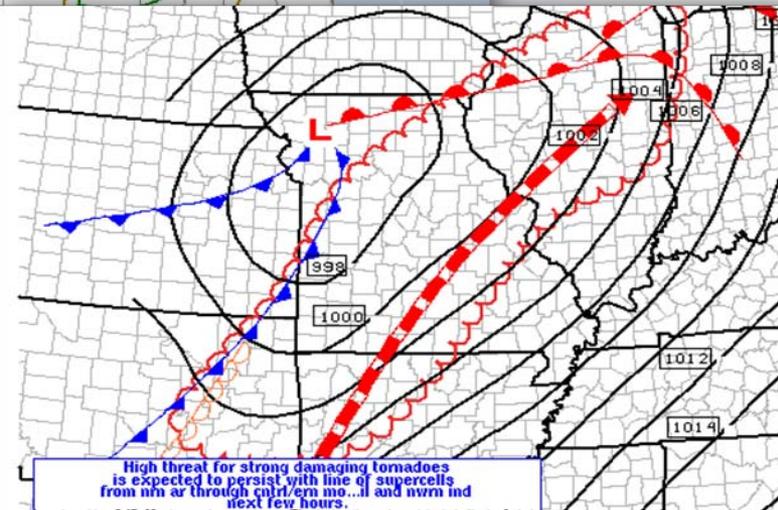
- Internal Workshops
- Case Study Reviews
- Drills
- Warning Team Scenarios
 - Weather Event Simulator (WES)



Monitoring

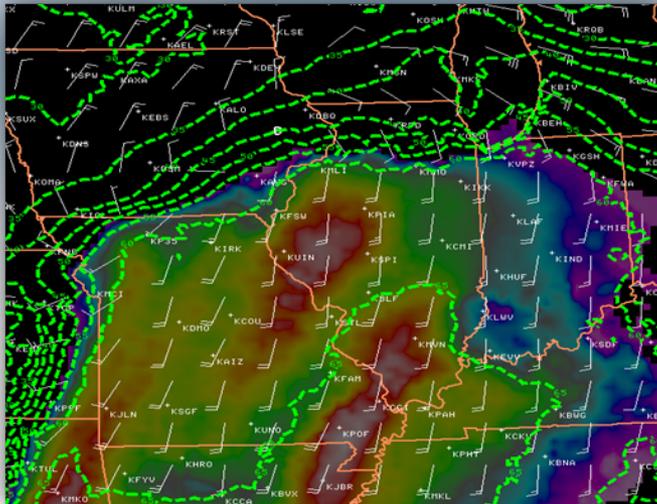


 SPC DAY1 CONV OUTLOOK
ISSUED: 1708Z
VALID: 12/1630Z-13/1200Z
FORECASTER: GOSS
National Weather Service
Storm Prediction Center Norman, Oklahoma



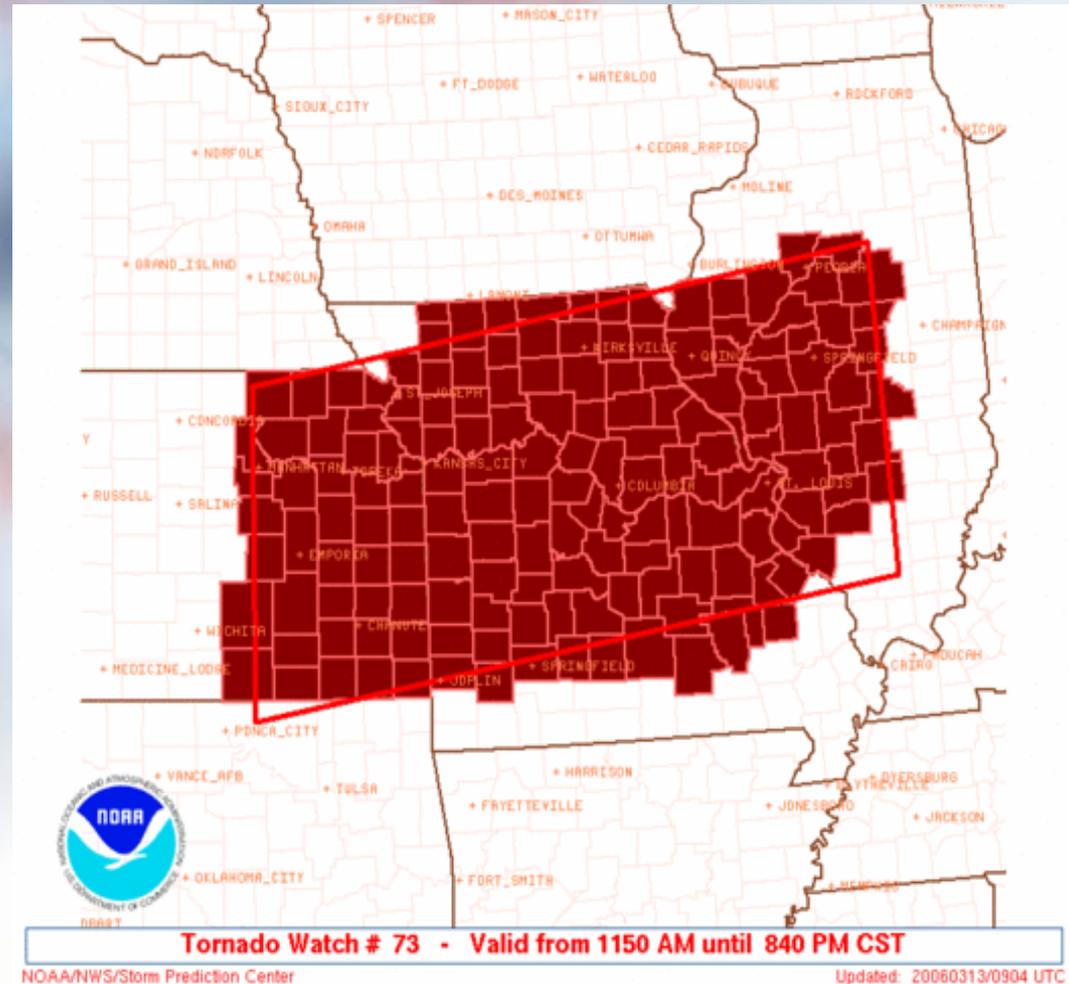
High threat for strong damaging tornadoes is expected to persist with line of supercells from nm ar through cntr/em mo...il and nwm ind next few hours.

SPC MCD #0273



Acting

- Collaboration with SPC
- Conference Calls with our partners
- Disseminating information to the customers



The background features a large, faded logo for the National Weather Service Lincoln office. The logo is circular with a red border containing the text "NATIONAL WEATHER SERVICE" and "LINCOLN" at the bottom. Inside the circle is a blue globe with a white lightning bolt striking it. Above the globe, the word "NWS" is visible in a blue circle.

NWS LINCOLN SEVERE WEATHER VERIFICATION

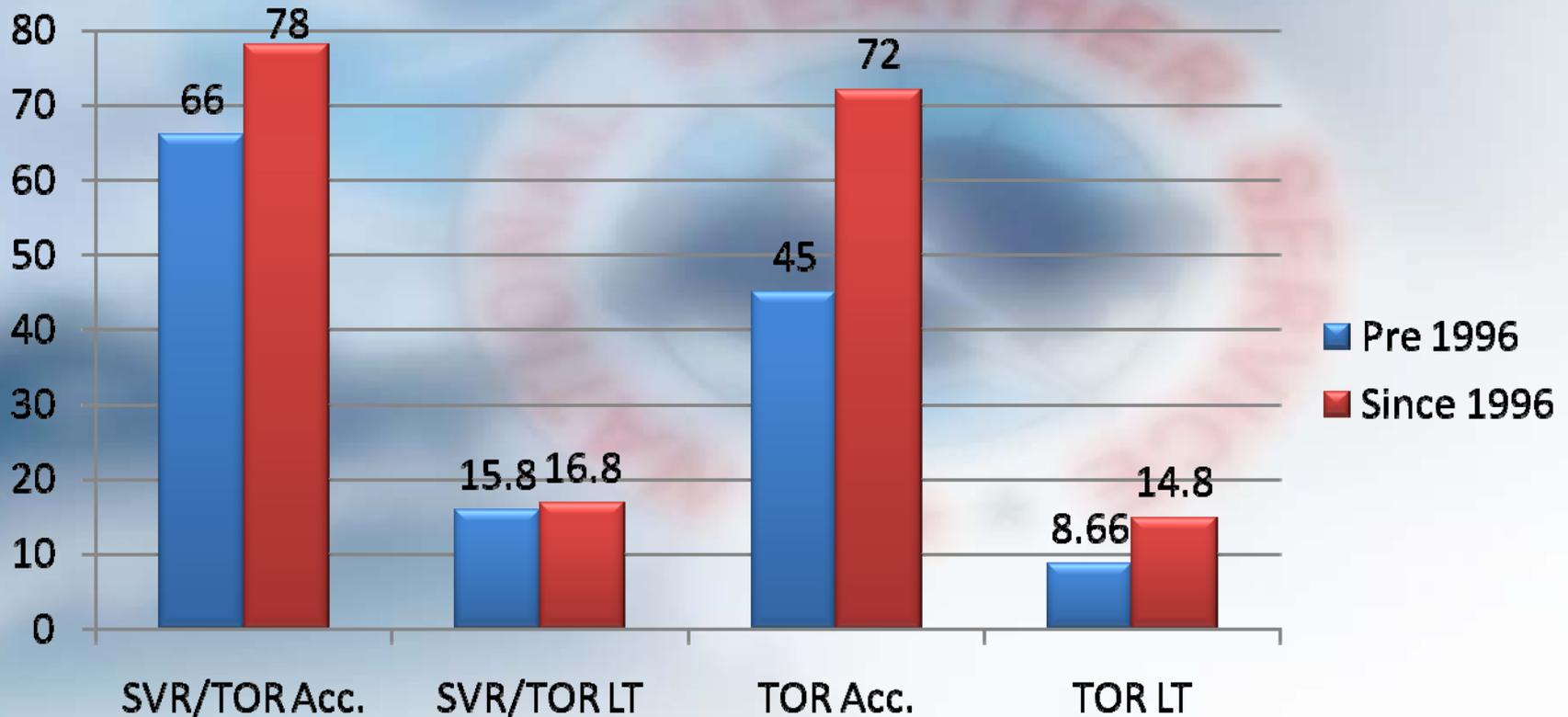
Severe Verification Stats – pre 1996

- **Severe T-storm & Tornado Warnings**
 - **Accuracy = 66%**
 - **Lead Time = 15.8 min.**
- **Tornado Warnings**
 - **Accuracy = 45%**
 - **Lead Time = 8.6 min.**

Severe Verification Stats – since 1996

- **Severe T-storm & Tornado Warnings**
 - **Accuracy = 78%**
 - **Lead Time = 16.8 min.**
- **Tornado Warnings**
 - **Accuracy = 72%**
 - **Lead Time = 14.8 min.**

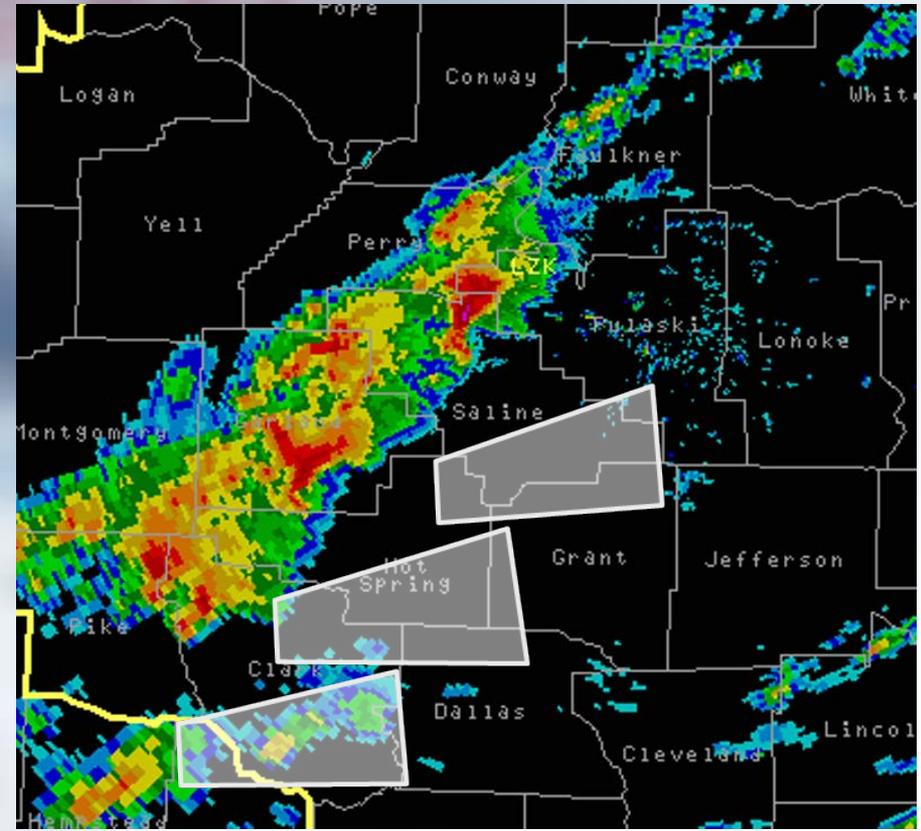
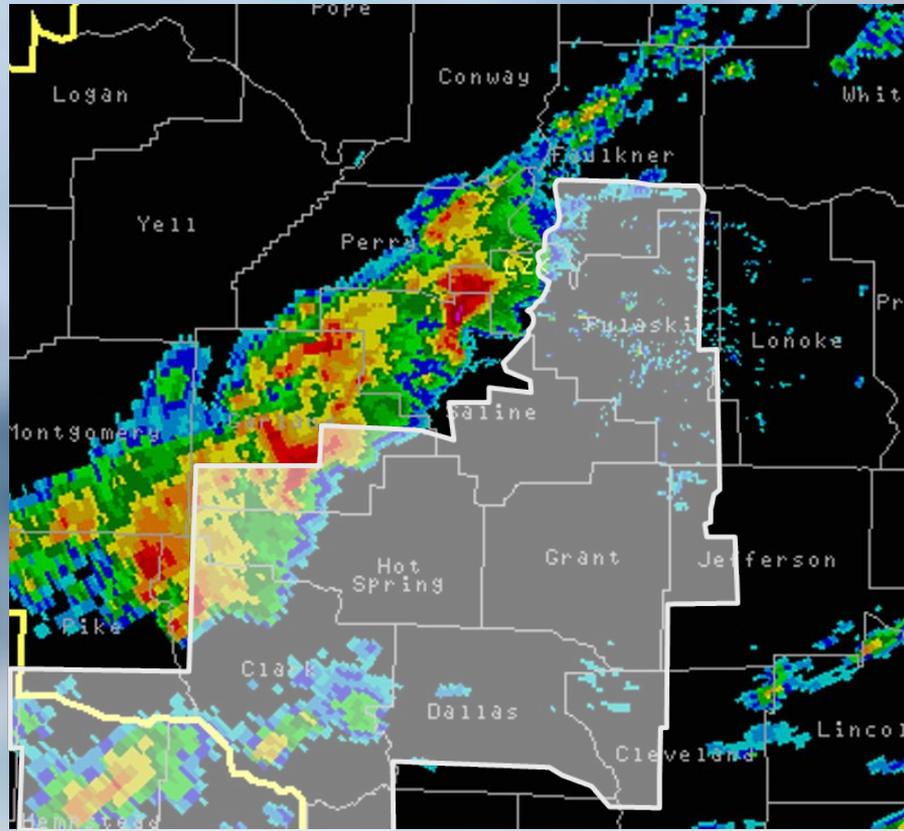
Comparison of Verification



What caused the change?

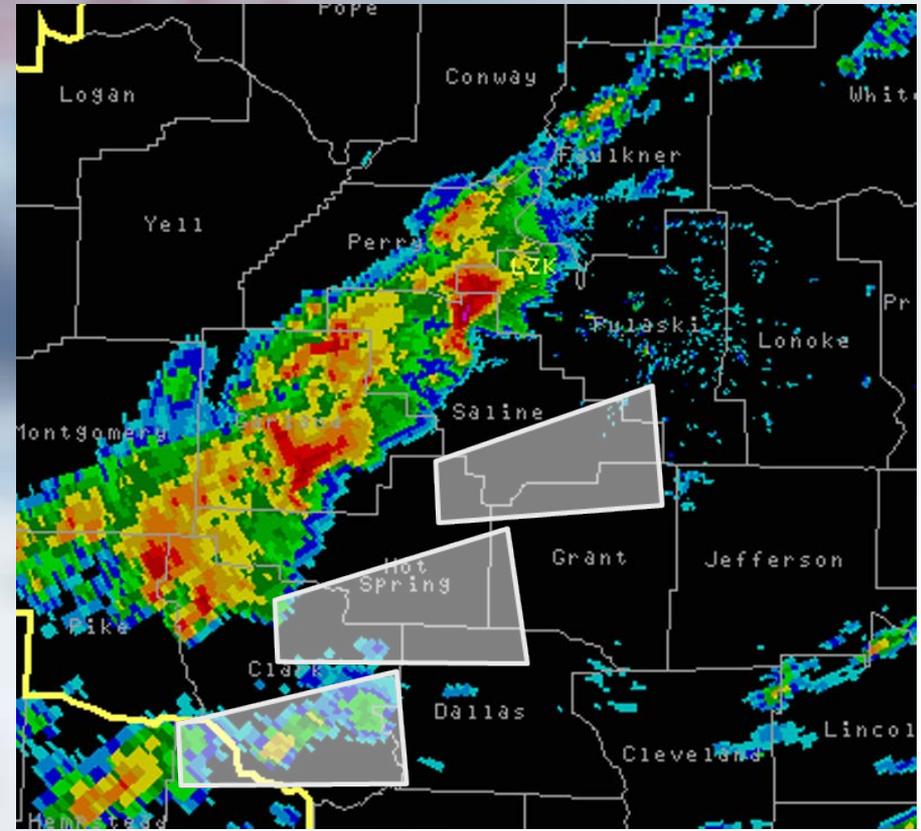
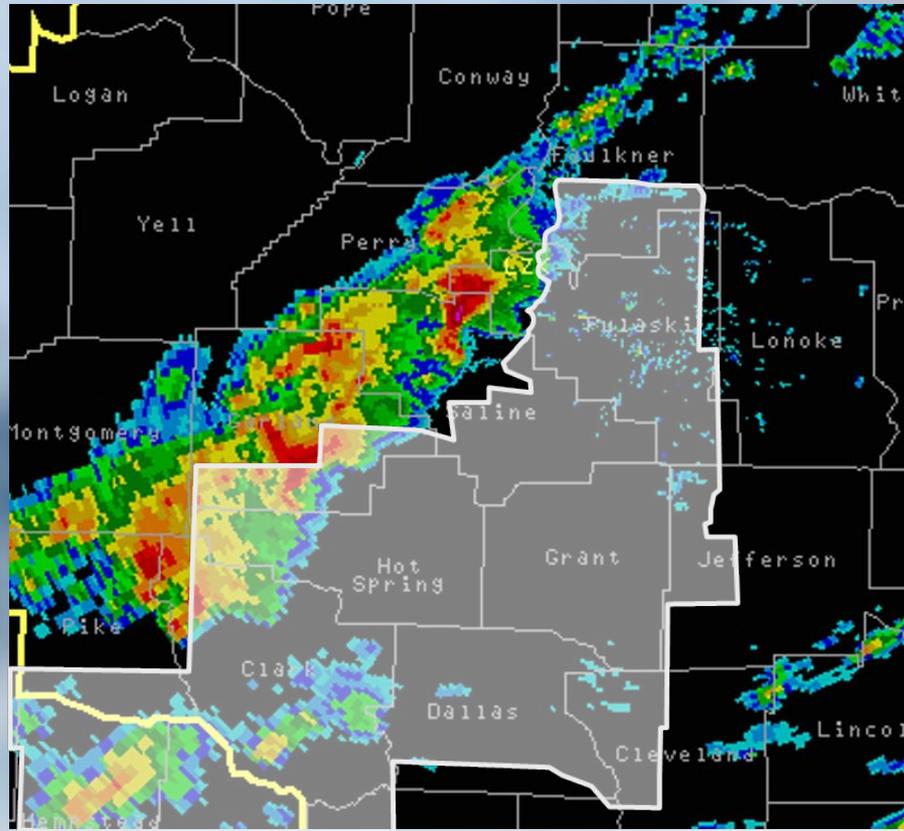
**Better training of spotters and NWS staff,
and the Doppler Radar**

Severe Verification – Polygon warnings



NWS Lincoln switched to Polygon warnings in 2008. Since then there has been a **78%** reduction in the warned area.

Severe Verification – Polygon warnings



The accuracy and lead time also increased:

Accuracy 78% to 83%

Lead Time 16.8 min to 19.2 min

The background features a blurred logo for the National Weather Service Lincoln office. The logo is circular with a red border containing the text "NATIONAL WEATHER SERVICE" and "LINCOLN". Inside the circle is a blue and white graphic of a lightning bolt striking a globe.

NWS LINCOLN SEVERE WEATHER POLICIES AND PROCEDURES

Hierarchy of “ideal” Severe Event

Outlooks



Watches



Warnings



Reporting



Hazardous Weather Outlook

Issued at
least 3 times
daily

Next 24 hours



Days 2 – 7



Spotter
Activation



ILZ043>046-052>057-061>063-066>068-071>073-191015-
CHAMPAIGN-CHRISTIAN-CLARK-CLAY-COLES-CRAWFORD-CUMBERLAND-DE WITT-
DOUGLAS-EDGAR-EFFINGHAM-JASPER-LAWRENCE-MACON-MOULTRIE-PIATT-
RICHLAND-SHELBY-VERMILION-
528 AM CDT THU OCT 18 2007

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF CENTRAL,
EAST CENTRAL, AND SOUTHEAST ILLINOIS.

.DAY ONE...TODAY AND TONIGHT

A POWERFUL STORM SYSTEM WILL TRACK FROM THE PLAINS INTO THE UPPER
MIDWEST TODAY, DRAGGING A COLD FRONT TOWARD CENTRAL ILLINOIS.
THUNDERSTORMS WILL DEVELOP AHEAD OF THE FRONT LATE THIS AFTERNOON
AND EVENING, WITH SOME OF THE STORMS LIKELY BECOMING SEVERE.

DAMAGING WINDS AND LARGE HAIL WILL BE THE PRIMARY THREAT FROM THE
STORMS...HOWEVER GIVEN THE AMOUNT OF WIND SHEAR IN THE
ENVIRONMENT...A FEW TORNADOES WILL ALSO BE POSSIBLE.

.DAYS TWO THROUGH SEVEN...FRIDAY THROUGH WEDNESDAY

NO HAZARDOUS WEATHER IS ANTICIPATED AT THIS TIME.

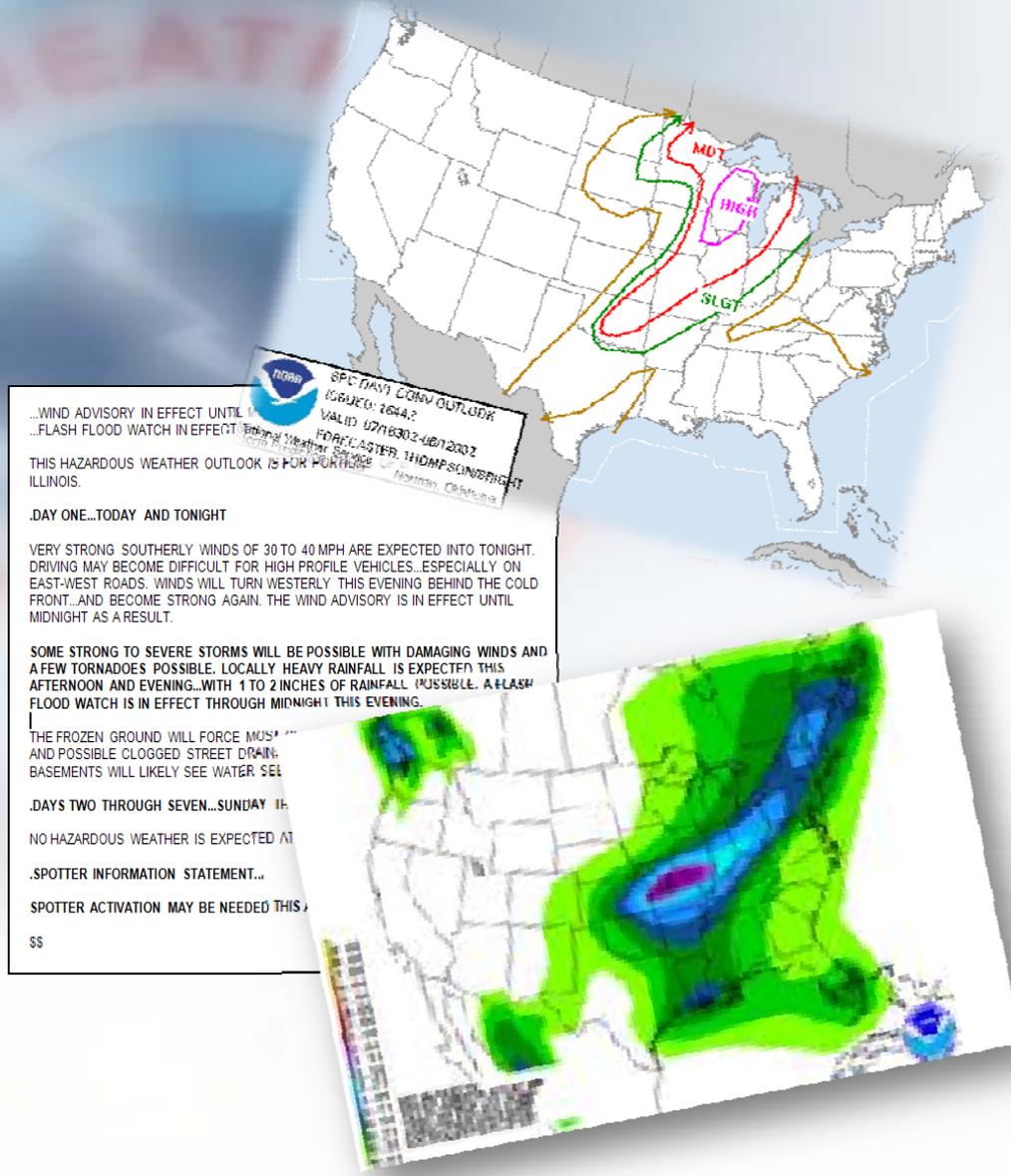
.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION WILL LIKELY BE NEEDED THIS AFTERNOON AND
EVENING...PARTICULARLY BETWEEN 3 PM AND 9 PM.

A CONFERENCE CALL WILL BE CONDUCTED FOR EMERGENCY MANAGERS AND THE
MEDIA AT 1030 AM.

What to do...Outlooks

- Complete preparedness
- Plan for the event
 - Notify spotters, first responders, & other officials
 - Be prepared to activate



Special Weather Statements

- Used to heighten awareness about weather hazards
 - Within 6 hours
 - Potential for a major weather event beyond 6 hours

ILZ042>057-061-201000-

LOGAN-DE WITT-PIATT-CHAMPAIGN-VERMILION-CASS-MENARD-SCOTT-MORGAN-SANGAMON-CHRISTIAN-MACON-MOULTRIE-DOUGLAS-COLES-EDGAR-SHELBY-INCLUDING THE CITIES OF...LINCOLN...CHAMPAIGN...URBANA...DANVILLE...JACKSONVILLE...SPRINGFIELD...TAYLORVILLE...DECATUR...CHARLESTON...MATTOON...SHELBYVILLE

339 PM CST FRI FEB 19 2010

SCATTERED LIGHT RAIN AND LIGHT SNOW SHOWERS WILL OCCUR TONIGHT... WITH LESS THAN 1 INCH OF SNOW POSSIBLE. A STRONGER STORM SYSTEM WILL LIKELY BRING 2 TO 4 INCHES OF SNOW FROM AFTER MIDNIGHT SATURDAY NIGHT THROUGH MONDAY MORNING. HEAVIER SNOWFALL AMOUNTS ARE POSSIBLE NORTH OF I-72 WITH LIGHTER AMOUNTS ALONG AND SOUTH OF A SHELBYVILLE TO CHARLESTON TO PARIS LINE. FREEZING RAIN AND SLEET COULD MIX IN WITH THE SNOW SATURDAY NIGHT INTO SUNDAY MORNING. MAINLY RAIN IS EXPECTED SUNDAY AFTERNOON THEN THE RAIN CHANGING BACK TO SNOW DURING SUNDAY EVENING. THE SNOW IS EXPECTED TO DIMINISH BY MONDAY AFTERNOON. THERE IS STILL SOME UNCERTAINTY REGARDING THE EVENTUAL TRACK OF THE STORM FOR LATER THIS WEEKEND...AND HOW FAR NORTH THE WARM AIR WILL SURGE AHEAD OF THE STORM. ANY SHIFT NORTH OR SOUTH OF THE CURRENT PROJECTED TRACK OF THE LOW...WILL ALSO BRING ABOUT A SHIFT IN THE HEAVY SNOW BAND...AND HOW FAR NORTH THE MIXED PRECIPITATION REACHES. STAY TUNED FOR LATER FORECASTS ON THIS WINTER WEATHER SITUATION.

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Special Weather Statements

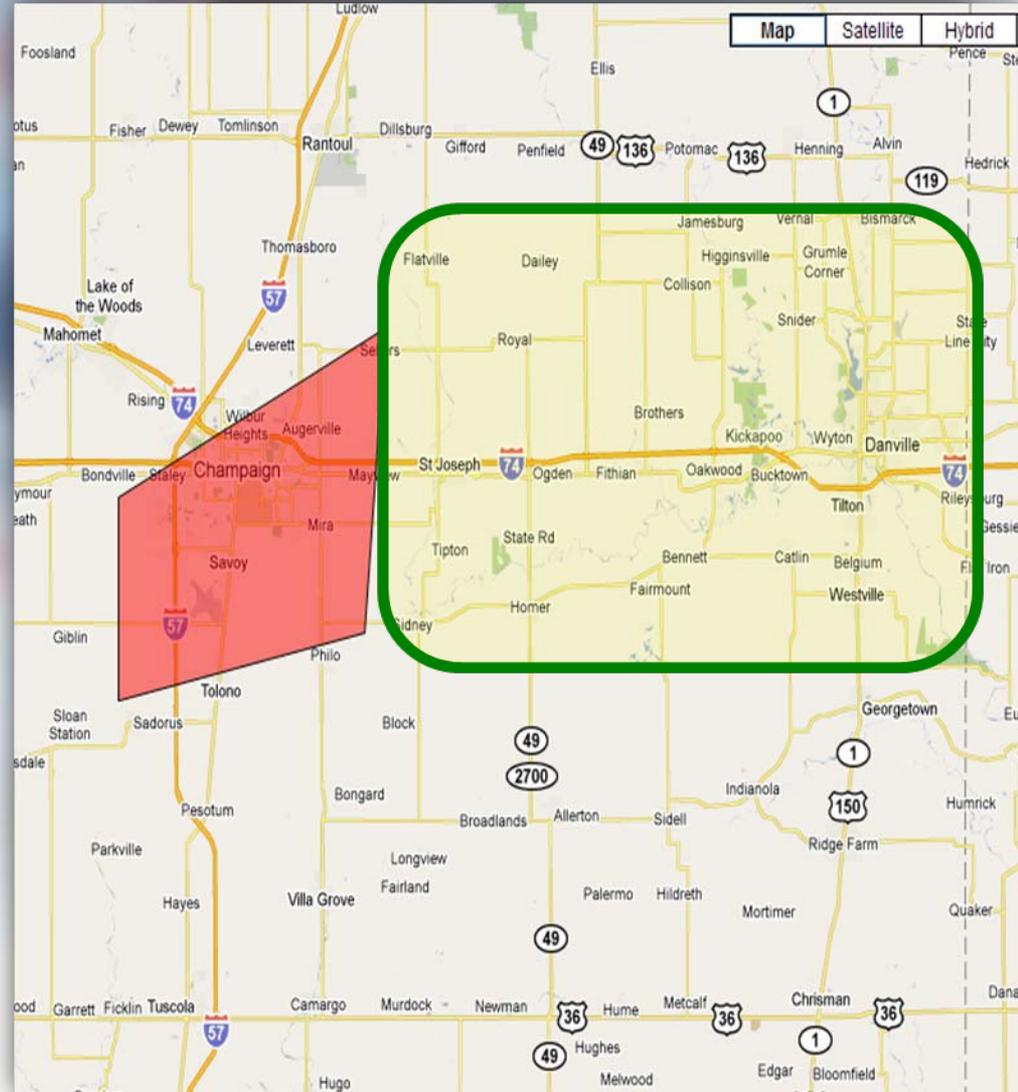
- Strong Storms
“Significant Weather Alert”

- 40 to 55 mph wind

- Hail < 1.00”

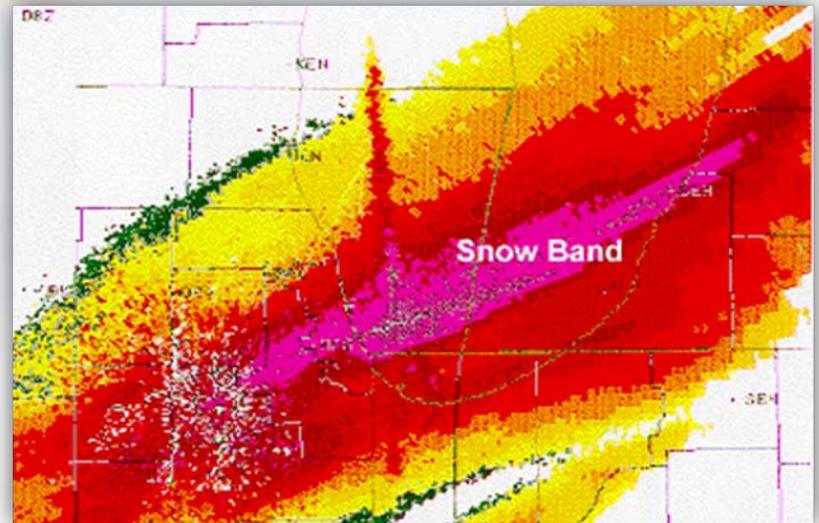
- Cold Air Funnel

- “Heads-up” info for areas downstream of severe storms



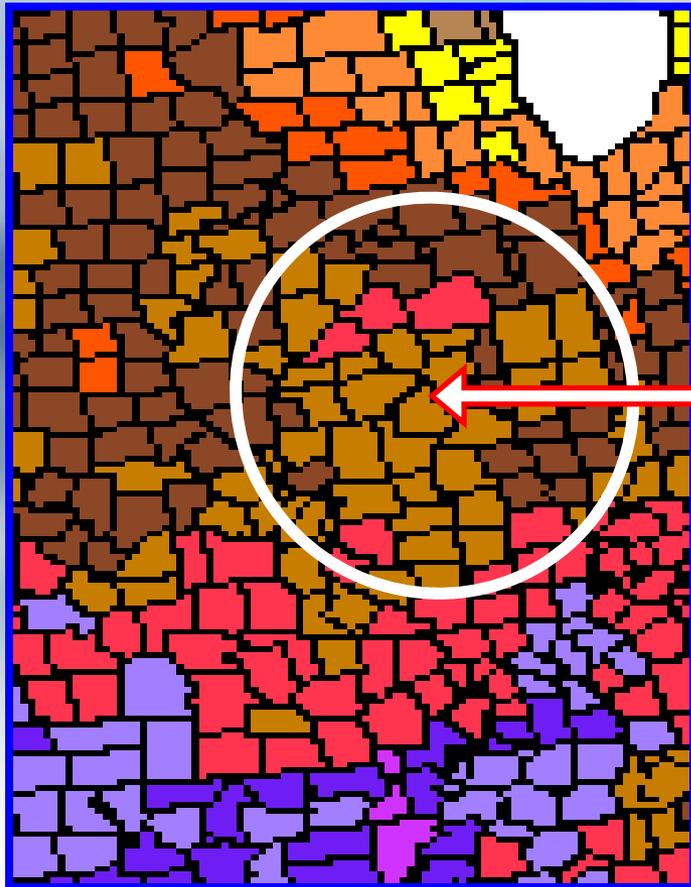
Special Weather Statements

- Other Short Term Hazards, such as:
 - **Black ice**
 - **Heat Index or Wind Chill at, or just below advisory levels**
 - **Heavier snow bands during a winter storm**
- Major events beyond 6 hours



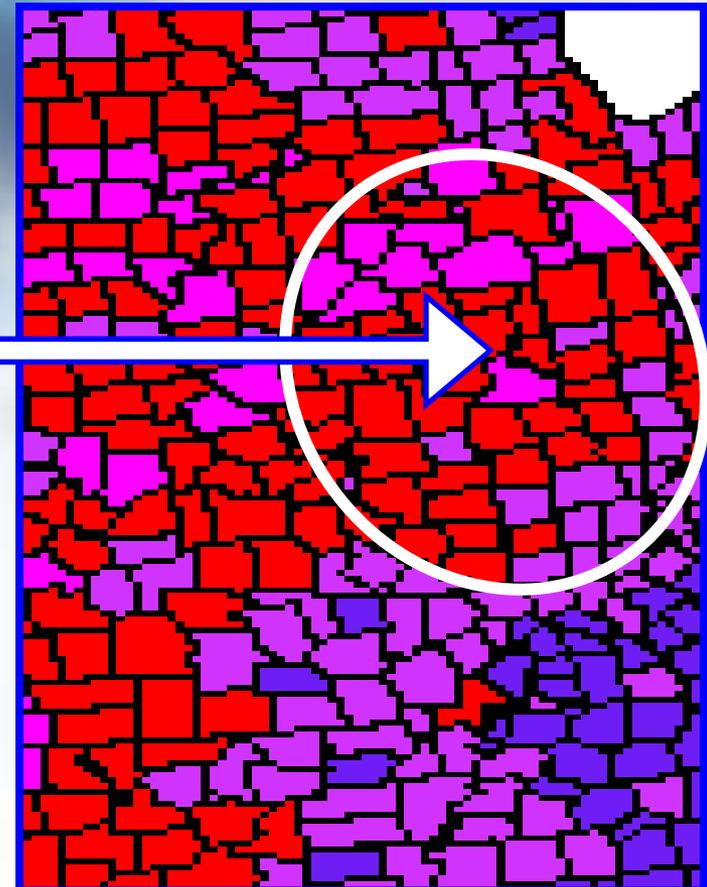
Watches – Annual Averages

Tornado Watches



6 – 8 Tor
Watches
Per year

Severe T-storm Watches



12-15 Svr
Watches
Per year

PDS Tornado Watches:

Particularly Dangerous Situation

- Potential is high for multiple **STRONG** or **VIOLENT** tornadoes
 - Fairly rare – only **7%** have been PDS
- 4 Times as likely to have at least 2 strong or violent tornadoes in a PDS Watch

Particularly Dangerous Situation (PDS) Tornado Watch 77

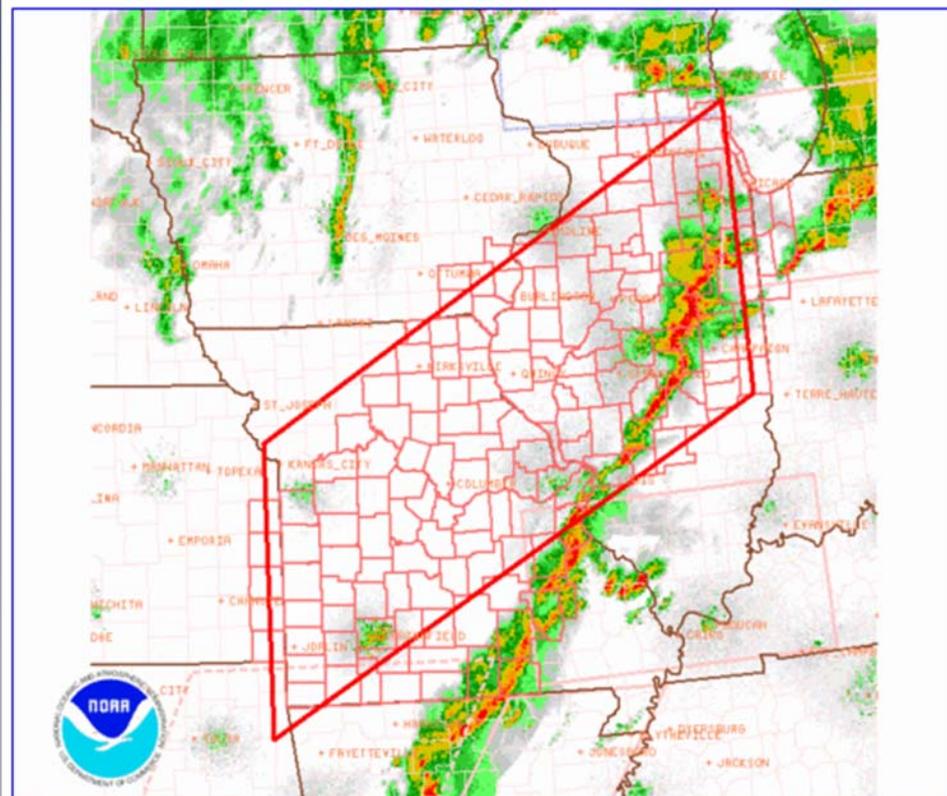
Initial RADAR image for Watch 77

Initial List of Counties in Watch 77 (WOU)

Note: The Watch Probability Tables are experimental.

< Previous WW

Next WW >



Tornado Watch # 77 • Valid from 840 PM until 400 AM CST

NOAA/NWS/Storm Prediction Center

Updated: 20060313/0944 UTC

What to do...Watches

- Activate as the storms approach
 - Use the 2 county rule:
When storms or warnings are two counties away – call out spotters
- Check our web page for the latest info



National Weather Service Weather Forecast Office
Central Illinois

Home Site Map News Organization

Local forecast by "City, St" or Zip Code
City, St

Current Hazards
Watches/Warnings
Outlooks
Submit Report

Current Conditions
Observations
Radar
Satellite
Observed Precip

Forecasts
Forecast Discussion
Local Area
Activity Planner
Aviation Weather
Fire Weather
Severe Weather
Hurricane Center

Hydrology
Rivers & Lakes

Climate
Local
National
Drought

Top News of the Day

- Hot and Humid Weather Expected This Weekend
- Major Severe Weather Front on August 4
- Summer Newsletter Now Available (PDF, 1.1 MB)

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Radar

Click on the map below for the best forecast.

Read watches, warnings & advisories

Flood Warning
Heat Advisory
Special Weather Statement
Hazardous Weather Outlook
Short Term Forecast

Last map update: Fri, Aug. 7, 2009 at 11:50:41 am CDT

Severe T-storm Warnings

- Wind damage or wind gusts \geq 58 mph
- Large hail \geq 1.00 inch
- Maximum wind & hail tag



For
2010



LAT...LON 3882 9418 3857 9414 3859 9458
TIME...MOT...LOC 1556Z 259 DEG 31KT
WIND...HAIL 70 MPH 1.75 IN

\$\$

(Bottom of the SVR and SVS)

Tornado Warnings

- Based on at least 2 of 3 items below:
 - Spotter Report
 - Radar Indication
 - Atmospheric support
- The past few years we have been issuing “polygon” warnings
 - Check graphic or see the “Locations Impacted” in text for towns in path of storm



Warning Polygons



Flash Flood Warnings

- Water flowing over roads 6" deep or more
- Water flowing over a bridge
- Ponding 1' or deeper
- Rapid rises in creeks or streams



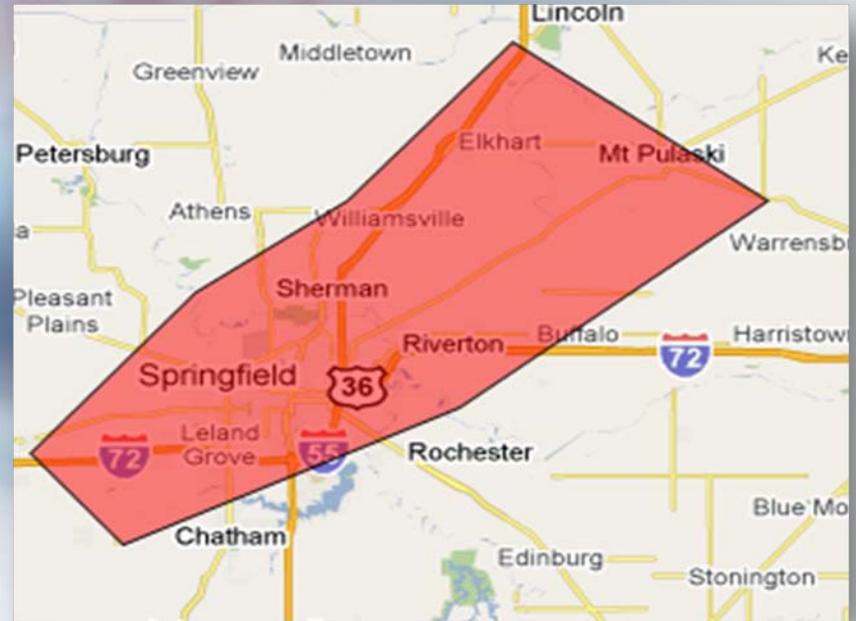
Other Flood Warnings

- **Areal Flood Warning**
 - **Widespread flooding more than 6 hours after the heavy rain event**
- **Flood Warning**
 - **Issued for long term flooding at river forecast points**



What to do...Warnings

- Be alert and notify the spotters / public
- Seek reports and relay them as quickly as possible !



THE NATIONAL WEATHER SERVICE IN LINCOLN HAS ISSUED A TORNADO WARNING FOR...

NORTHERN SANGAMON COUNTY...
SOUTHERN LOGAN COUNTY...

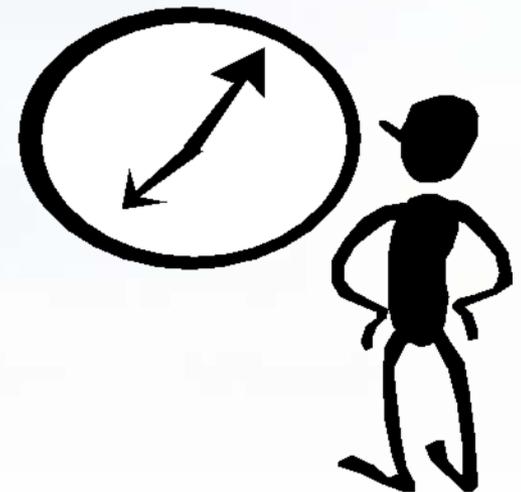
UNTIL 1215 PM CDT.

AT 1140 AM CDT...NATIONAL WEATHER SERVICE METEOROLOGISTS DETECTED A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A TORNADO 11 MILES SOUTHWEST OF SPRINGFIELD...MOVING NORTHEAST AT 60 MPH.

LOCATIONS IMPACTED INCLUDE...SPRINGFIELD...SHERMAN...
RIVERTON...WILLIAMSVILLE... CORNLAND... ELKHART... MOUNT PULASKI...

Reporting

- Real-time reports:
 - Help with NWS warning decisions
 - Warning response better with reports
- Please don't filter reports!
- Delayed reports are also **IMPORTANT**, even several days AFTER the event





TOOLS FOR EMERGENCY MANAGERS & MEDIA

Conference Calls

- Done for all MDT risk & HIGH risk outlooks

- Includes:

- Emergency Managers
- IEMA / FEMA
- Local TV Weather Depts.

- Also done for flooding and winter storms

- Notification through HWO & e-mail



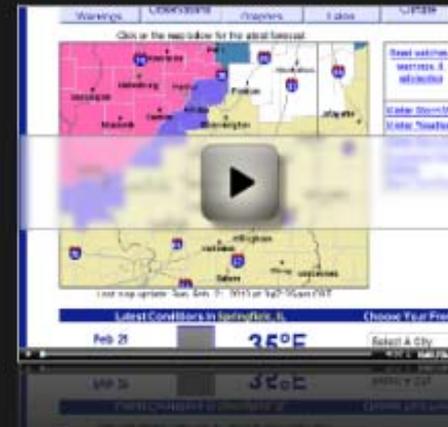
Multimedia Web Briefings

- Done for “High Impact” events
- Similar criteria as Conference Calls
- Short (2-3 min.) briefing of expected conditions
 - Graphics & narration
 - Can download as MP3



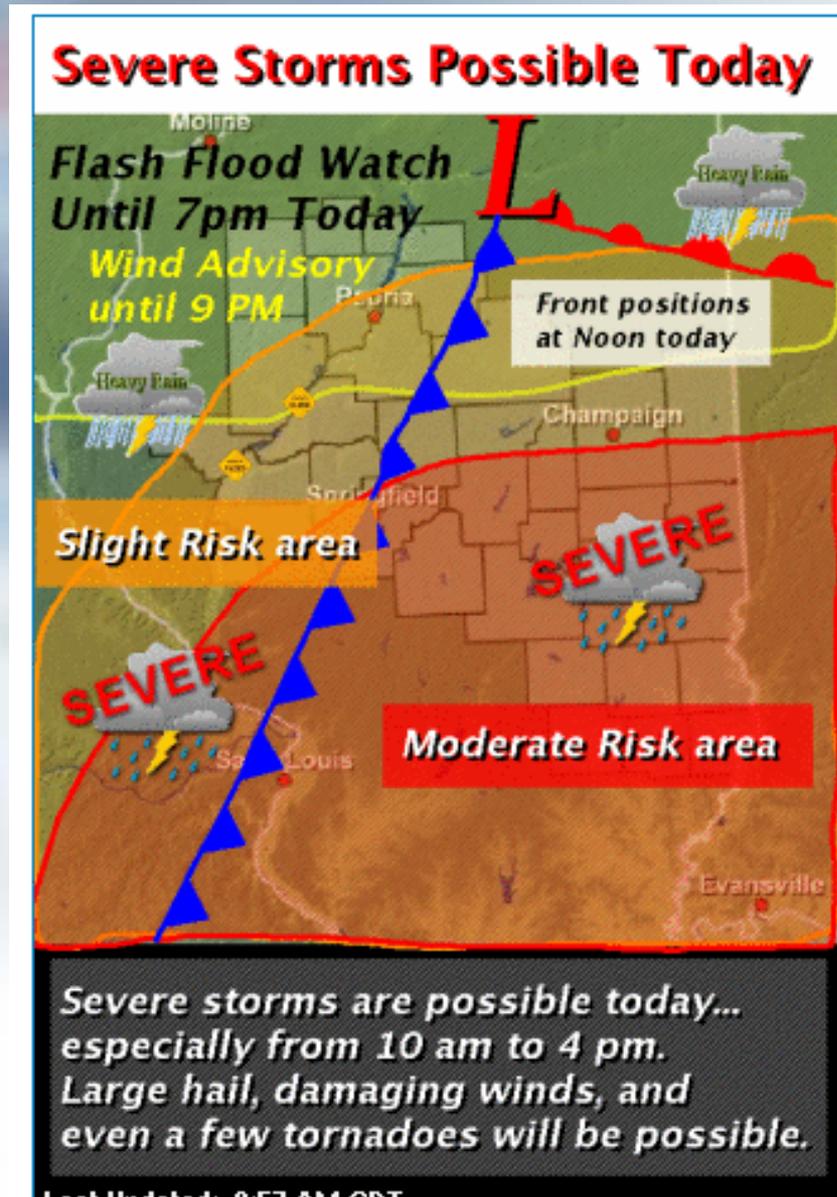
National Weather Service - Central Illinois Multimedia Briefing

The Multimedia Briefing is a product that is primarily designed to keep you informed of upcoming hazardous weather events over the next several days. The briefing will be updated as needed. However, it will be suspended during times of severe, convective weather. During those times, you are urged to consult our [severe weather summary page](#) for the most timely information.



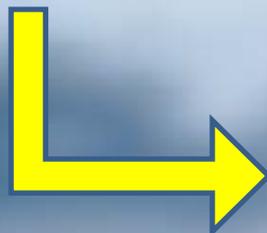
Daily Weather Story

- A graphical representation of the main weather features for the next several days
 - **Similar to a graphical Hazardous Weather Outlook**



NWS "Outlooks" web page

Outlook
page



 National Weather Service Weather Forecast Office
Central Illinois

Home Site Map News Organization

Local forecast by "City, St" or Zip Code
City, St Go

Current Hazards
Watches/Warnings
Outlooks
Submit Report

Current Conditions
Observations
Radar
Satellite
Observed Precip

Forecasts
Forecast Discussion
Local Area
Activity Planner
Aviation Weather
Fire Weather
Severe Weather
Hurricane Center

Hydrology
Rivers & Lakes

Climate
Local
National
Drought

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-  Major Severe Weather Event on August 4
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Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate Radar

Click on the map below for the latest forecast.



Last map update: Fri, Aug. 7, 2009 at 11:50:41 am CDT

Read watches, warnings & advisories 

- [Flood Warning](#) 
- [Heat Advisory](#) 
- [Special Weather Statement](#) 
- [Hazardous Weather Outlook](#) 
- [Short Term Forecast](#) 

NWS “Outlooks” web page



National Weather Service Weather Forecast Office

Central Illinois

Severe Weather

- Latest Local Hazardous Weather Outlook

Day 1



Day 2



Day 3



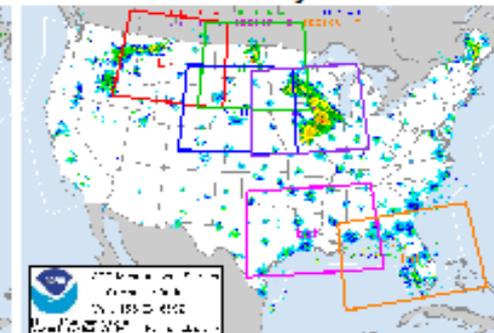
Mesoscale Discussion



SPC Activity Chart



SPC Mesoanalysis Chart



Showing a 1 hour radar loop, the current Day 1 convective outlook, and all active watches.

Click on the image for a detailed look at severe weather parameters for various sectors across the county.

NWS “Outlooks” web page



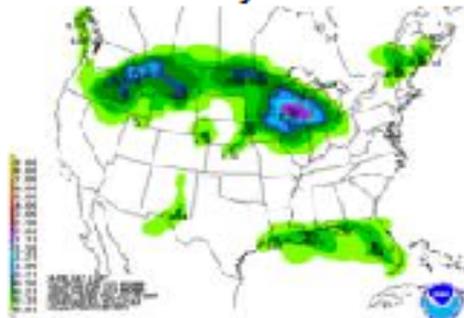
National Weather Service Weather Forecast Office

Central Illinois

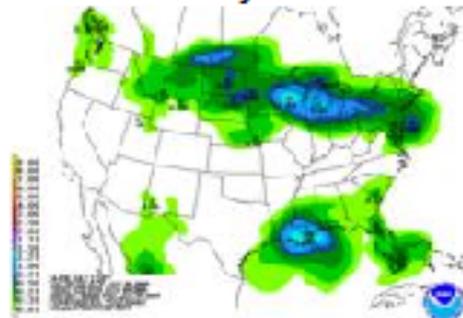
Rainfall

- Latest Local Hydrologic Outlook
- Days 1-3
- Excessive rainfall

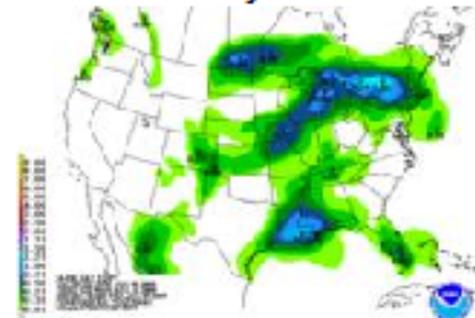
Day 1



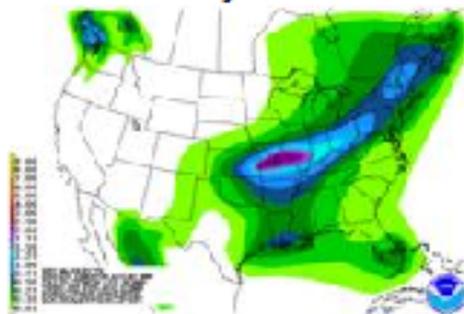
Day 2



Day 3



Day 4-5



Excessive Rainfall



NWS “Outlooks” web page



National Weather Service Weather Forecast Office

Central Illinois

Winter

- [Heavy snow discussion](#)

Snow Probability (4 inches or more)

Day 1



Day 2



Day 3



Freezing Rain Probability (1/4 inch or more)

Day 1



Day 2



Day 3



NWS "Outlooks" web page



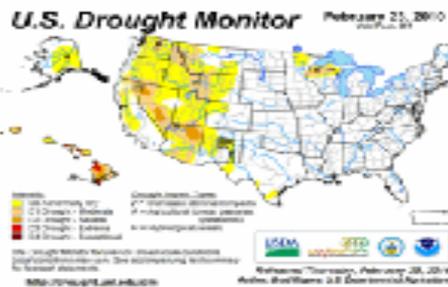
National Weather Service Weather Forecast Office

Central Illinois

Drought

- [Local Drought Discussion](#)
- [Weekly Assessment Discussion](#)
- [Seasonal Drought Outlook Discussion](#)

Weekly Assessment



Seasonal Outlook



Fire Weather

Day 1



Day 2



NWS Chat

- **Allows EMs or the media to chat directly with the NWS**
 - **Monitored 24x7 at the NWS Lincoln**
 - **Very useful for severe weather or winter storm operations**
 - **Easy to use and free!**

NWS Chat

ilxchat@conference.nwschat.weather.gov

Conversation Options Send To

ilxchat@conference.nwschat.weather.gov

(2/23/2010 8:02:42 AM) nwsbot: ILX issues [Public Information Statement \(PNS\)](#) ... PEORIA ILLINOIS 8TH SNOWIEST WINTER ON RECORD SO FAR ...
(2/23/2010 8:53:27 AM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 12:00 PM CST
(2/23/2010 6:00:00 PM) nwsbot: ----- Feb 24, 2010 [GMT] -----
(2/23/2010 7:38:11 PM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 3:00 AM CST
(2/24/2010 8:34:02 AM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 4:00 AM CST
(2/24/2010 6:00:00 PM) nwsbot: ----- Feb 25, 2010 [GMT] -----
(2/24/2010 8:25:27 PM) nwsbot: ILX [continues Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 4:00 AM CST
(2/25/2010 8:41:26 AM) nwsind-wcm: sunshine has returned to Indy but more lake clouds and flurries likely to return by noon.
(2/25/2010 8:44:16 AM) **ILX_5**: Sorry the sunshine is brief, IND.... I'm ready for spring, personally!
(2/25/2010 8:56:51 AM) nwsbot: ILX issues [Free Text Message \(FTM\)](#)
(2/25/2010 8:58:22 AM) nwsind-wcm: ILX...I am too!! But you now Grt Lks region winter doldrums, and you guys are usually just a tad cloudier for longer.
(2/25/2010 9:05:25 AM) nwsbot: ILX issues [Free Text Message \(FTM\)](#)
(2/25/2010 10:00:45 AM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 4:00 PM CST
(2/25/2010 11:09:54 AM) nwsbot: ILX issues [Free Text Message \(FTM\)](#)
(2/25/2010 6:00:00 PM) nwsbot: ----- Feb 26, 2010 [GMT] -----
(2/25/2010 8:06:40 PM) nwsbot: ILX [continues Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 26, 4:00 PM CST
(2/25/2010 8:10:03 PM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till Feb 27, 10:00 AM CST
(2/26/2010 8:38:28 AM) nwsbot: ILX [extends time of Flood Warning](#) for the Little Wabash River near Clay City [IL] till 10:00 PM CST
(2/26/2010 1:43:36 PM) nwsbot: ILX [cancels Flood Warning](#) for the Little Wabash River near Clay City [IL]
(2/26/2010 6:00:00 PM) nwsbot: ----- Feb 27, 2010 [GMT] -----
(2/27/2010 6:00:00 PM) nwsbot: ----- Feb 28, 2010 [GMT] -----
(2/28/2010 10:18:21 AM) nwsbot: ILX issues [Public Information Statement \(PNS\)](#) ... A LOOK AHEAD AT MARCH CLIMATOLOGICAL DATA ...
(2/28/2010 11:05:22 AM) nwsbot: ILX issues [Child Abduction Emergency \(CAE\)](#)
(2/28/2010 11:08:11 AM) nwsbot: ILX issues [Child Abduction Emergency \(CAE\)](#)
(2/28/2010 12:16:26 PM) nwsbot: ILX issues [Administrative Message \(ADR\)](#) for Adams, Alexander, Bond, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Champaign, Christian, Clark, Clay, Clinton, Coles, Cook, Crawford, Cumberland, De Kalb, De Witt, Douglas, DuPage, Edgar, Edwards, Effingham, Fayette, Ford, Franklin, Fulton, Gallatin, Greene, Grundy, Hamilton, Hancock, Hardin, Henderson, Henry, Iroquois, Jackson, Jasper, Jefferson, Jersey, Jo Daviess, Johnson, Kane, Kankakee, Kendall, Knox, La Salle, Lake, Lawrence, Lee, Livingston, Logan, Macon, Macoupin, Madison, Marion, Marshall, Mason, Massac, McDonough, McHenry, McLean, Menard, Mercer, Monroe, Montgomery, Morgan, Moultrie, Ogle, Peoria, Perry, Piatt, Pike, Pope, Pulaski, Putnam, Randolph, Richland, Rock Island, Saline, Sangamon, Schuyler, Scott, Shelby, St. Clair, Stark, Stephenson, Tazewell, Union, Vermilion, Wabash, Warren, Washington, Wayne, White, Whiteside, Will, Williamson, Winnebago, Woodford [IL] till 1:15 PM CST
(2/28/2010 6:00:00 PM) nwsbot: ----- Mar 01, 2010 [GMT] -----
(3/1/2010 6:00:00 PM) nwsbot: ----- Mar 02, 2010 [GMT] -----

5 people in room

nwsbot
ILX_5
nwsILX-edward.shimon
NWS St. Louis Long Ter...
wehtwx1

Font Insert Smile

iNWS (interactive NWS)

- Quick way to get NWS Warnings & Products
 - **iNWS Alerts:** e-mail alerts sent to your phone or computer
 - You customize what products you want and for the areas you want
 - **iNWS Mobile:** an app that will run on Java enabled mobile devices. Browse warnings, radar and forecasts from a map interface
 - **EXPERIMENTAL VERSION**

iNWS (interactive NWS)

- **AHPS Mobile:** Accesses current and forecast river stages and river impacts from a web enabled mobile device
- **iNWS Mobile Web:** Search for weather information by zip code or city.
 - COMING SOON...
 - Watches, Warnings, Advisories
 - Current weather, radar, satellite imagery
- **iCWSU:** Aviation information for pilots

iNWS (interactive NWS)

iNWS

Interactive National Weather Service

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Experimental Beta



iNWS is the home of new mobile and desktop innovations of the National Weather Service. iNWS strives to fulfill our mission of protecting life and property by using new technology to reach out to our customers.

iNWS Services

- A** **iNWS Alerts** *user customizable sms and e-mail alerts*
- H** **AHPS Mobile** *mobile hydrograph and alerting system*
- M** **iNWS Mobile** *nws blackberry/java cell phone application*
- C** **iCWSU** *aviation weather mobile web page*
- W** **iNWS Mobile Web** *nws mobile weather website*

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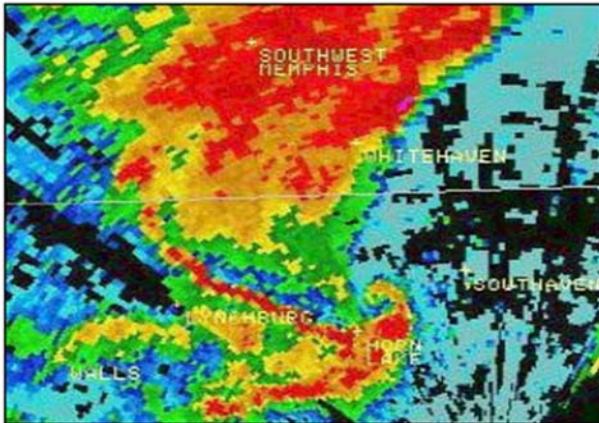
SEVERE WEATHER OPERATIONS: NWS RECOMMENDATIONS & BEST PRACTICES

Learning from recent events...



Service Assessment

Super Tuesday Tornado Outbreak of February 5-6, 2008



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service
Silver Spring, Maryland



Service Assessment

Mother's Day Weekend Tornado in Oklahoma and Missouri, May 10, 2008



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service
Silver Spring, Maryland

Recommendations...

- To improve public response, consider the use of wording such as **“...a tornado has been confirmed by spotters...”**

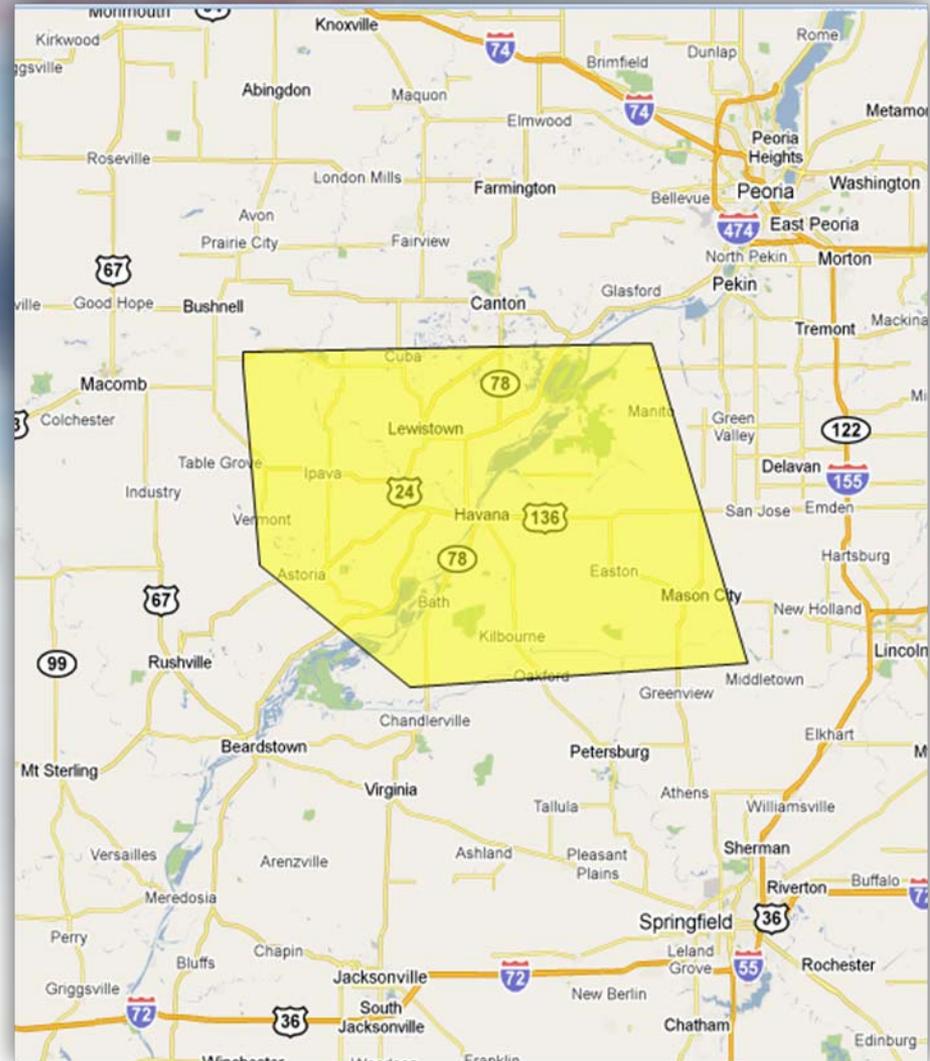
OR

“...a tornado is on the ground at... and is moving...”



Recommendations...

- Encourage TV stations & their vendors to display polygon warnings
- **Key point:** An entire area in or near a polygon is under the risk of the warned feature



Recommendations...

- The roles of the EMA/ESDA and the spotters are an **IMPORTANT** part of the **TOTAL WARNING** process
- There are benefits **AND** limitations in the use of sirens



Detect – Warn - Respond



Recommendations...

- NWS Chat was a beneficial tool for the NWS, EMs and the Media
- It is important for the NWS and EMs to communicate effectively during unusual, or fast changing situations in extreme weather events



Recommendations...

- Partner with local media outlets and emergency managers to take advantage of the “*post-event window of opportunity*” to raise awareness about NOAA Weather Radio



Recommendations...

- NWS should consider adding a societal impacts program
- Expand partnerships with academic institutions to study the warning process from issuance to response – **AND** incorporate the findings into NWS products



QUESTIONS ???

