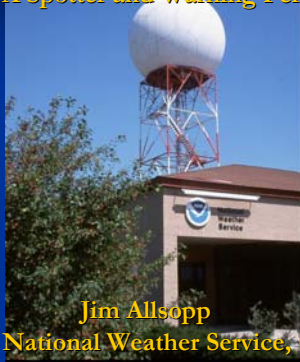


Behind the Scenes at WFO LOT

June 7 – A Spotter and Warning Perspective



Jim Allsopp
NOAA's National Weather Service, Chicago



Who Are We?

- U.S. Department of Commerce
 - National Oceanic and Atmospheric Administration (NOAA)
 - National Weather Service (NWS)
 - 122 Weather Forecast Offices in US, Guam and Puerto Rico
 - 13 River Forecast Centers
 - 13 National Centers
 - 22 Center Weather Service Units



WFO Chicago Area of Responsibility

NWS Chicago Serves...

- 10 million people in a 23 county area
- World's busiest airspace with 1.3 million flights and 95 million passengers passing through O'Hare and Midway combined
- Mariners on Lake Michigan – the 5th largest lake in the world
- 8 Interstate highway systems



Office Operations

- **Public Program**
 - Maintain/update gridded database
 - Zone (county) forecasts - 400 AM and 330 PM
 - Hazardous Weather Outlook - 430 AM & PM, 1100 AM
 - Short Term Forecasts - As needed
 - Hazardous weather watches, warnings, advisories
 - Winter
 - Non-Precipitation
 - Severe Storms
 - Flood

Office Operations

- **Aviation Program**
- **Marine Program**
- **Hydrologic Program**
- **Fire Weather**
- **Climate Services**



NWS Chicago Staff Total staff 23

- MIC (Meteorologist in Charge)
 - Administrative Assistant
- SOO (Science Operations Officer)
- WCM (Warning Coordination Meteorologist)
- 11 Forecasters
 - 5 Lead Forecasters
 - 5 Journeyman Forecasters
 - 1 Meteorologist Intern
- 3 Hydro-met Technicians (including OPL)
- 1 Service Hydrologist
- 1 ITO
- 1 Electronics Systems Analyst and 2 Electronic Technicians

Normal Operations Staffing 24/7/365

- Public forecaster
- Aviation/Marine forecaster
- Technician/data desk

Severe Weather Operations Staffing

- Event Coordinator
- Warning Decision Meteorologist and Warning Applications Meteorologist (1 or 2 teams)
- NWR Monitor
- Ground Truth
- Flash Flood Monitor
- Mesoanalyst – Environmental Monitor

When To Warn?

Rule of Three – Warn when

- Synoptic and meso scale environment conducive to tornado development
- Doppler radar indication of mesocyclone
- Trained spotter report

June 7 Tornado Outbreak

1 to 2 days before event

- Review staffing availability
- Issue HWO
- Conference call with County EM's, TV mets?
- Headline web page?
- Beef up wording in forecasts?



June 7 Tornado Outbreak

Morning of event

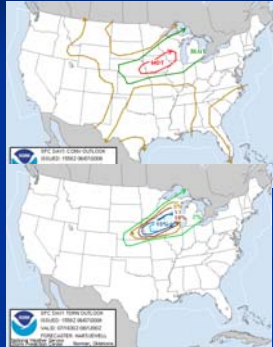
- Conference call with County EM's, TV mets?
- Reboot workstations, CRS, check supply of forms
- Meso-analysis, severe checklist, redistribute duties if needed



June 7 Tornado Outbreak

Noon - day of event

- Begin staffing up – evening shift in early?
- Update HWO
- Watch radar
- Begin NOWcasting



June 7 Tornado Outbreak

200 PM watch issuance – Go Time!

- Coordinate with SPC, surrounding offices and issue watch
- Call in additional staff
- Call in amateur radio team, make sure DuPage staffed up, state police notified
- Event Coordinator assigns duties



June 7 Tornado Outbreak

event timeline

- 1538: TOR issued S LaSalle/NW Livingston
- 1548: TOR issued N Livingston
- 1605: Spotter – wall and funnels near Lostat

June 7 Tornado Outbreak

event timeline

- 1623-1626: Spotters (4 reports from Fire, Police, spotters) first tornado reports west of Odell



June 7 Tornado Outbreak

event timeline

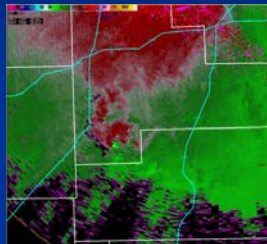
- 1628: TOR issued NE Livingston/SE Grundy
- 1635-1650: Spotter – multiple reports of second tornado west of Dwight
- 1700: Radar circulation fading at Livingston/Grundy line



June 7 Tornado Outbreak

event timeline

- 1721: TOR issued Will/S Cook as circulation reforms in NW Kankakee
- 1723: Spotter – Law enforcement/EM and spotters report tornado W of Essex

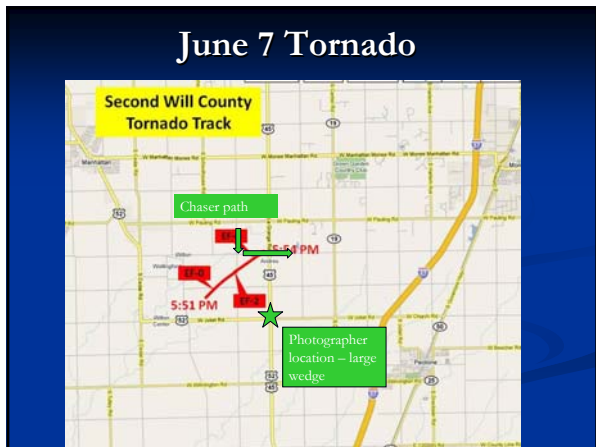




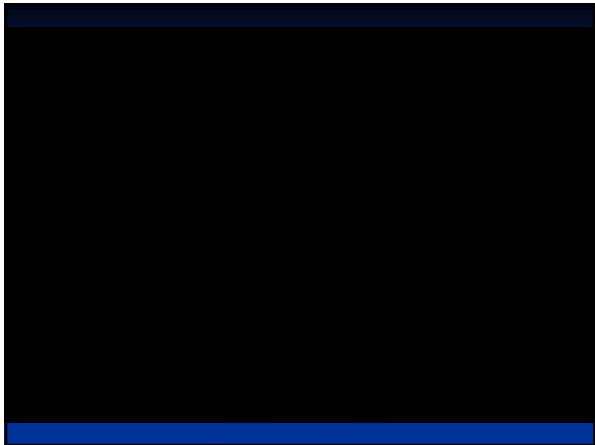
June 7 Tornado Outbreak

- 1723-1910: Approximately 60 additional spotter reports across Will and southern Cook Counties!

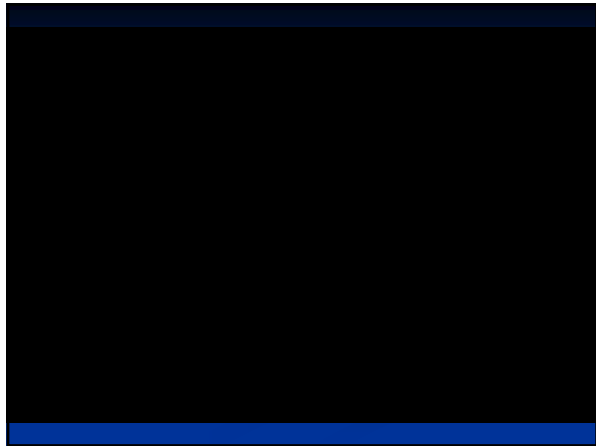
The radar image shows a large, intense storm system with a bright radar signature (red and yellow) indicating heavy precipitation and potential hail or large hail. The storm is moving across the region, with a distinct radar signature extending from the southwest towards the northeast.

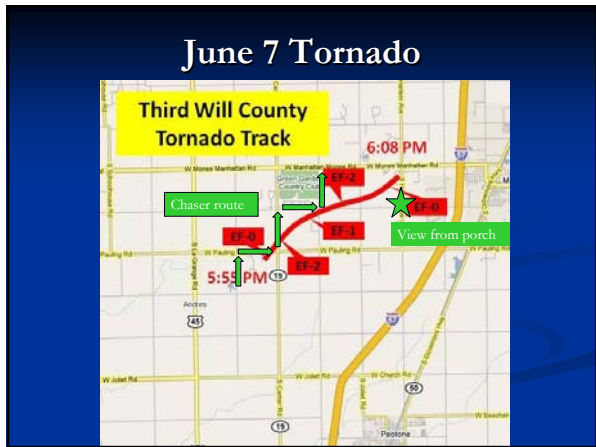














June 7 Tornado





Mobile Spotter/Chaser Safety

- Find a good, safe viewing position
 - Best – ahead of right flank (often SE)
 - Worst – upwind in heavy rain/hail core (often NE)
 - Behind the storm you may encounter strong RFD wind, debris. And you are always trying to catch up. Assume any downed power line is live!
 - If you get too close, debris or hail can fall from anywhere around the meso
 - Beware of rapid redevelopment in cyclic storms

June 7 Tornado event timeline

- 2009: All warnings expired.
- 0103: Watch canceled for far N IL.

June 7 Tornado Outbreak evening of the event

- 1900-2100: Severe Wx operations winding down
 - Sifting through damage reports
 - Preliminary info on web page
 - Look at next day staffing for damage surveys and more severe weather
 - Get materials ready for survey
 - Detailed Gazetteer or online maps
 - Cameras
 - EM phone numbers
 - GPS
 - EF-guide

June 7 Tornado Outbreak day after event - survey

- Organized three 2-man teams
 - NWS meteorologists
 - NWS SCEP or volunteer students
 - Other local meteorologists
 - EMA
- Mapped out areas of concern based on reports
 - Livingston-Kankakee-SW Will
 - Central Will
 - Monsee-IN State line

Purpose of Surveys

- Maintain accurate climatological database of storm events
- Determine tornado vs. wind damage
- If a tornado - determine beginning-end points and width of path, intensity of storm (EF scale)
- Evaluate watch, warning effectiveness
- Data used in case studies and training for staff
- Develop impact statements for major river floods

Tornado Determination

CSI Romeoville

- Atmospheric conditions conducive to tornadoes?
- Radar indications of rotation or classic downburst/straight wind signature?
- Spotter or credible eyewitness report of tornado?
- Photo or video evidence of tornado?
- Ground survey of damage and debris pattern

Tornado or Wind?

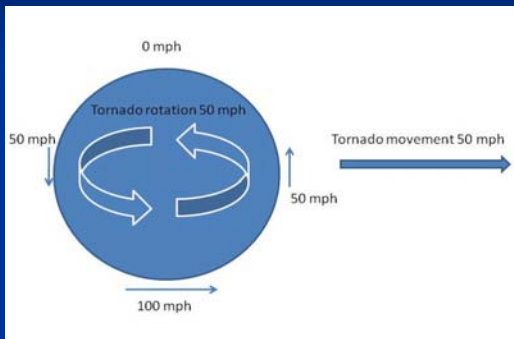
Tornado

- Narrow concentrated path
- Convergence
- Rotation
 - Objects, debris thrown to left of path
 - Mud or insulation plastered to back side of structure
- Evidence up uplift, objects or debris picked up and carried

Downburst/Straight Wind

- Wider more sporadic path
- sometimes divergent or "splat"
- Everything blown down in same direction
- Things blown down or blown over

A Small, Fast Moving Tornado Can Produce Damage Path Similar to a Microburst



Tornado Myths

- Trees, signs “twisted”
 - Tornado rotation on a broader scale
 - Asymmetric shape/weight of tree, dead or rotted tree could fall in direction other than motion of storm
- Tree tops sheared by funnel or “tornado aloft”
 - Friction allows for stronger winds at tree tops in both tornadoes and straight-line wind
- Roaring or freight train noise
 - Rotating or straight line winds – if strong enough, with debris - will both make a lot of noise
 - Smaller tornadoes without much debris may be stealth-like

Aerial Surveys

- Expensive and time consuming
- Reserved for high end tornado events
- Work with CAP or state government
- Can see breaks in path, swirl marks, variance in intensity or width of tornado



Survey Results

- Posted on weather.gov/chicago “Top News of the Day”
- Usually within 24 hours of event – large outbreaks may take several days to complete
- Posted surveys generally include
 - Description of damage path and intensity (EF rating)
 - Map of damage path
 - Radar, and other meteorological support
- Everything is “preliminary” until submitted to StormData 60 days after the end of the month

Thanks to

- Darrell and Joel Swanberg
- Adam Lucio
- Amy Pavlik
- Gino Izzi
- “winterscenefreak”

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