Emerging Technologies in the Field in Support of Operations and Research

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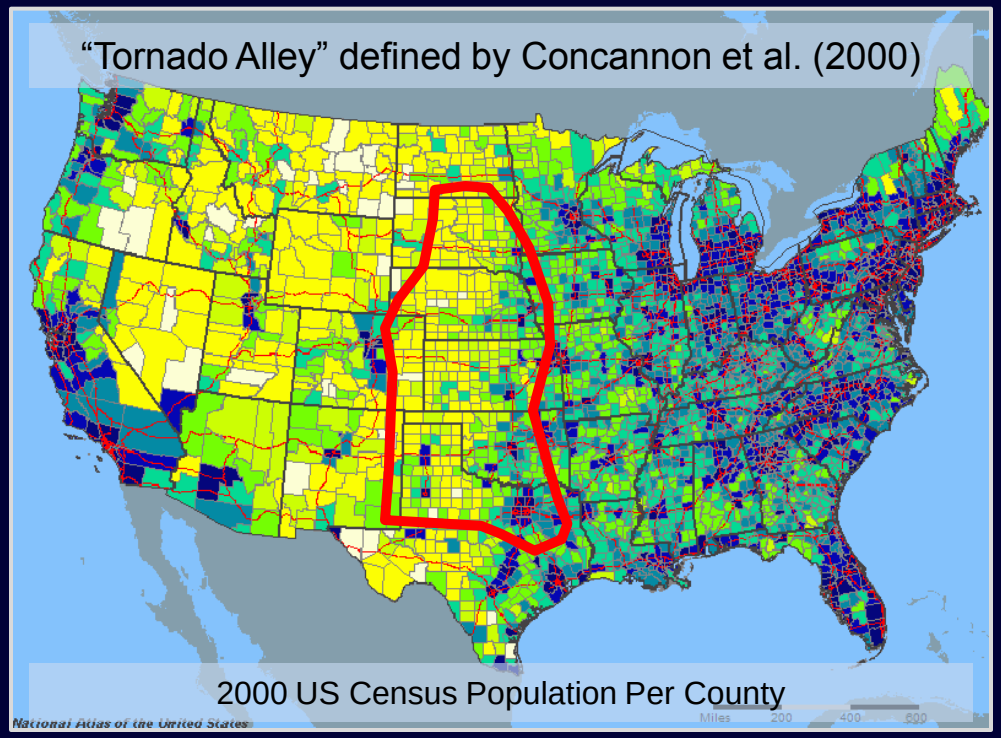


History . . .

- Prior to this decade, great difficulty to call/send in *real-time* reports
- Communication limited by existing technology
- Flow of information severely hampered/delayed in rural areas
- Sharing images of storms with NWS on the order of days

Effective communication between NWS and those "witnessing" severe weather leads to successful severe weather operations and better end products

So, where's the pay phone 25 miles SW Hays, KS?

Today . . .

- Continued advances in technology, specifically cell phone/broadband cards
  - *Creates new tools and possibilities*

- Influx of mobile storm observers (most cases, highly educated)
  - *Greatest density April–June (includes rural areas)*

- Wealth of information/data now possible to obtain in real-time

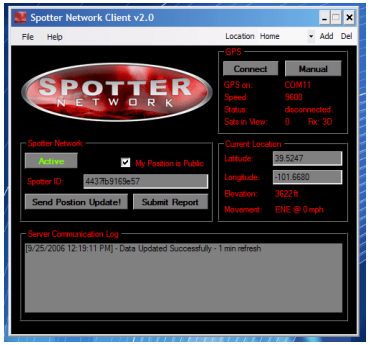
Emerging Technologies in the Field

- ✓ **Spotter Network**
- ✓ **MRESS**
- ✓ **Live Chase Cams**

Outline and Flow of Information of a Tech-Savvy Storm Observer

Laptop

GPS



SN GUI

Mobile Obs

Mobile Video

Internet via Cell Phone or Broadband Cards

Research Projects Field Coordinator

National Weather Service WFOs

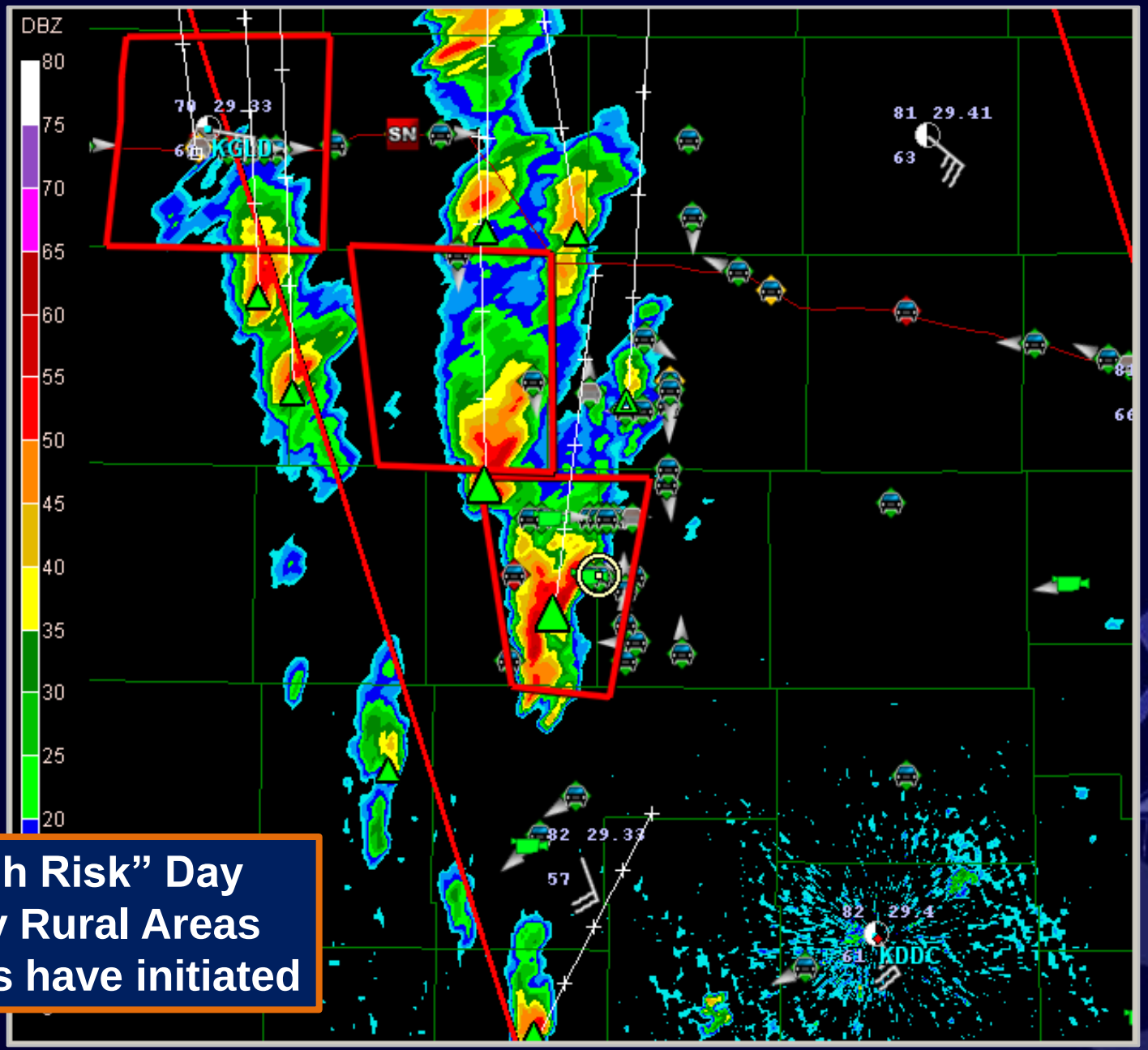
Spotter Network

Spotter Network Overview

- Introduced in 2006 (first full year 2007)
- Designed to improve flow of real-time information w/out taxing human resources (both field and NWS persons)
- Mobile storm observers are an excellent resource for real-time severe reports
- Serves as a communication bridge between storm observer and NWS through the eSpotter program, at no cost to observer or the NWS

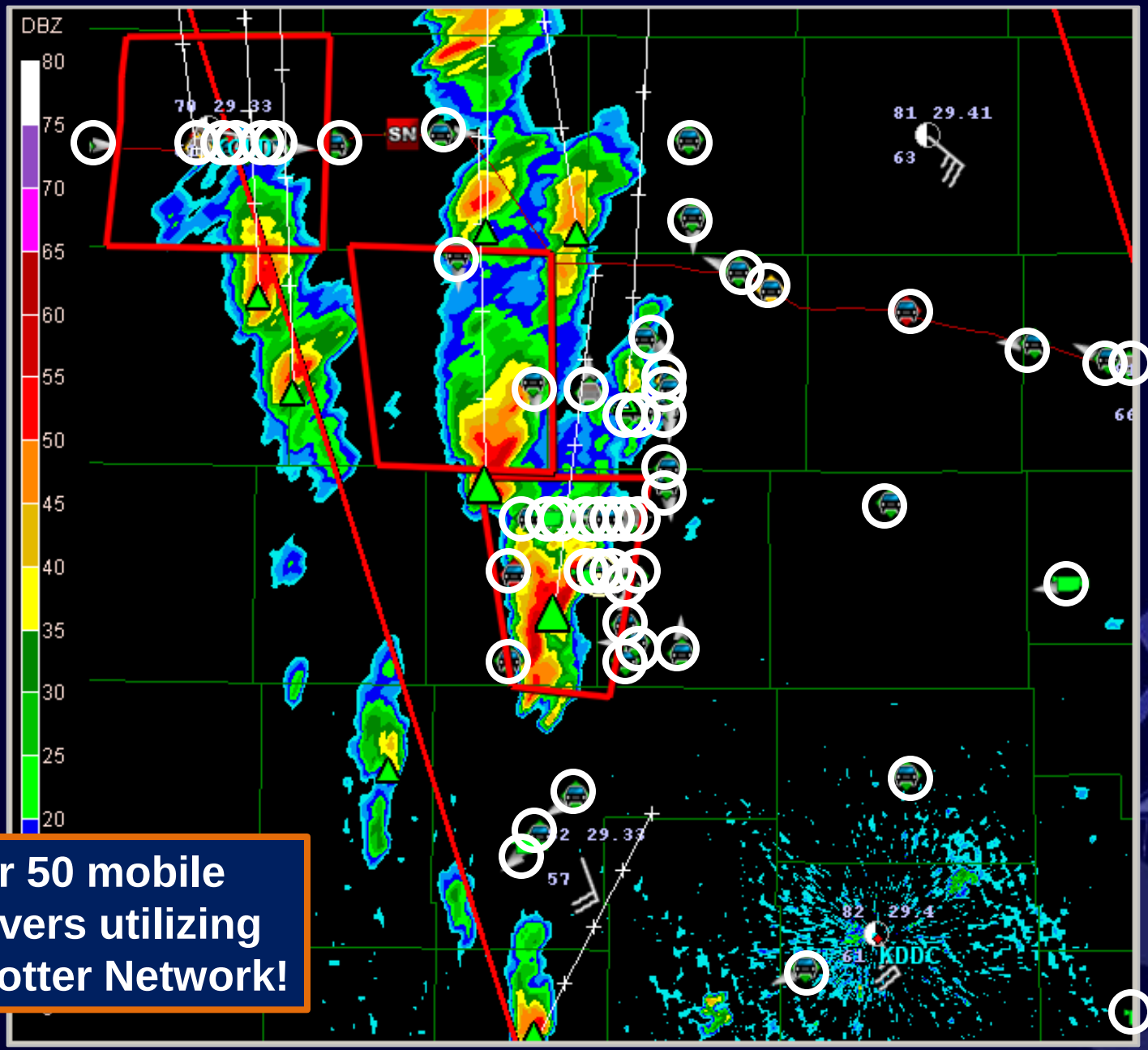
- *Less than 45 seconds* from the field to arriving in NWS eSpotter
- Provides NWS the storm observer's contact information (cell phone, email)
- Precise location of storm observer and location/type of severe event

22 May 2008 – Western Kansas



“High Risk” Day
Very Rural Areas
Storms have initiated

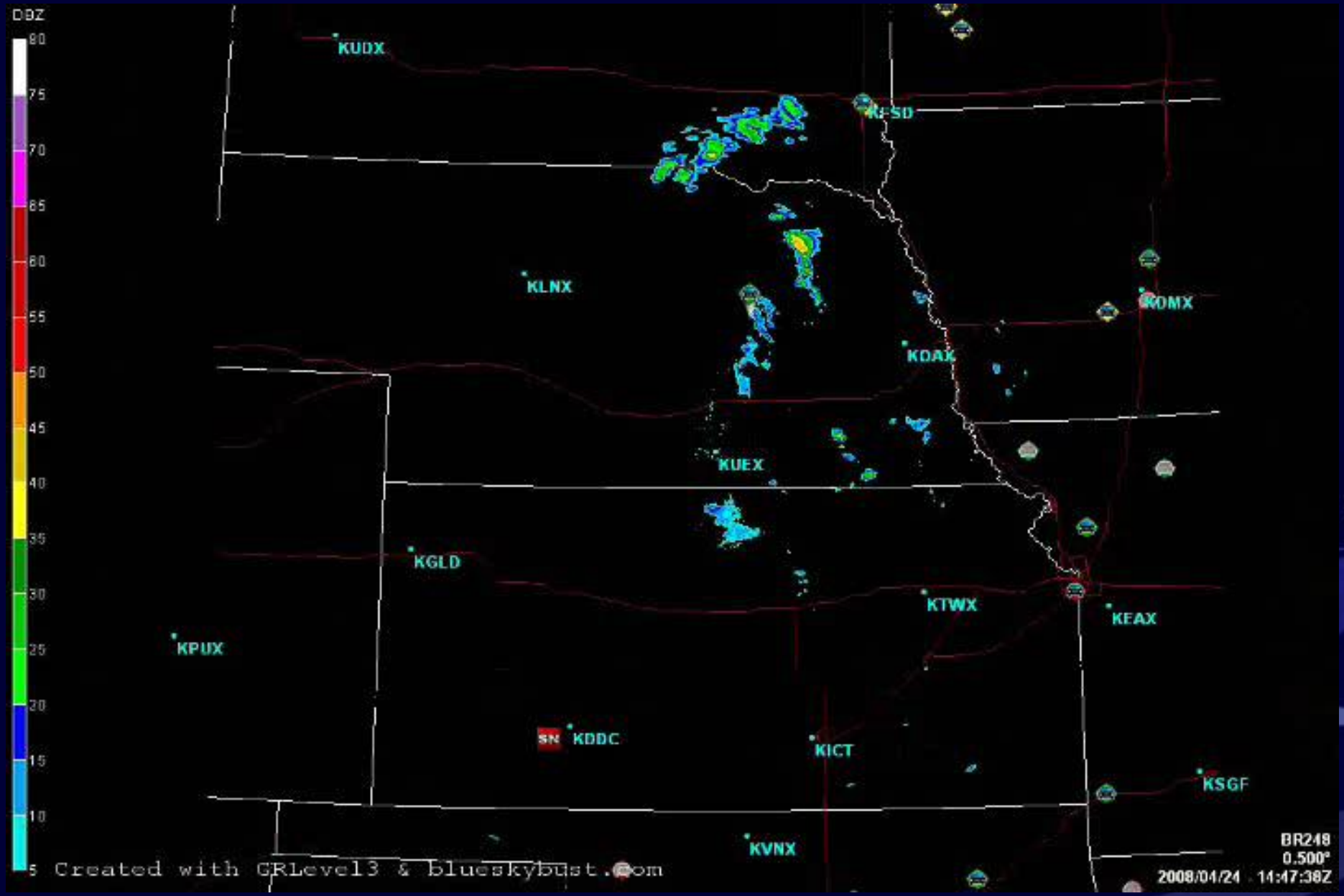
22 May 2008 – Western Kansas



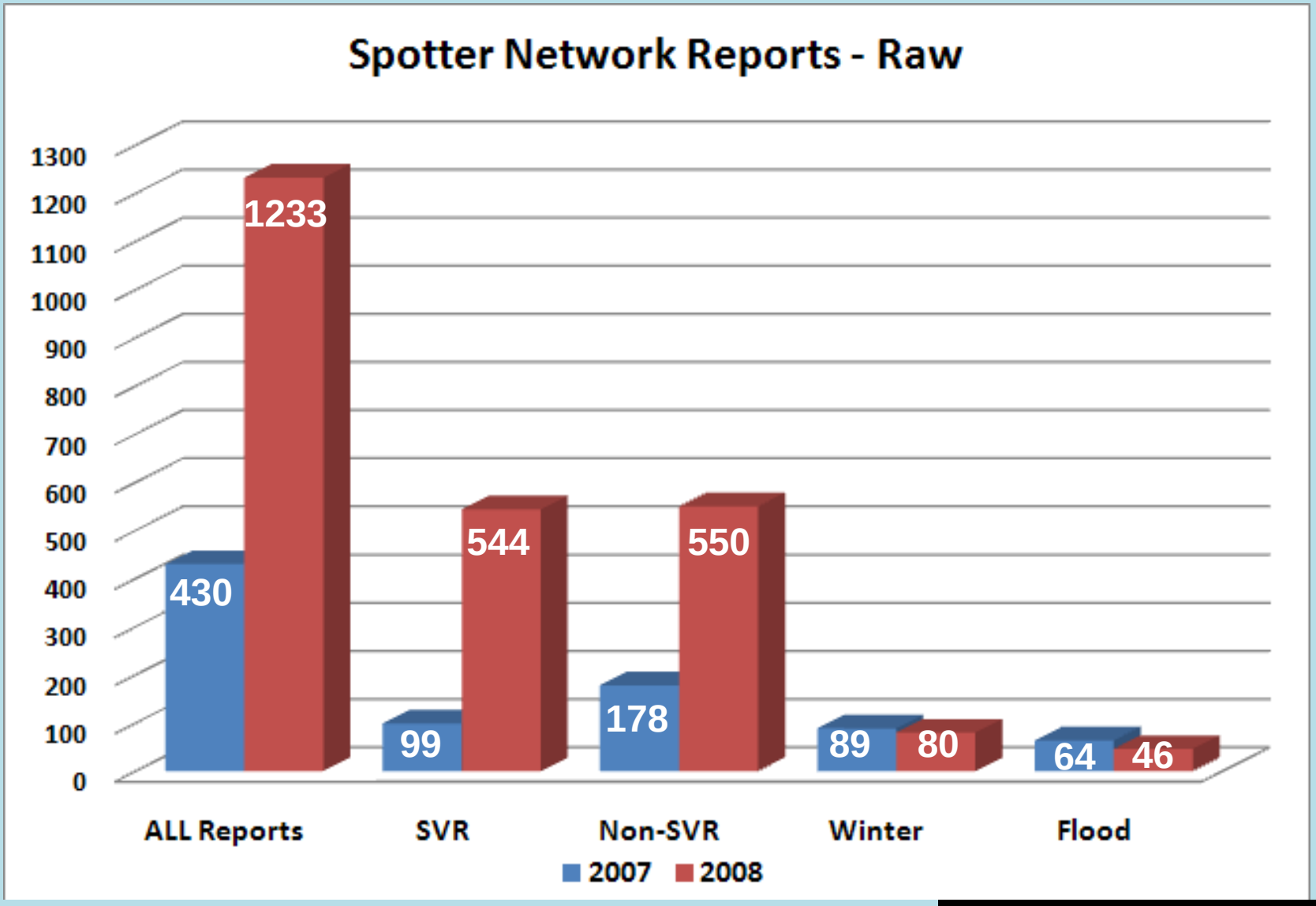
Over 50 mobile observers utilizing the Spotter Network!

Spotter Network in Action

24 April 2008 – Long Lived Supercell / EF2 Nighttime Tornado

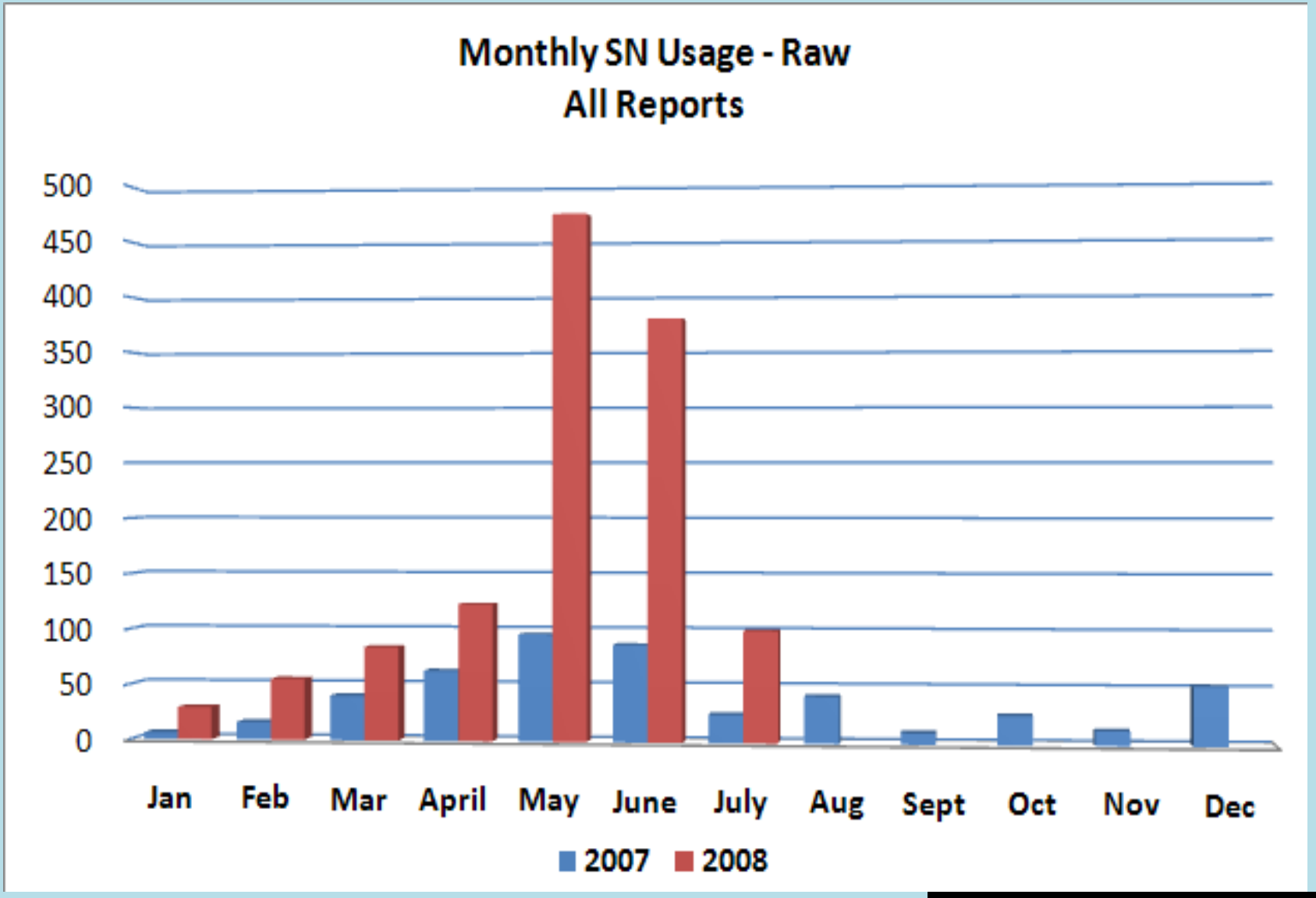


Distribution of Spotter Network Reports



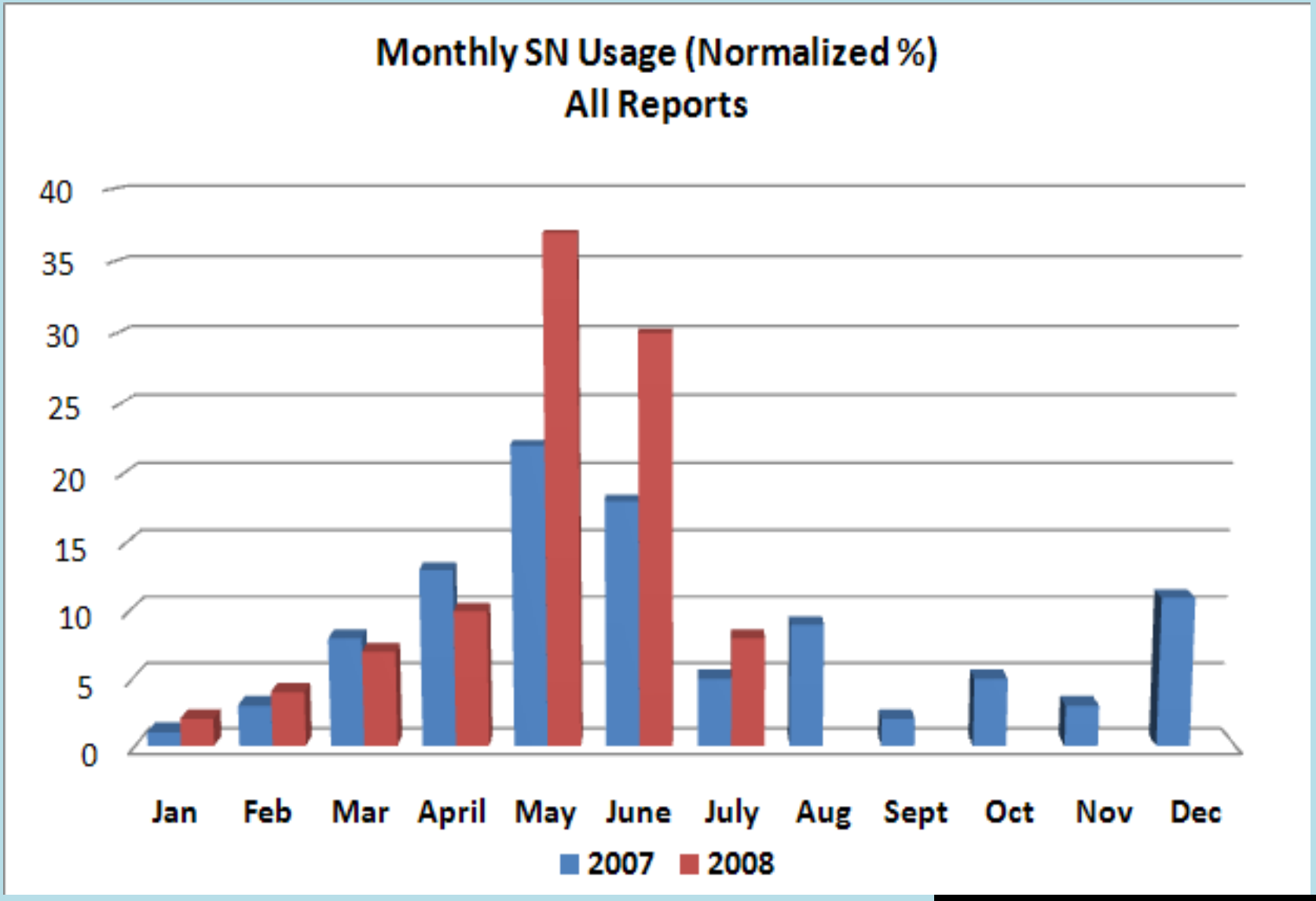
2008 Reports Through 5 August

Distribution of Spotter Network Reports



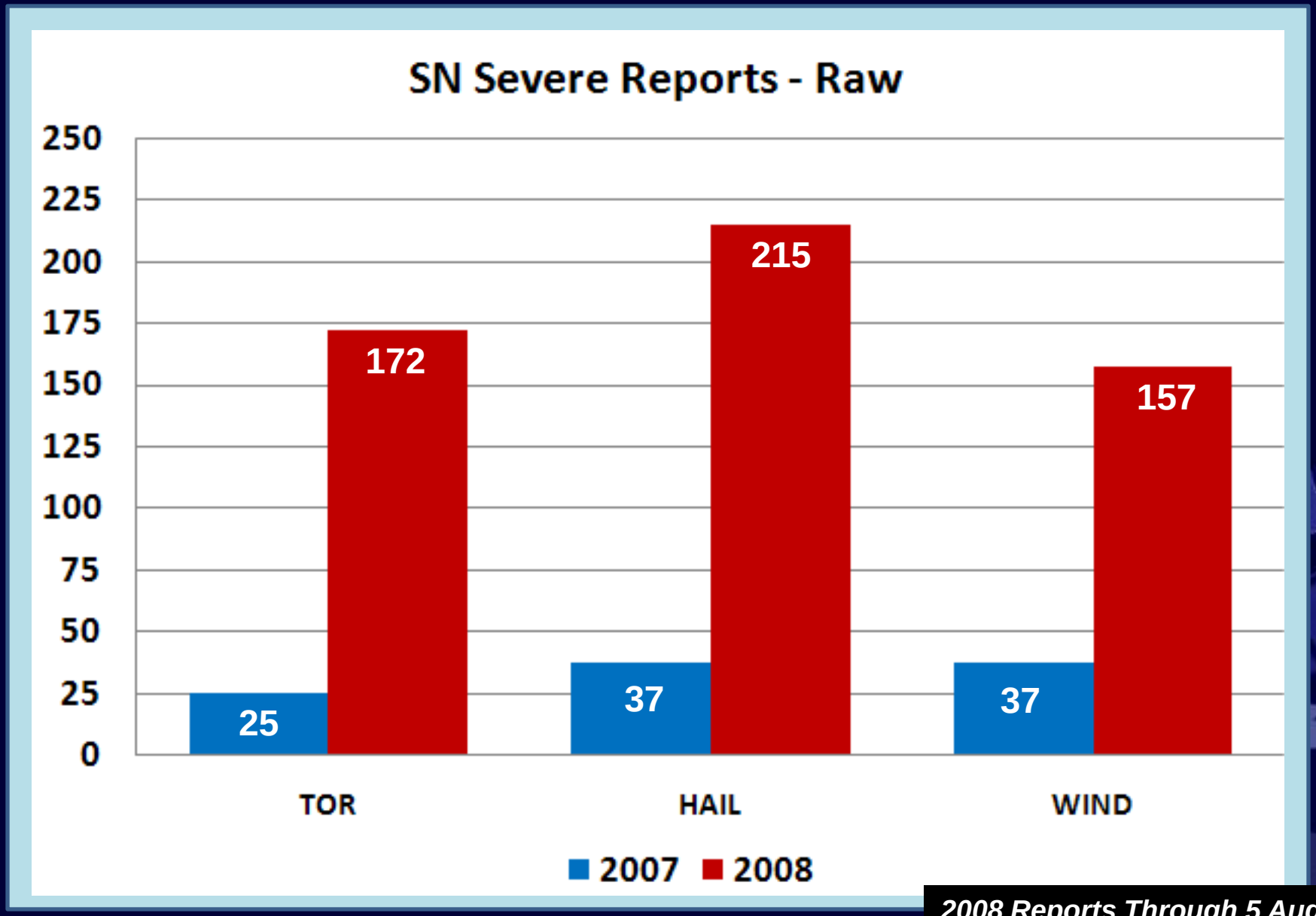
2008 Reports Through 5 August

Distribution of Spotter Network Reports



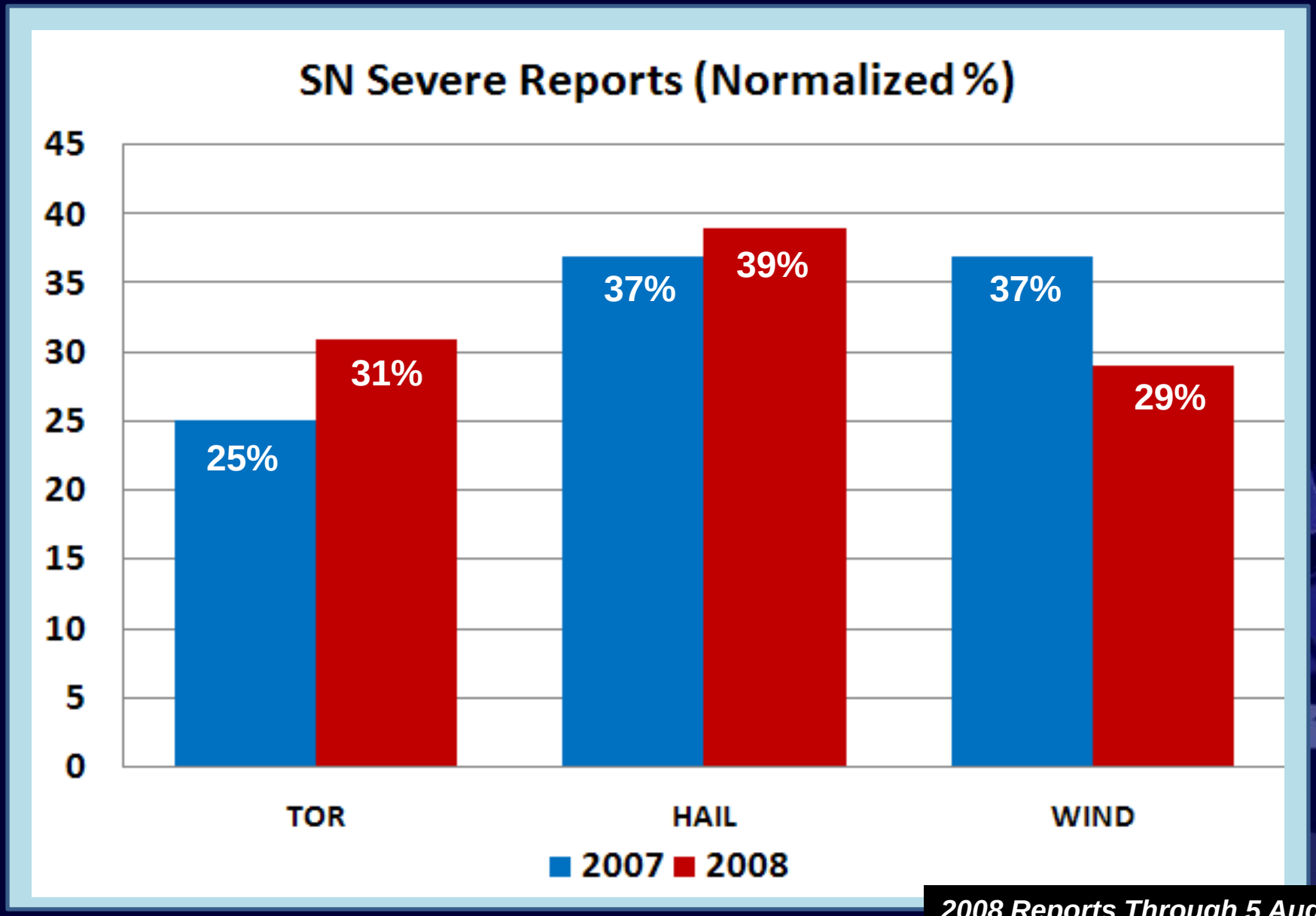
2008 Reports Through 5 August

Distribution of Spotter Network Reports



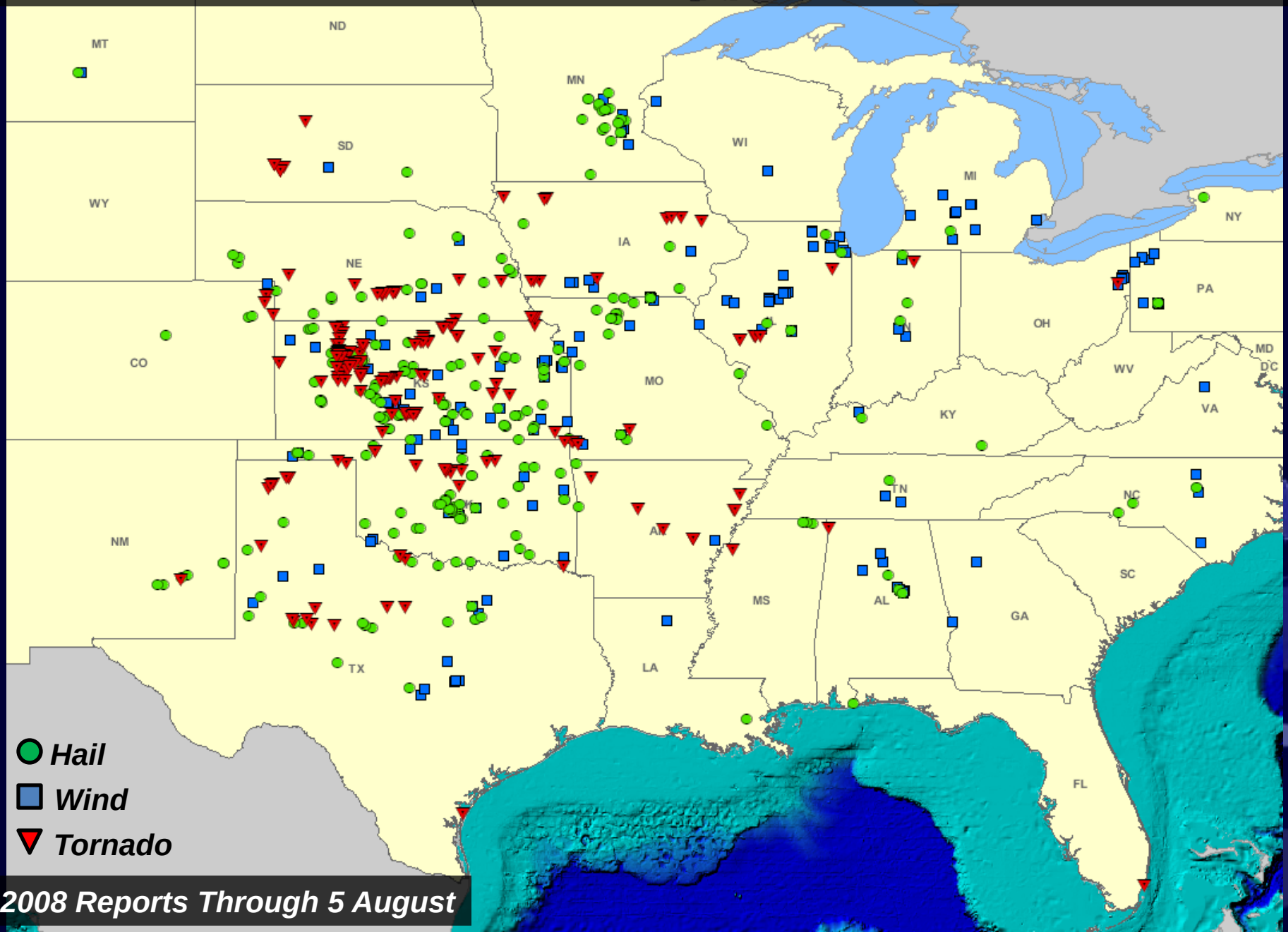
2008 Reports Through 5 August

Distribution of Spotter Network Reports

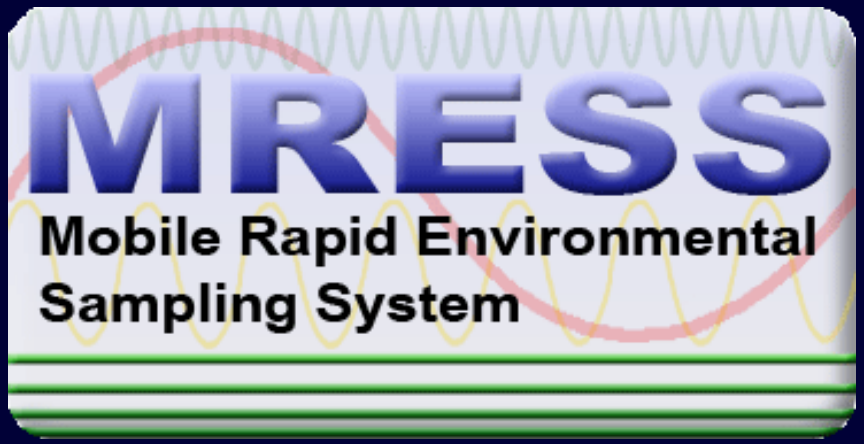


2008 Reports Through 5 August

2007–2008 All Severe "LSR-Ready" SN Reports



2008 Reports Through 5 August



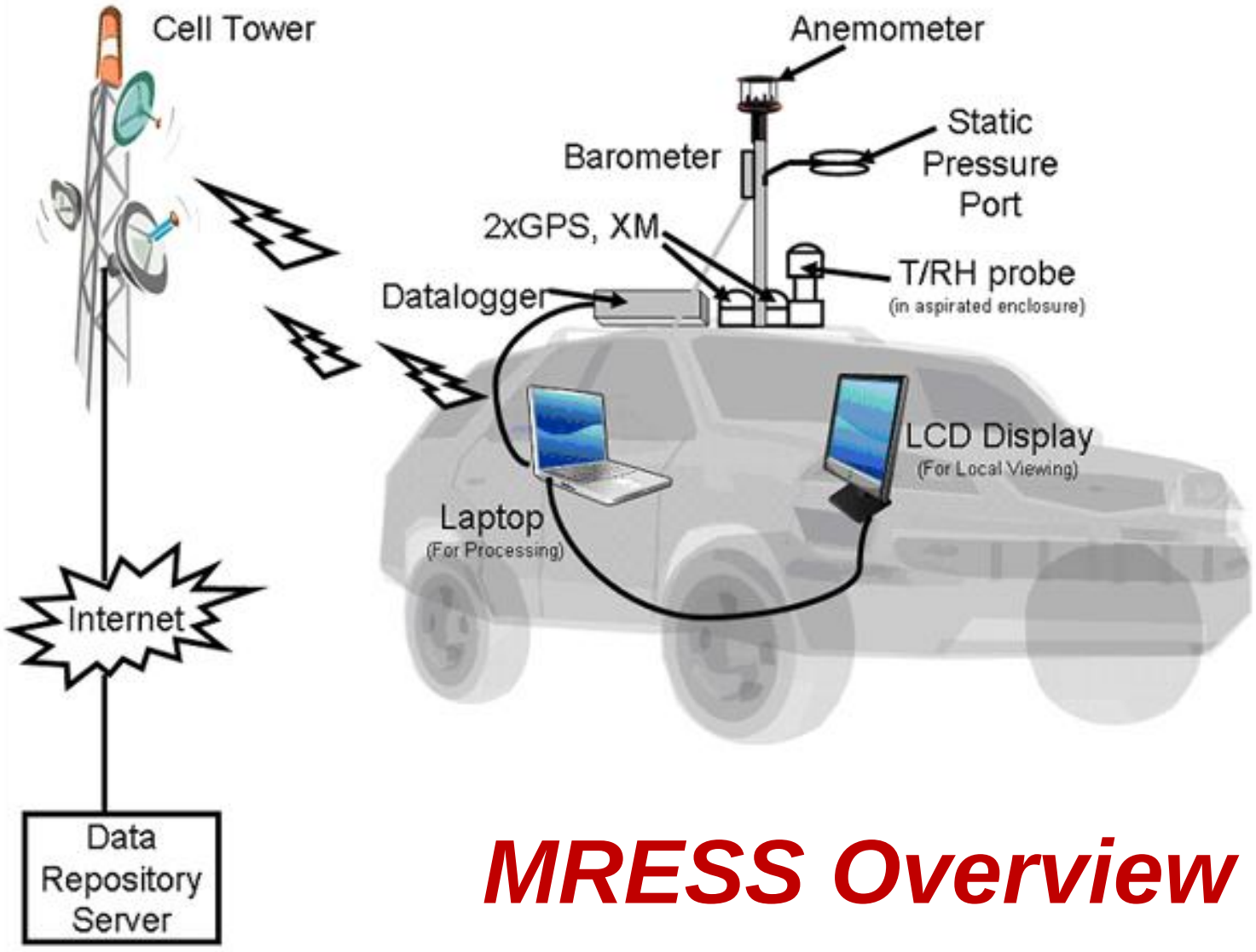
MRESS

Mobile Rapid Environmental Sampling System

- Introduced in 2008
- Remote, mobile weather observations funneled to a central data repository for external web access
- MM participants with properly mounted, scientific-grade instrumentation
- Available in real-time (MRESS repository, GRlevel placefile)
- Increased resolution in microscale storm environment and data sparse regions
- Great value in the warning decision process
- Research field projects can immediately assist operational community and supplement own observations with other MRESS participants for formal studies

Mobile Rapid Environmental Sampling System

MRESS
Mobile Rapid Environmental Sampling System

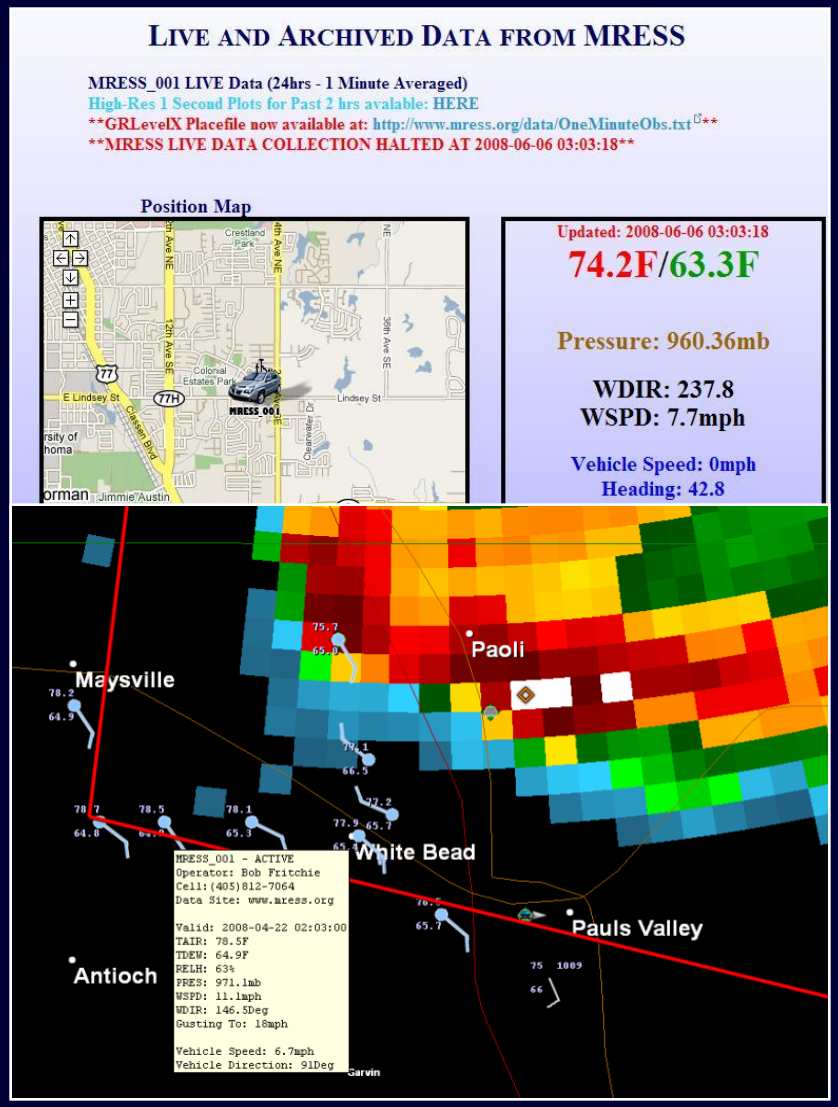


MRESS Overview

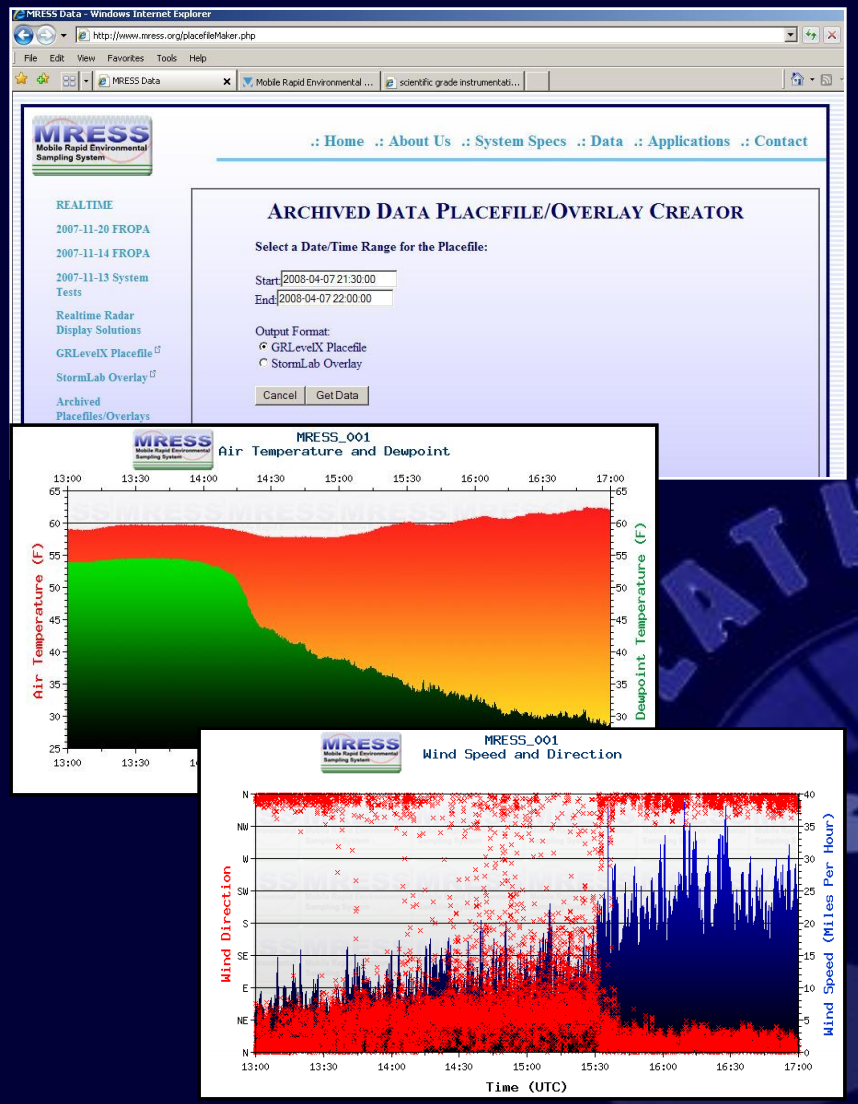
Mobile Rapid Environmental Sampling System

MRESS
Mobile Rapid Environmental Sampling System

Real-Time Monitoring



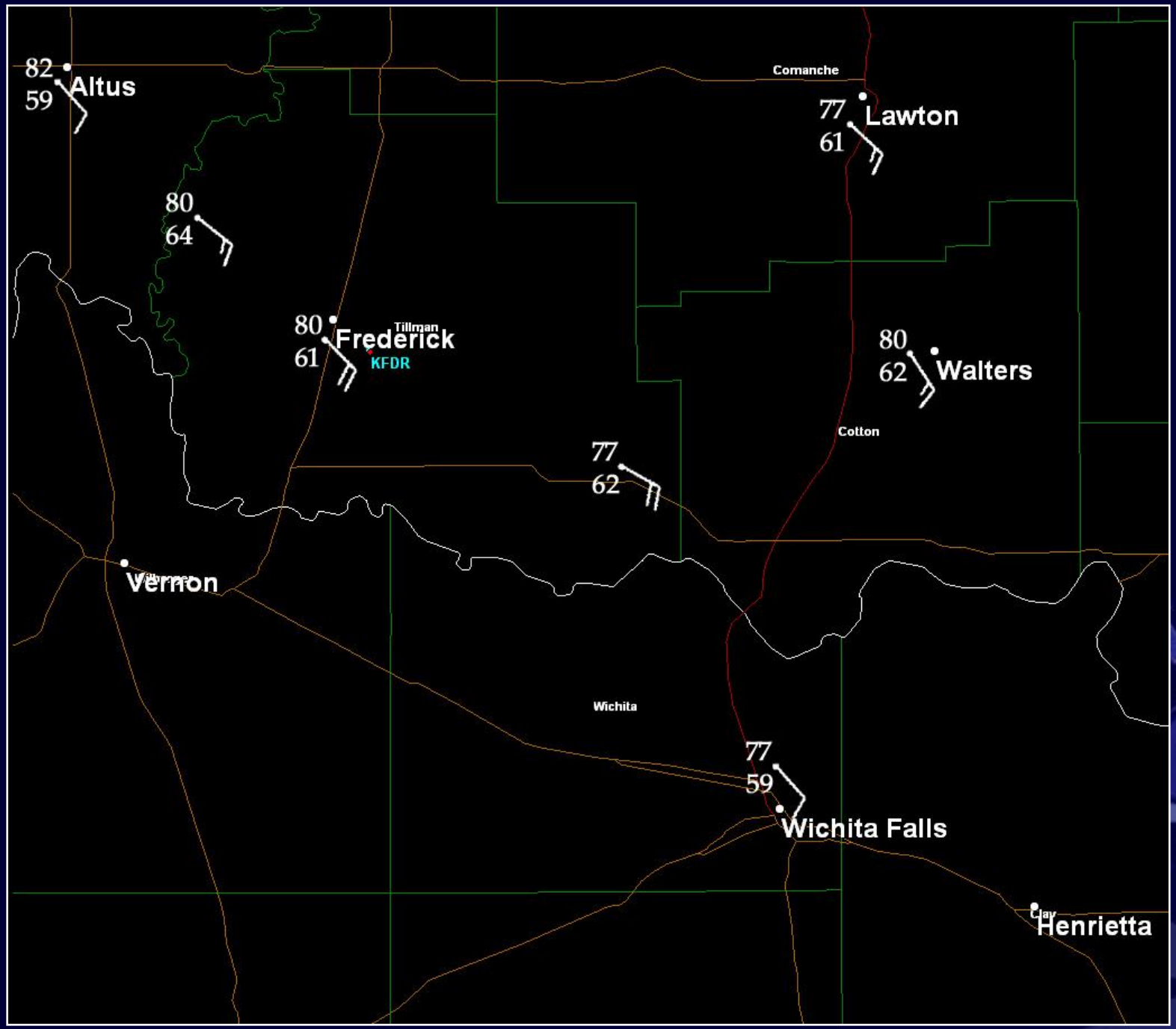
Archived Capabilities



MRESS
Mobile Rapid Environmental Sampling System

Example #1

7 April 2008
Electra, Texas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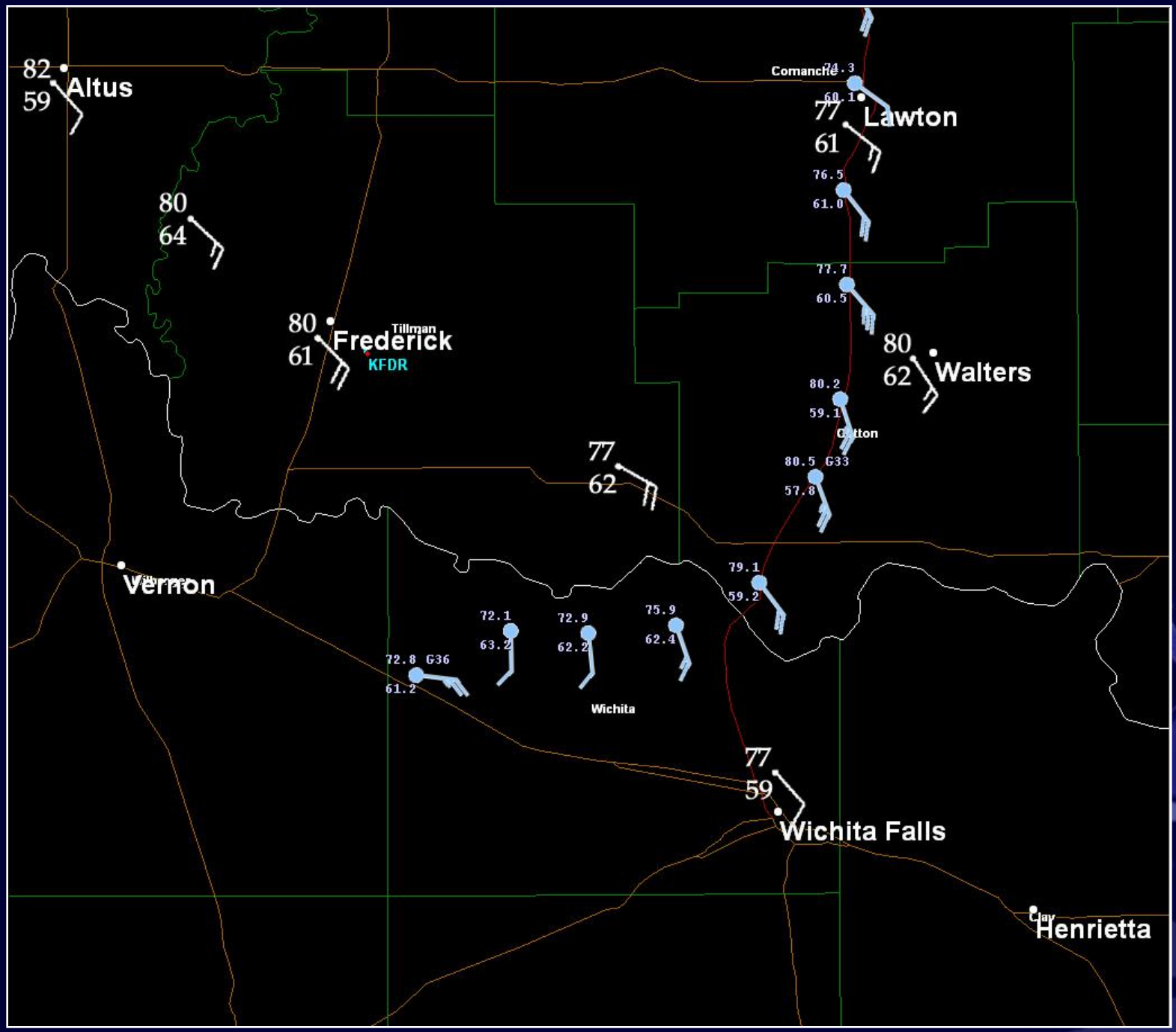
Wichita Falls
Clay
Henrietta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75.9
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Wichita
79.1
59.2
80.5 G33
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80.2
59.1
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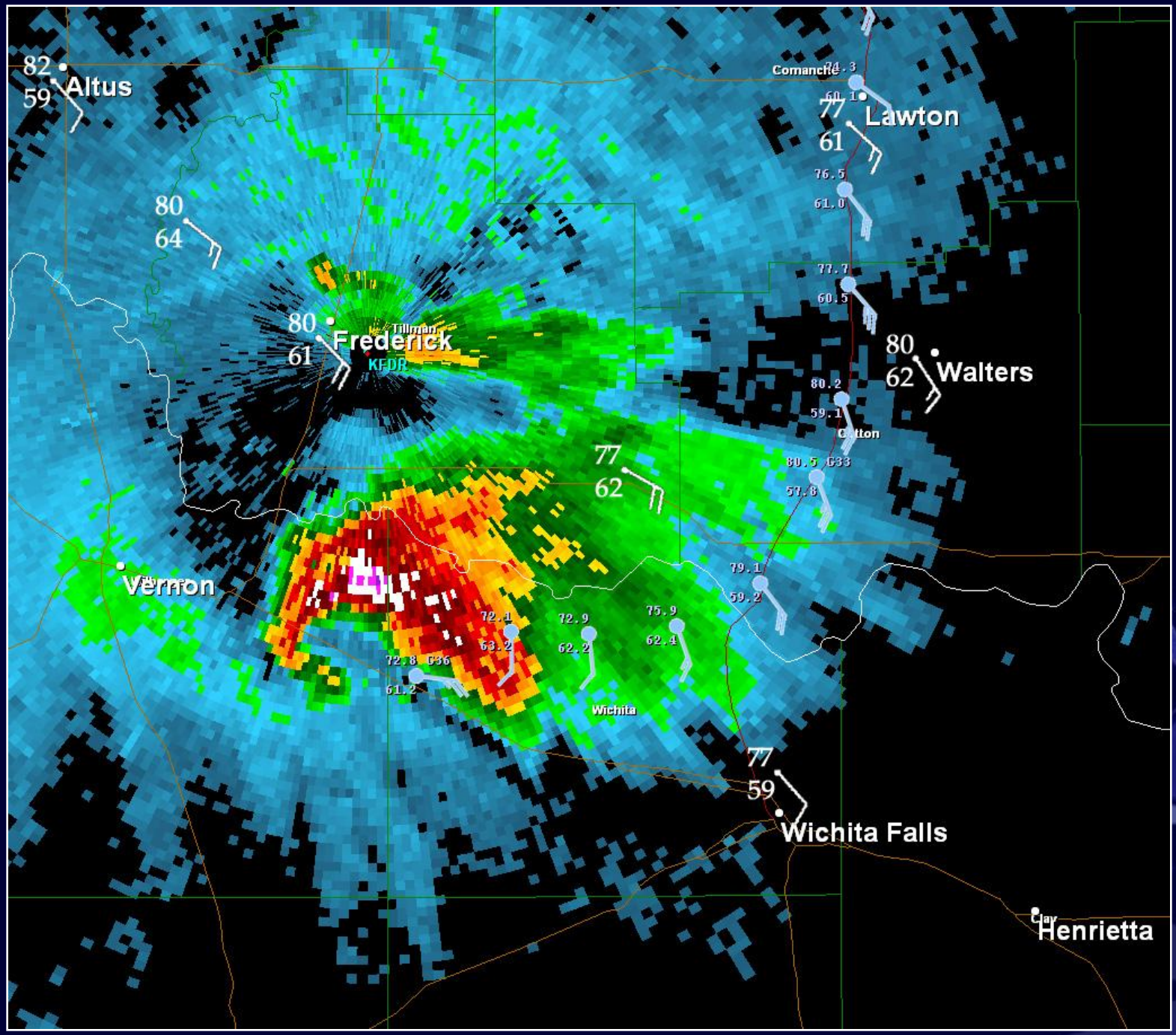
Wichita Falls
Henrietta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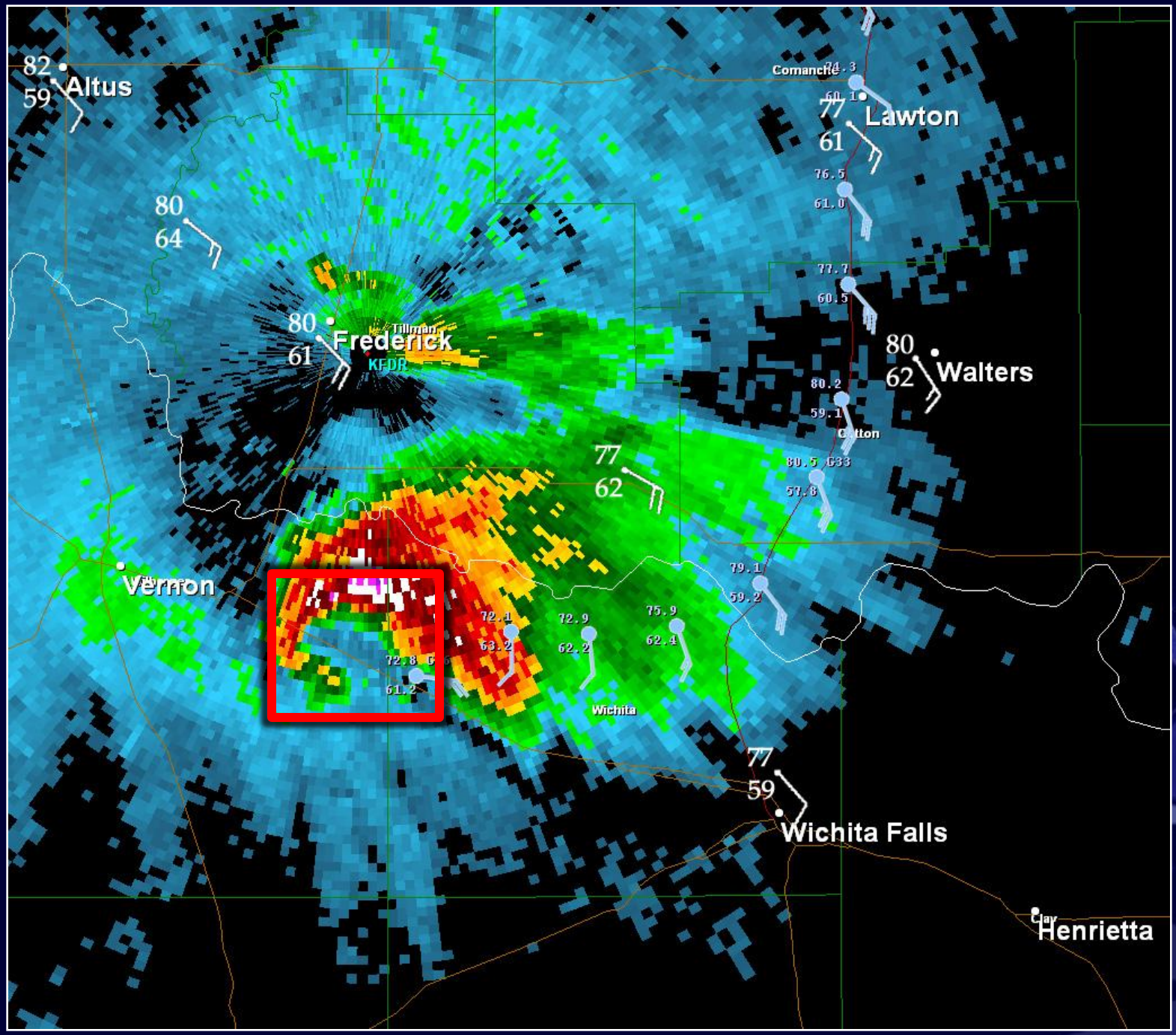
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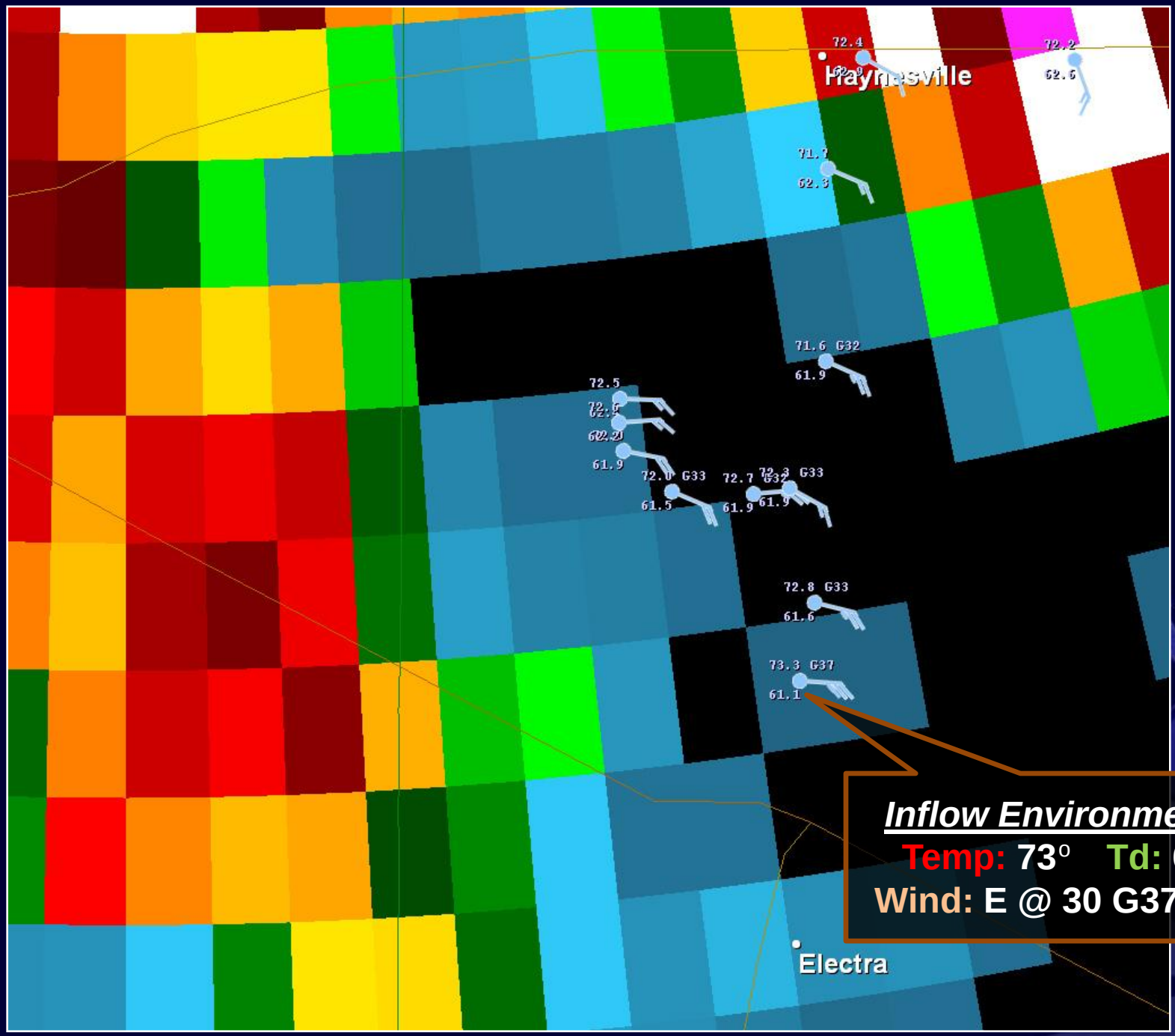
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Haynesville
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71.7
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71.6 G32
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72.0 G33
61.5
72.7
72.3 G33
G32
61.9
61.9
72.8 G33
61.6
73.3 G37
61.1
Electra
Inflow Environment:
Temp: 73° Td: 61°
Wind: E @ 30 G37 mph

Live Chase Cams

Live Chase Cams

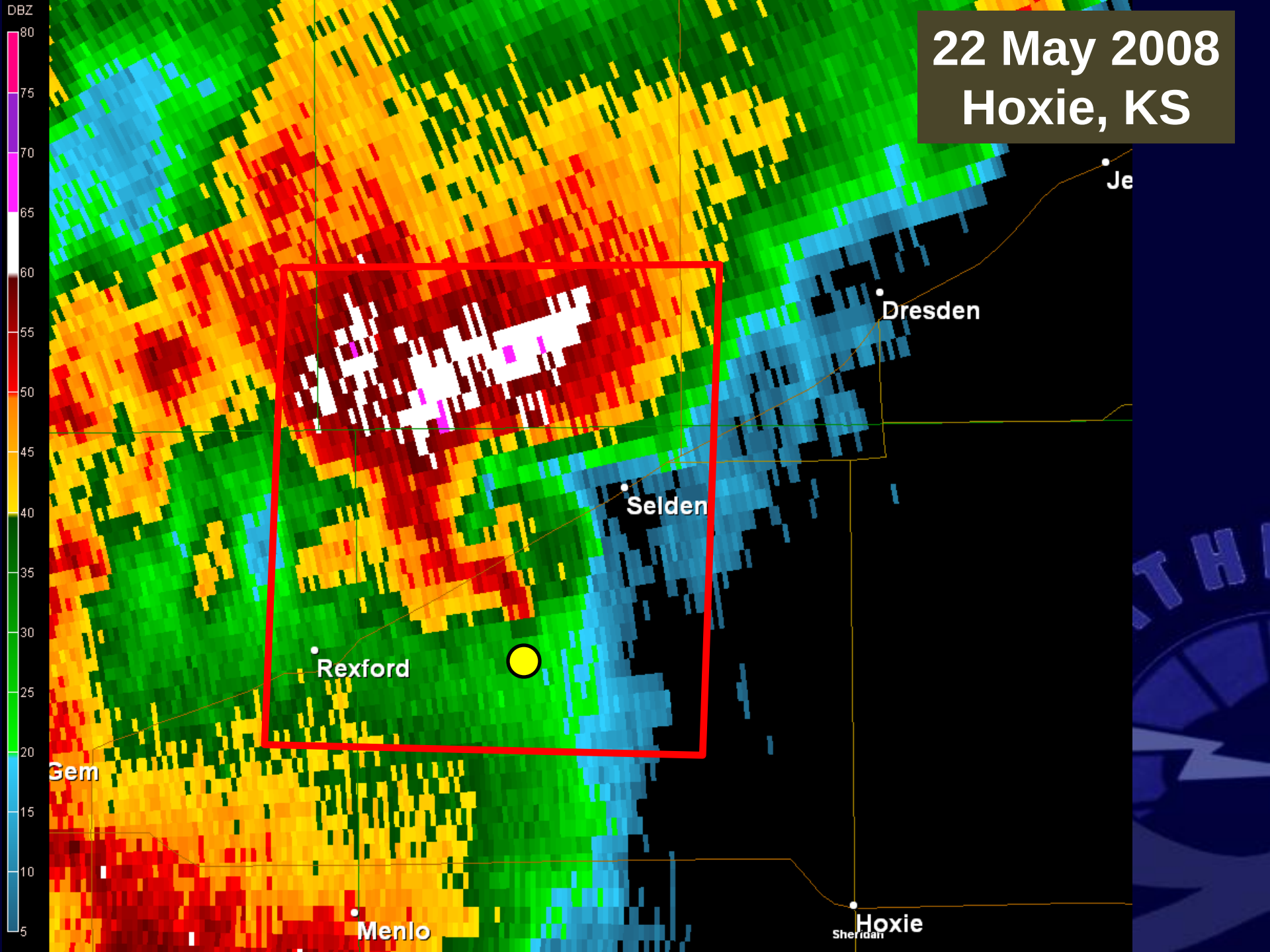
Live Chase Cams Overview

Live Chase Cams

- Popularity and availability rapidly increased in 2008
- Streaming video feed from video camera through mobile internet applications to designated web page
- Free to the public to view online in real-time (video hosted by: Severe Studios, personal web pages)

Huge potential to support the warning decision process!

- The ultimate ground-truth tool for severe weather operations
- Real visualization of storm structure with radar data = excellent awareness
- Helps limit “guessing-game” of questionable or lack of reports
- Old proverb…*a picture (or video) is worth a thousand words*


22 May 2008
Hoxie, KS
DBZ
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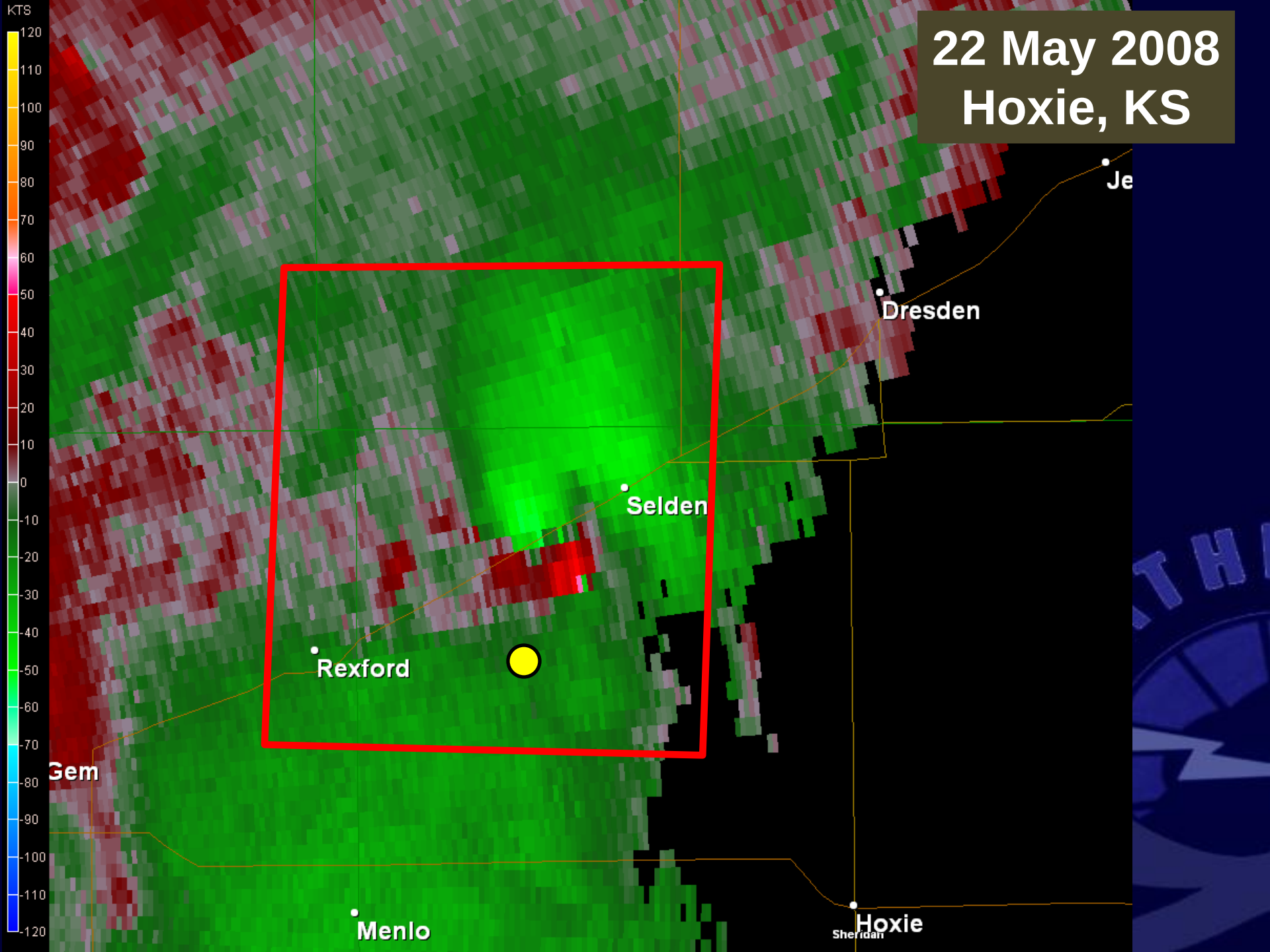
Dresden
Selden
Rexford
Gem
Menlo
Hoxie
Sheridan


22 May 2008
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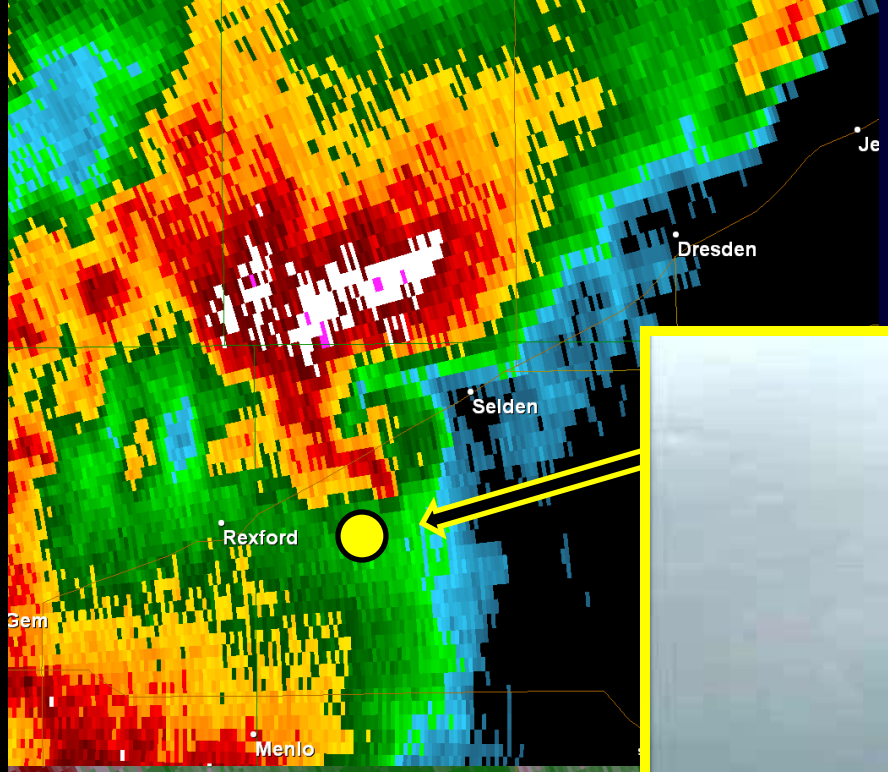
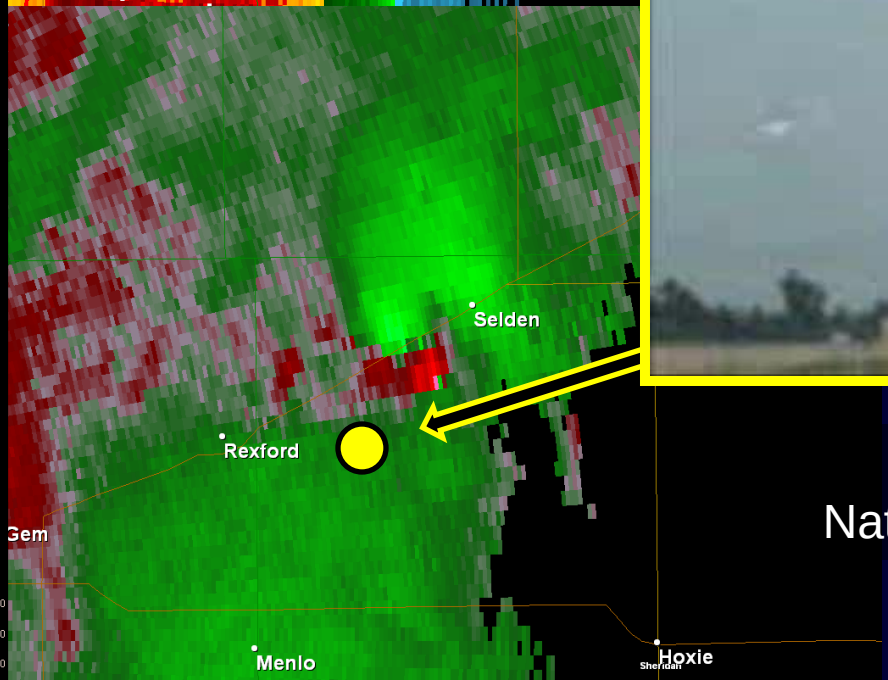
Menlo
Hoxie
Sheridan

22 May 2008
Hoxie, KS

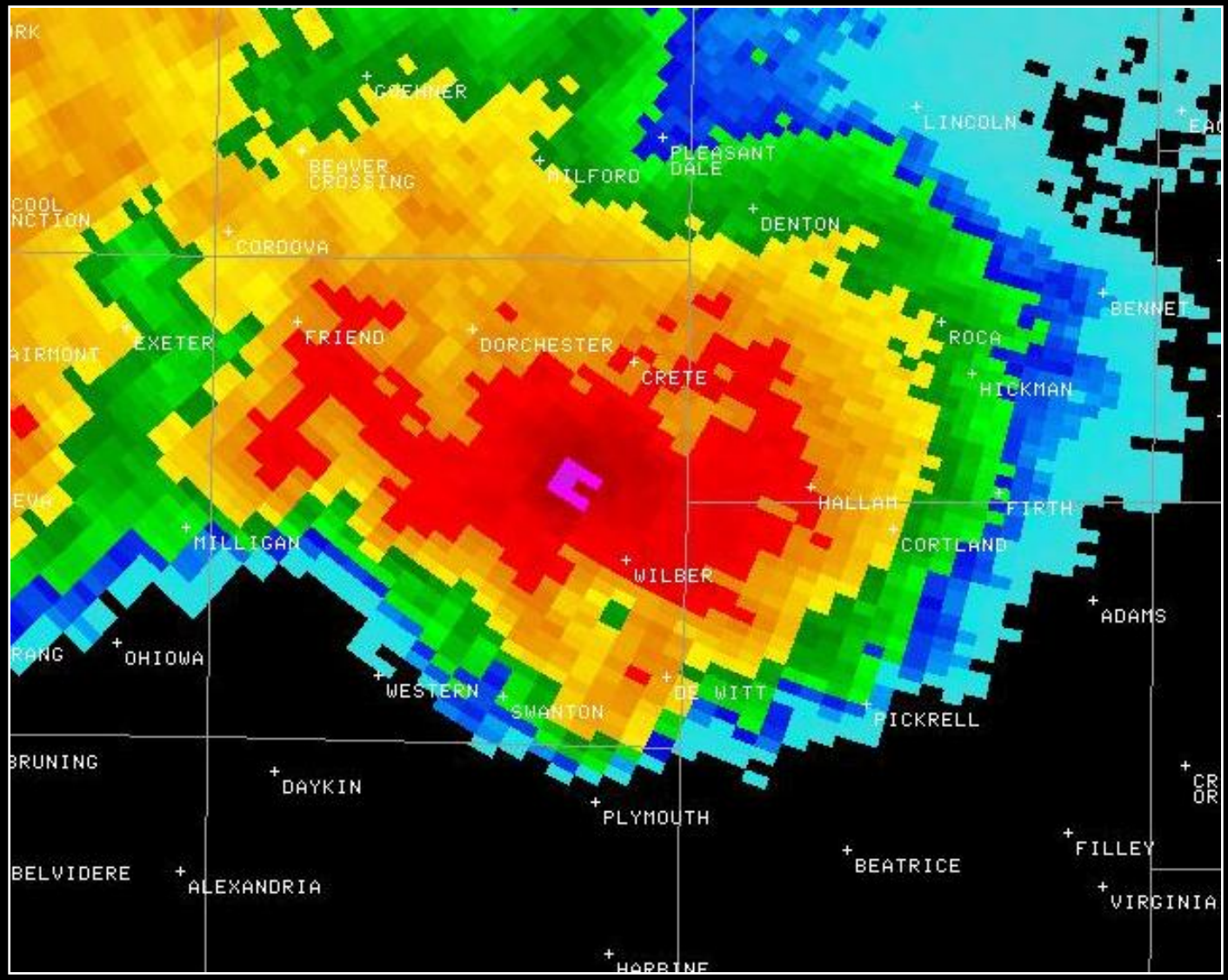




As viewed real-time from the
National Weather Service Goodland, KS

Summary

- Spotter Network, MRESS, and Live Chase Cams incorporated into one location
- Field technologies are likely to be available during moderate/large events
  - ✓ Influx of highly educated storm observers peak April–June
- Majority of mobile storm observers *best* resource for high-end information
- Excellent tools to increase situational awareness (and free to monitor)
- Provides support/confidence to the warning decision process
- Local WFO offices must choose to dedicate resources to monitor wealth of information
- Immediate observations/reports along with visual confirmation
  - ✓ Technologies will revolutionize methods of obtaining “ground-truth” in real-time


RK
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EVA
RANG
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BELVIDERE
GREENWOOD
BEAVER CROSSING
MILFORD
PLEASANT DALE
LINCOLN
DENTON
CORDOVA
EXETER
FRIEND
DORCHESTER
CRETE
ROCA
BENNET
HICKMAN
HALLAM
FIRTH
CORTLAND
MILLIGAN
WILBER
ADAMS
OHIOWA
WESTERN
SWANTON
DE WITT
PICKRELL
DAYKIN
PLYMOUTH
FILLEY
BEATRICE
ALEXANDRIA
VIRGINIA
HARBINE

Live MRESS

Operator: Bob Fritchie
www.mress.org

Valid: 2009-5-23 (2332UTC)

Temp/Td: 76/63

Severe Wind Gust
Wind: 63.2 mph
Dir: 290 deg

Prelim data, WFO calls welcome

KD5KOW – Active
Scott Blair
2009-5-23 2344 UTC
STATIONARY
Phone: 785-123-4567
Note: Off-Duty NWS