Enriching the Modern Day STORMSPOTTER
Through Technology & Education Enhancements

By Joshua J. Jans & Dr. Cecil Keen
STORM SPOTTERS

“Volunteers who help keep communities safe by providing timely and accurate reports of severe weather”
Communities across the country have become increasingly vulnerable to severe weather events.

- 551 Fatalities
- 7 Separate Billion $ Disasters
- 6 EF-5 Recorded!
- $25.6 Billion Alone!
2011 will be remembered as one of the deadliest, most devastating, and costliest seasons in modern day history.
Spotter Role

Continue to play a pivotal role in the warning process for the National Weather Service (NWS), the Emergency Management Community, and Broadcast Meteorologists.

Amateur Radio

Volunteer Citizens

Storm Chaser

Emergency Management

Law Enforcement

Firefighters & Rescuers

Wednesday, February 22, 12
continue to play a pivotal role in the warning process for the National Weather Service (NWS), the Emergency Management Community, and Broadcast Meteorologists.
Over 240,00+ storm reports were transmitted via the NWS through LSRs from 2005 to 2011*.

Note: Averages based on all LSR’s transmitted by the NWS’s offices.
Over 240,000+ storm reports were transmitted via the NWS through LSRs from 2005 to 2011.

- Spotter Community: 60%
- Unidentified Source: 15%
- The Public: 15%
- ASOS - MESONET: 5%
- News Media: 3%
- Other: 2%

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Over 240,000+ storm reports were transmitted via the NWS through LSRs from 2005 to 2011.

[Bar chart showing storm reports by source and type from 2005 to 2011.]

- **Citizen Volunteers**: Largest source of reports, with significant contributions from wind damage, hails, wind gusts, and tornadoes.
- **Law Enforcement**: Significant in风 damage and hails.
- **Emergency Manager**: Moderate contributions from all types.
- **Amateur Radio**: Small contributions across the board.
- **NWS Office**: Primarily for wind damage and hails.
- **Weather Observers**: Small contributions.
- **County Official**: Small contributions.
- **Fire Department**: Small contributions.
- **Storm Chasers**: Small contributions.
- **Dispatchers**: Small contributions.

*Note: Averages based on all LSR's transmitted by the NWS's offices.*
NWS Volunteer Program for Severe Weather Spotters
Presently operates in a fragmented manner highlighting challenges in reporting, training, and registration.

**Spotter Coverage**

1945 to Present

Evolution of Spotter Coverage from 1945 to Present Day

Online @ SKYWARN.org

SKYWARN Spotters:

~300,000

(true number unknown)
Presently operates in a fragmented manner highlighting challenges in reporting, training, and registration.

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Dude, where do I send my report?

- Local NWS Phone
- Local NWS Email
- Local NWS Web Form
- CoCoRaHS Community Collaborative Rain, Hail and Snow
- NPOP National Public Observation Program
- eSpotter
- Twitter
Reporting Headaches

Dude, where do I send my report?

Amateur Radio

CoCoRaHS

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Modernization efforts have been in progress since 2008.
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Severe Hail and Winds

Hail: NWS issues a severe thunderstorm warning for hail of 1” or larger. When reporting hail, it is best to measure it with a ruler or other tool. Hail size can be related loosely to coins or athletic balls.

<table>
<thead>
<tr>
<th>Object</th>
<th>Diameter (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>1/8</td>
</tr>
<tr>
<td>Pea</td>
<td>1/4</td>
</tr>
<tr>
<td>Dime</td>
<td>1/8</td>
</tr>
<tr>
<td>Penny</td>
<td>3/4</td>
</tr>
<tr>
<td>Nickel</td>
<td>7/8</td>
</tr>
<tr>
<td>Quarter</td>
<td>1”</td>
</tr>
<tr>
<td>Half Dollar</td>
<td>1”</td>
</tr>
<tr>
<td>Walnut or Ping-Pong Ball</td>
<td>1”</td>
</tr>
<tr>
<td>Golf Ball</td>
<td>1”</td>
</tr>
<tr>
<td>Lime</td>
<td>2”</td>
</tr>
<tr>
<td>Tennis Ball</td>
<td>2 1/2”</td>
</tr>
<tr>
<td>Baseball</td>
<td>2 3/4”</td>
</tr>
<tr>
<td>Large Apple</td>
<td>3”</td>
</tr>
<tr>
<td>Softball</td>
<td>4”</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>4”</td>
</tr>
</tbody>
</table>

Wall Cloud: A wall cloud is an isolated lower cloud attached to the base and below the main storm tower. Wall clouds often are trailing sides of a storm. For example, with a storm that is moving north or northeast, the wall cloud typically is on the south or southwest side of the storm. With some storms, the wall cloud area may be marked by precipitation. Wall clouds associated with potentially severe storms:

- Usually persist for 10 minutes or more
- Often, but not always, rotate visibly
- Sometimes are accompanied by obvious rising or sinking motion of cloud piece

Flanking Line: A flanking line is a row of towering cumulus clouds stair-stepping up to the main storm tower. New storm cells can develop from the flanking line, which usually extends south or southwest of a thunderstorm.
Modernization efforts have been in progress since 2008.
Spotter Training, Tracking and Reporting System

STTARS

Core Features

Standardize Training
National Registry
Reporting & Tracking
“Brings storm spotters, storm chasers, coordinators and public servants together in a seamless network of information”

Online @ SpotterNetwork.org
“Brings storm spotters, storm chasers, coordinators and public servants together in a seamless network of information”

Shows What’s Going on REAL TIME, RIGHT NOW

Online @ SpotterNetwork.org
A Quick Tour...

Welcome to the Spotter Network!

The SpotterNetwork brings storm spotters, storm chasers, coordinators and public servants together in a seamless network of information. It provides accurate position data of spotters and chasers for coordination/reporting and provides ground truth to public servants engaged in the protection of life and property.

Images for montage graciously provided by Tony Laubach or in the public domain
A Quick Tour...

### Weather Report

- **Try and submit to NWS if possible**
  - **Tornado**
  - **Funnel Cloud**
  - **Wall Cloud** *(Must Supply Narrative Below)*
  - **Hail** *(Size)*
  - **High Wind** *(Do not report less than 50MPH winds)*
    - **Wind Speed**
    - **Wind Type** *(Measured or Estimated)*
  - **Flood** *(Must Supply Narrative Below)*
  - **Flash Flood** *(Must Supply Narrative Below)*
  - **Other** *(Must Supply Narrative Below)*

**NOTICE:**
- First hand reports only. **NO** relay reports
- Do **NOT** submit estimated rain measurements. Measured **ONLY**!
- Wall cloud report? Make sure you checked rotating or not rotating above
A Quick Tour...
A Quick Tour...

Live Chase Cams

Wide spread availability of 3G Network

Not for rebroadcast without prior written permission
A Quick Tour...

Welcome to Our New Training Portal!

On this site, you will find a growing number of online courses that bring focus upon weather events that have the potential for causing disasters. These courses are were originally targeted towards first responders including fire fighters, emergency management, law enforcement, dispatchers, public works, and search and rescue personnel, but have since been recalibrated to fit the needs of the storm spotter and storm chasing community. The objective of our courses is to help demystify the 'science' of weather-vocabulary and present the participant with simplified processes by which hazardous weather events come about. These courses are offered in a visually rich manner in hopes that the participants will emerge with a practical knowledge of weather phenomena and appropriate methods to communicate severe weather reports.

Available Courses

Thunderstorms - An Introduction
A Quick Tour...

Water acts as THE carrier of heat energy in atmospheric processes. Weather really happens when water is involved, not to say that temperature differences are also important in weather formations.

Three States of Water

Water

Ice

Steam
A Quick Tour...

Flash Flood Factors

Rainfall Intensity  Rainfall Duration  Land Topography  Soil Condition  Ground Cover

Most flash floods are the result of stalled or slow moving thunderstorms, or thunderstorms that move repeatedly over the same area (also known as Training Thunderstorms). Clearly where heavy rains are a result from tropical storms and hurricanes flash floods can also result. Once again these floods can develop within minutes or over hours depending on the conditions listed below:

- Rainfall Intensity
- Rainfall Duration
- Topography
- Soil Conditions
- Ground Cover

Cities located along rivers, streams, creeks, or beneath dams are especially vulnerable if the amount of water generated during a flash flood overwhelms any protective barriers.

Training Thunderstorms are commonly associated with flash flooding events.
A Quick Tour...

Hail Damage Impact

Courtesy Denis Balbouse, Reuters

Courtesy John Cross, Mankato Free Press

Courtesy NWS-Louisville

Courtesy NWS-Green Bay
A Quick Tour...
A Quick Tour...
A Quick Tour...

Implications for Storm Spotters

- While rarely lethal, hailstones can cause considerable damage and injuries.
- Wear protective head and eye gear to avoid injuries from large hail and glass fragments.
- Hail covered roads can be unexpectedly slippery.
A Quick Tour...
"Run as an organization of like minded individuals taking input from the various communities that it serves and making the output available to any and all who are interested in severe weather"
Timely, accurate, and frequent storm reports continue to play a critical role in protecting life, property, and more!
Modern Day Spotter

It’s easier than Facebook!
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It’s easier than Facebook!

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It’s easier than Facebook!

What If Thunderstorms Were Just the Beginning?
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What If Thunderstorms Were Just the Beginning?

Labor Day Weekend 2011

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Dust Storm on Radar

Courtesy of Texas Tech’s Associate Director/Athletics Communications for Football Scott Lacefield

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A Push to **ALL-HAZARD** Training, Reporting, & Tracking

**Training Opportunities**

**Network of Multi-Hazard Spotter Information**

**Technology Infusion**
Thank You.