The Future of Severe Weather Information Collection:

Fundamental Shifts In The Way We Communicate

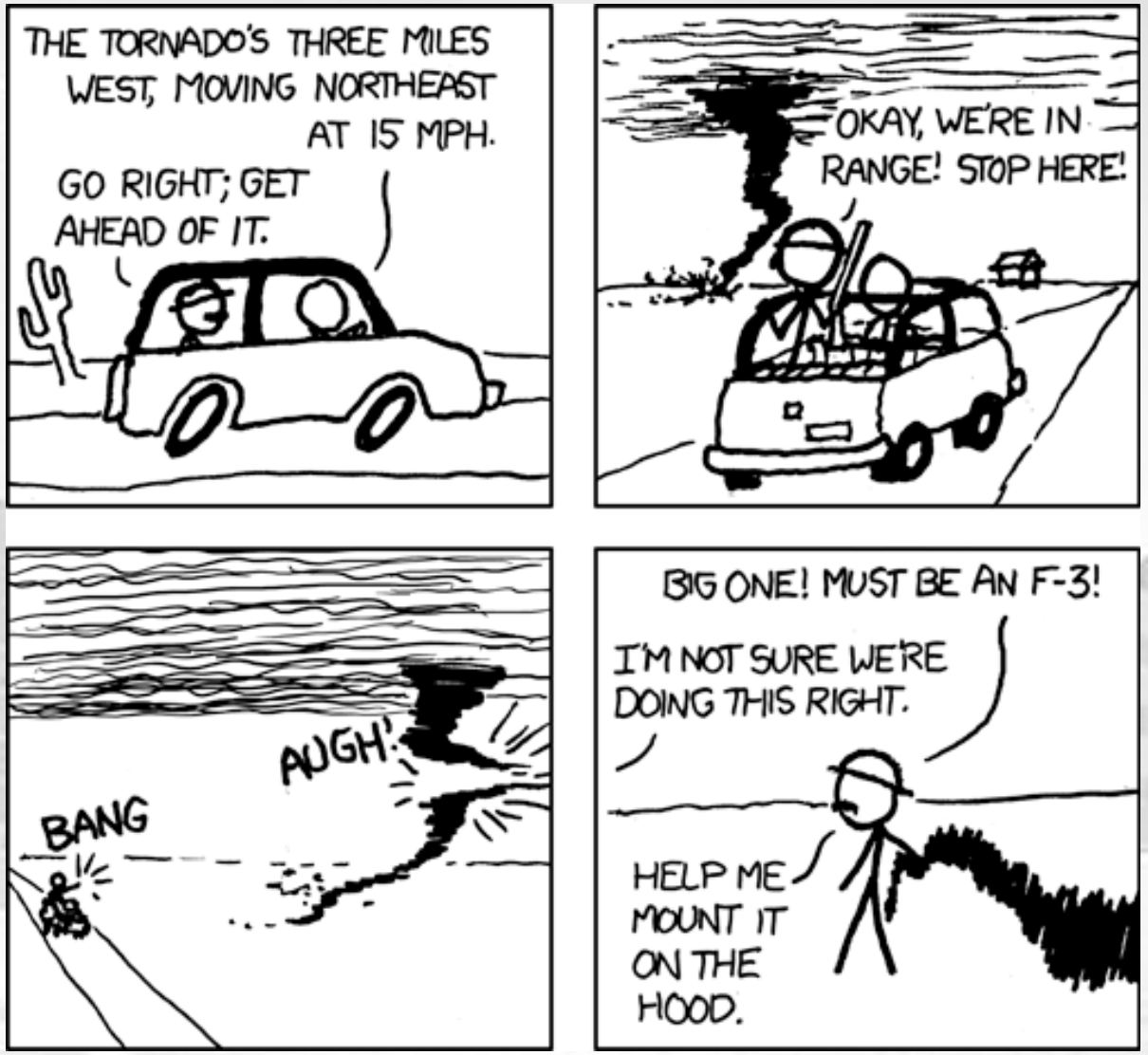
Patrick T. Marsh

National Severe Storms Laboratory

Cooperative Institute for Mesoscale Meteorological Studies

School of Meteorology

What it is not…



The Beginnings of Severe Weather Information Collection:



The Beginnings of Severe Weather Information Collection:

Step 1: Find the Storm

Find the Storm

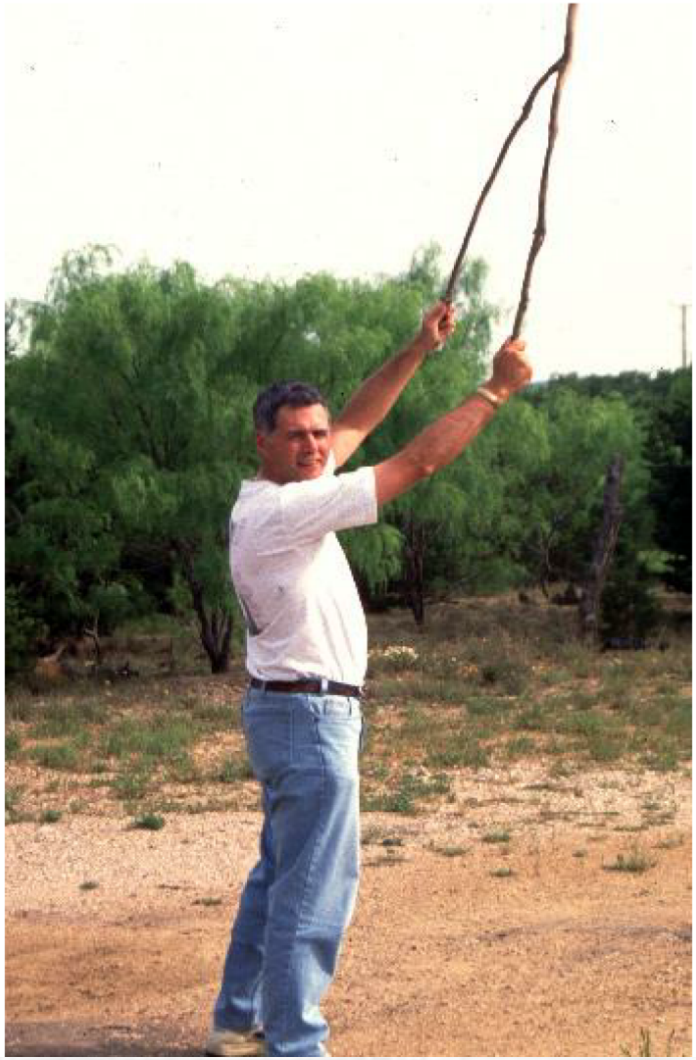


Image courtesy
of Tim Marshall

The Real Beginnings of Severe Weather Information Collection:

- Sergeant J.P. Finley published results of a tornado study in *American Meteorological Journal* in July 1884
- Resulted in a flurry of "formal" discussion in the scientific literature about forecasting rare events
- Shortly thereafter the word "tornado" was banned from official forecasts until 1938

John Park Finley



Born	April 11, 1854 Ann Arbor, Michigan, USA
Died	November 24, 1943 Battle Creek, Michigan, USA
Institutions	United States Army
Known for	Tornado research

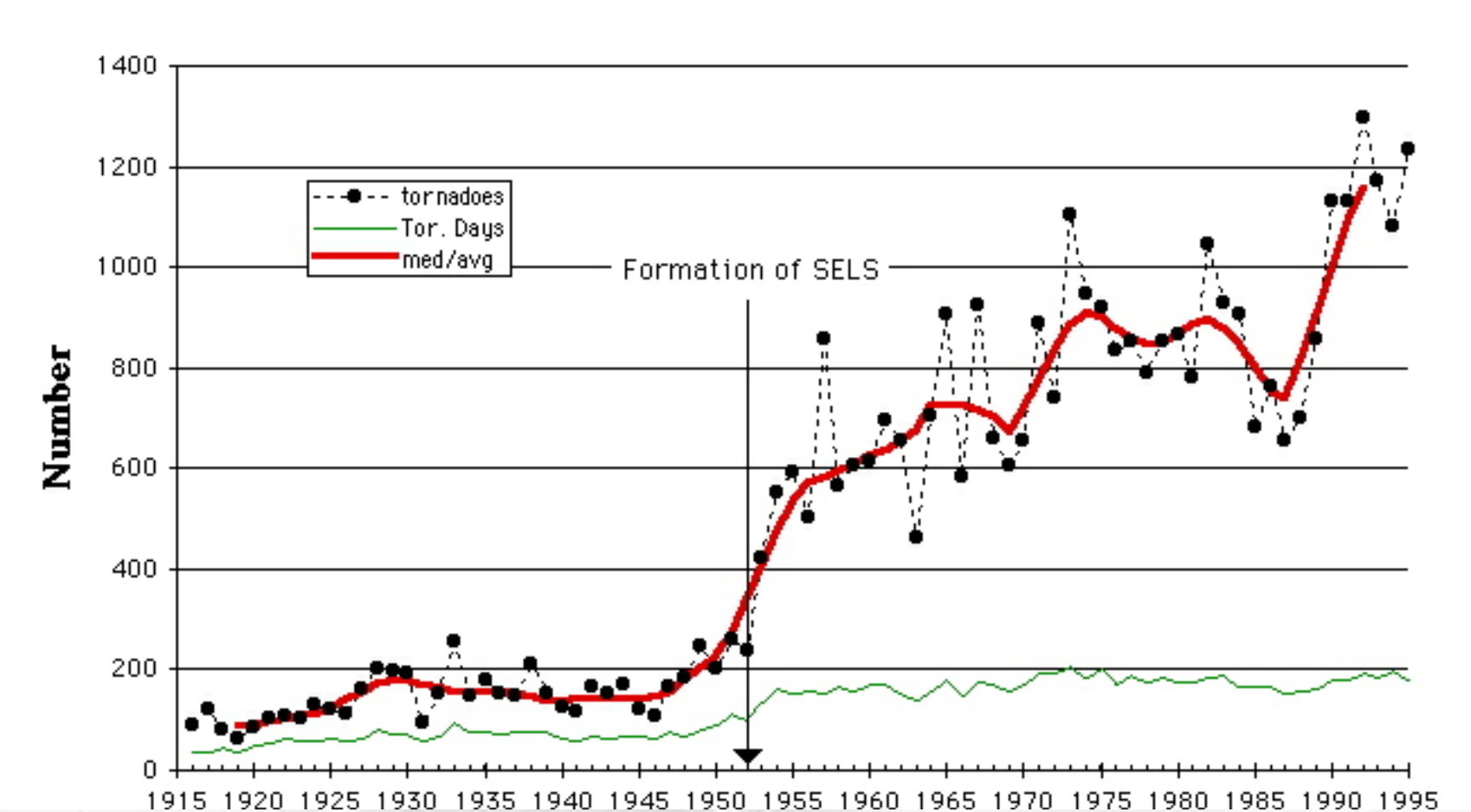
WWII: The Origin of SKYWARN

- Evolved around military installations
  - Primary concern was lightning near ordinance plants
  - Eventually Expanded to include other hazards including tornadoes
    - 27 April 1942 (Pryor, OK)
    - 15 May 1943 (Fort Riley, KS)

WWII: The Origin of SKYWARN

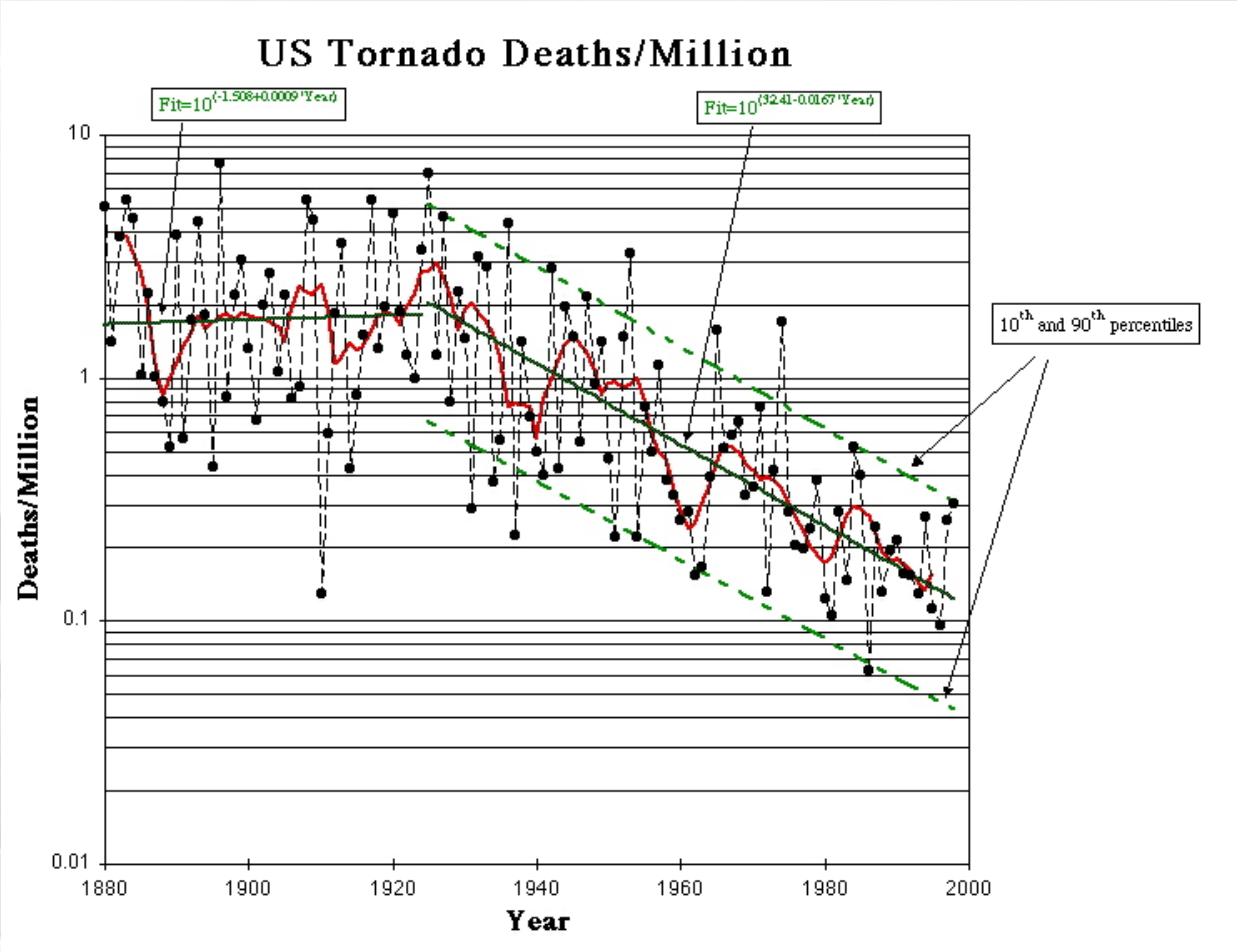
- Evolved around military installations
  - Primary concern was lightning near ordinance plants
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    - 27 April 1942 (Pryor, OK)
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- (Amateur) Radio primary means of communication

1950s – 1990s
Number of Tornadoes Observed



Originally published by Doswell et al., 1999

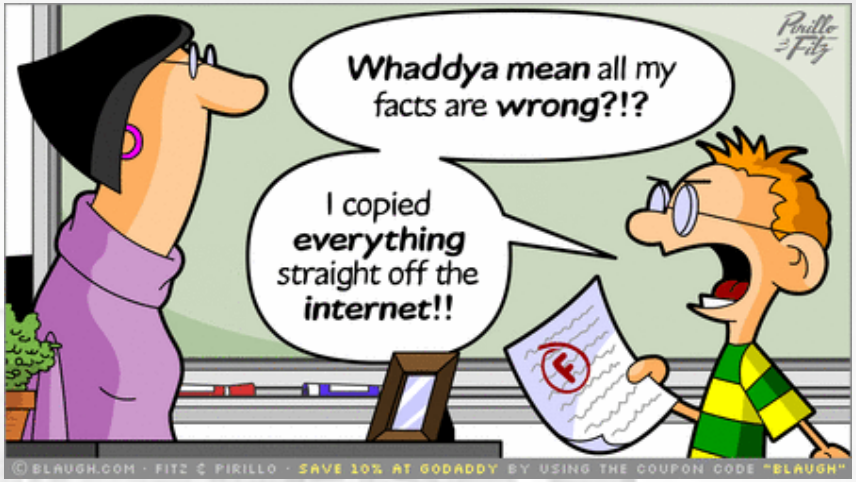
1950s – 1990s
Tornado Deaths per Million People



Originally published by Doswell et al., 1999

And Then Came The Information Revolution





Information Revolution

- Thanks to the printing press in 1700 the amount of printed information was equivalent to 60 stacks of books as high as Mt. Everest

- Thanks to the telegraph and radio by 1950 there was 6000 times more information

- Then came the computer and the Internet…

Data Deluge

- 1 letter = 1 byte



Data Deluge

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- 1 page = 1024 bytes = 1 kilobyte



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- In 2009 the entire Internet summed to 500 Exabytes
- In 2010 that more than doubled to over 1 Zetabyte (21 zeros)

Data Deluge

If we turned the Internet into print, it would make 90 stacks of books stretching from the Earth to the Sun.

And Severe Weather Information Became Available to Everyone

Severe Weather Database Files (1950-2009)

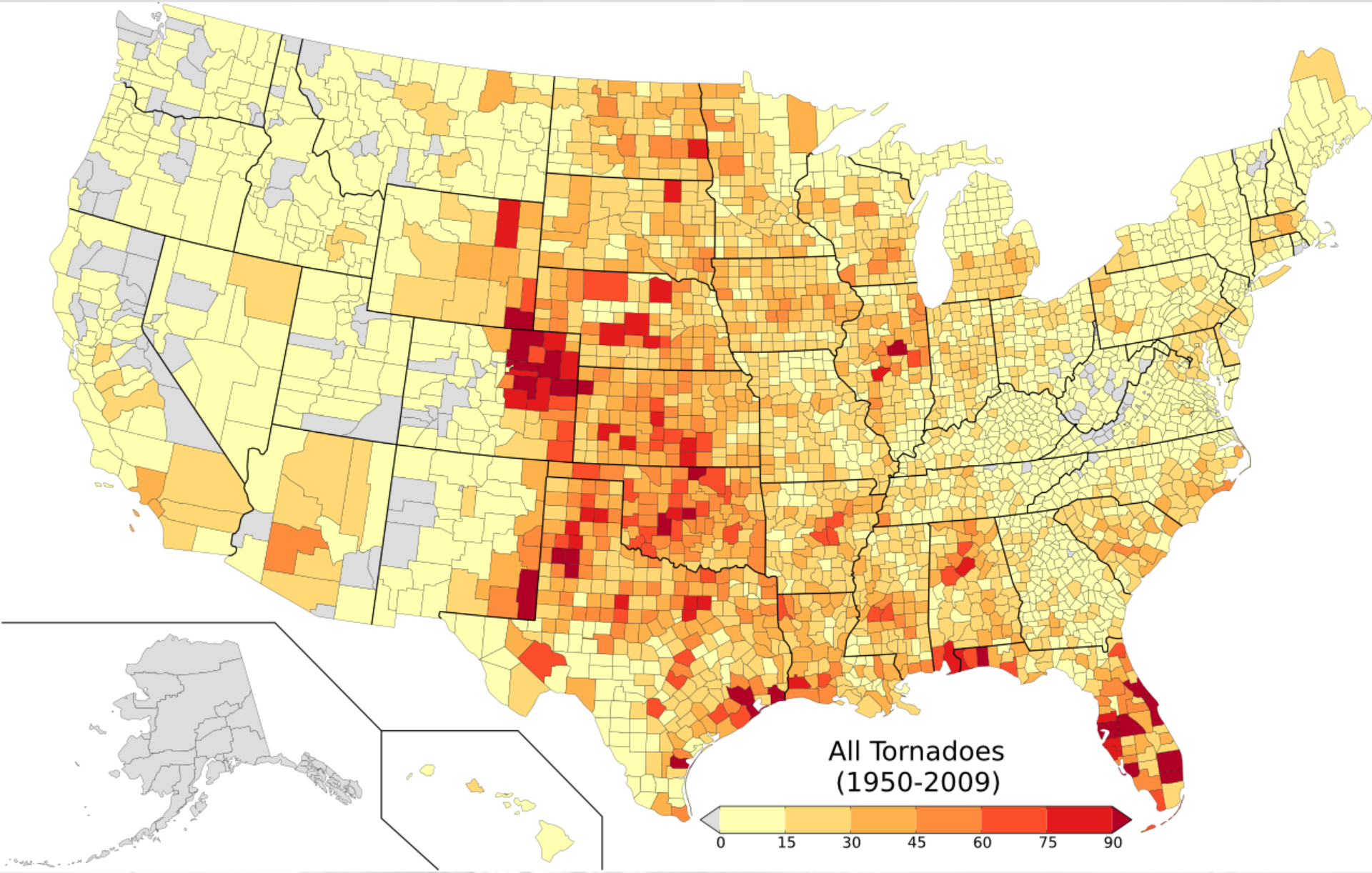
The table below provides links to comma separated value (.csv) files for tornado, hail, and damaging wind data as compiled in *Storm Data*. Tornado reports exist back to 1950 while hail and damaging wind reports date from 1955. The full datasets are very large, especially hail and wind. To facilitate quicker downloads these data have been parsed by decade (or 1/2 decade in the case of wind/hail data in the 1950s and 2000s).

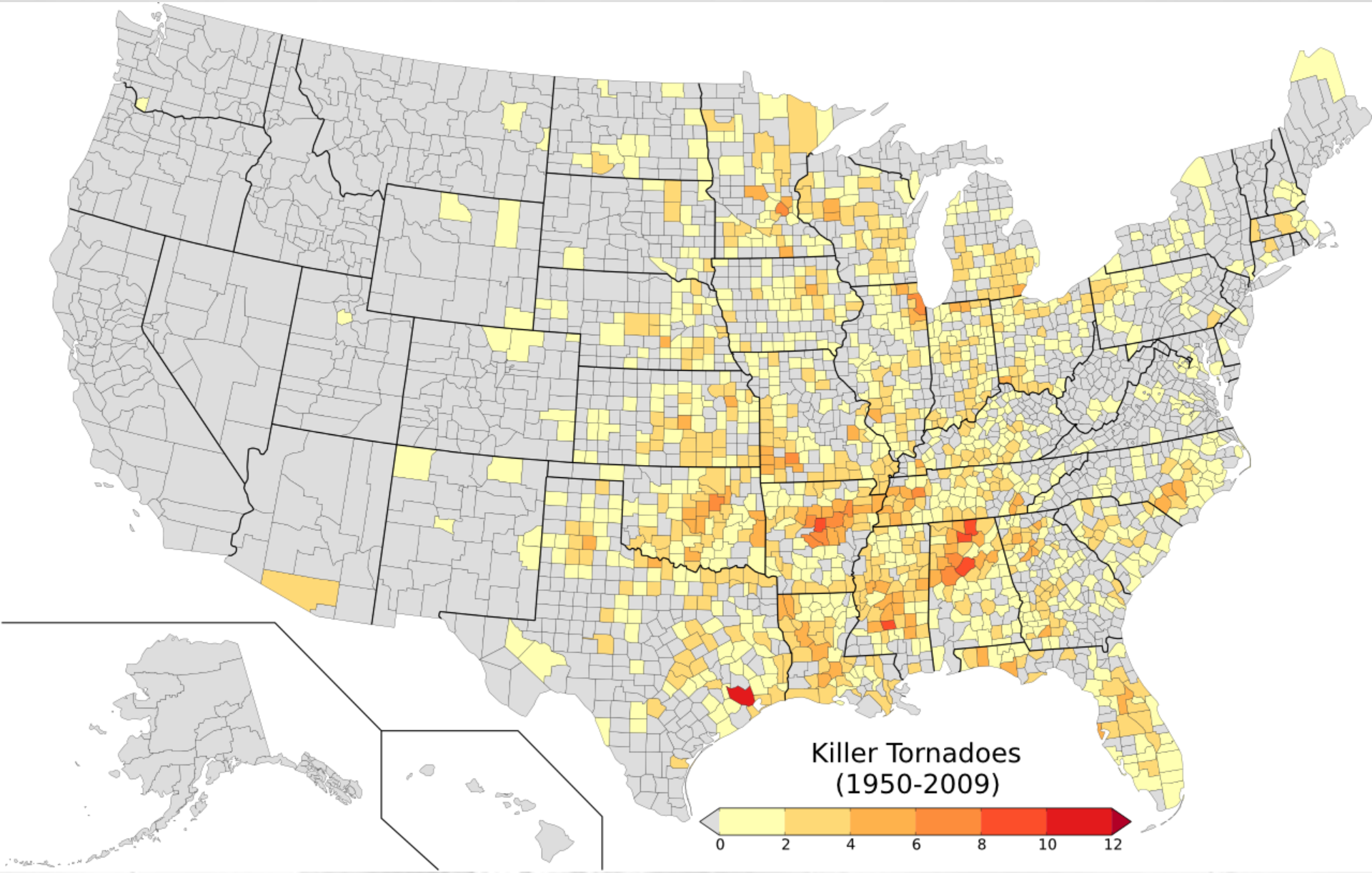
This document describes the format of the .csv files. **Note!** Data for 2009 available in the format specified in the document. However, this data should be considered preliminary.

Recent updates to some of the tornado csv files (April 7, 2010)!

TORNADO	HAIL	DAMAGING WIND
2009_torn.csv (0.14 mb)	2009_hail.csv (1.4 mb)	2009_wind.csv (1.5 mb)
2008_torn.csv (0.18 mb)	2008_hail.csv (1.7 mb)	2008_wind.csv (1.7 mb)
2005-2007_torn.csv (0.25 mb)	2005-2007_hail.csv (4 mb)	2005-2007_wind.csv (4 mb)
2000-2004_torn.csv (0.7 mb)	2000-2004_hail.csv (6 mb)	2000-2004_wind.csv (6 mb)
90-99_torn.csv (1 mb)	90-99_hail.csv (6 mb)	90-99_wind.csv (8 mb)
80-89_torn.csv (0.75 mb)	80-89_hail.csv (2.5 mb)	80-89_wind.csv (3.5 mb)
70-79_torn.csv (0.82 mb)	70-79_hail.csv (1 mb)	70-79_wind.csv (1.6 mb)
60-69_torn.csv (0.65 mb)	60-69_hail.csv (0.67 mb)	60-69_wind.csv (0.90 mb)
50-59_torn.csv (0.46 mb)	55-59_hail.csv (0.20 mb)	55-59_wind.csv (0.28 mb)

Location Codes for Storm data here.
Map of State FIPS Numbers here.
Text list of County FIPS Numbers here.


All Tornadoes
(1950-2009)
0
15
30
45
60
75
90


Killer Tornadoes
(1950-2009)
0
2
4
6
8
10
12

Before We Go Any Farther

A Little About Me

How Most People Know Me (Then)





Patrick Marsh Wildlife Area



How Most People Know Me (now)

TODAY
Wednesday, June 30, 2010
H: 87° L: 67°, Mostly clear

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OU meteorology student looks for snow — in all 50 states

BY MATT DINGER 0
Published: February 13, 2010
Modified: February 16, 2010 at 3:19 pm

NORMAN — A meteorology graduate student at the University of Oklahoma is collecting photos from across the nation in an attempt to get a photographic record of snowfall in all 50 states on the same day.

SHARE THIS ON FACEBOOK
Recommend Be the first of your friends to recommend this.

WHAT'S INSIDE
An NFL Payday
Former OU QB Sam Bradford is prepping for the NFL and financial security.

TOP VIEWED STORIES view all
Narcotics agents arrest suspected cartel 18,544



Snow in all 50 states? Snow's no surprise for Oregon, however

Published: Friday, February 12, 2010, 1:55 PM

Sanne Stienstra, Special to OregonLive.c...
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Story tools

University of Oklahoma meteorological student **Patrick Marsh** is on an unusual quest -- to collect photos of the snow on the ground in all 50 states in America. Hawaii has had snow on some of its mountaintops and today, Florida's panhandle successfully completed the 50-state snow tour when it saw wet snow falling from the sky.

Currently, Marsh already has images of snow from 27 states and Washington, D.C. "We're doing quite well for it being so early in the day," **Marsh told NPR's Melissa Block** earlier today.

When he finishes collecting all the pictures, Marsh plans to compile an image of the snow-covered country on **Google Earth** that will be



www.news9.com

Patrick Marsh is attempting to make a snow collage of America.

How Most People Know Me (now)

npr

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A Quest To Photograph Snow In All 50 States

Listen to the Story
All Things Considered

February 12, 2010

With a small amount of snow that fell in the Western panhandle c
snow on the ground in all 50 states. Meteorology student Patrick
every state.

The Christian Science Monitor

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Snow in all 50 states? New storm could make that true.

The South faces the brunt of another major East Coast snowstorm. If the Florida Panhandle gets an inch or two as expected, then there will be snow in all 50 states.

So How Did This Happen?

Snowshot of America

If snow sticks to the ground in Florida tomorrow (Pensacola?), every state (including Hawaii) will have snow on the ground.

12:39 PM Feb 11th via Chromed Bird



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Tomorrow between Noon & Midnight take a pic of your snow on the ground and email it to snow@forwarn.org. Hoping for pics from all 50 states.

1:56 PM Feb 11th via Chromed Bird

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If Facebook is your medium of choice, Snow Photo Event found here: http://bit.ly/9SxqqT. Please help me spread the word.

Thu Feb 11 2010 14:13:48 (Central Standard Time) via Chromed Bird

And We're Off…

- OKC AP Bureau Chief
- News 9 OK
- The Weather Channel
- Drudge Report
- Baltimore Talk Radio
- NPR – Talk of the Nation
- Daily Oklahoman
- OU Daily
- Pensacola Newspaper
- Pensacola Talk Radio
- ABC Evening News
- CBS Evening News
- NBC Evening News
- ABC Good Morning America
- …and many more…

What I Received

- Over 1000 emails
  - Around 100 emails questioning my knowledge of Geography & Meteorology
    - Including 1 from a University Professor (not OU)
- Around 1500 photographs
  - Many people sent multiple photographs
  - Made new acquaintances across the country

Key Points

- Social Media isn’t a fad; it’s a fundamental shift in how we communicate



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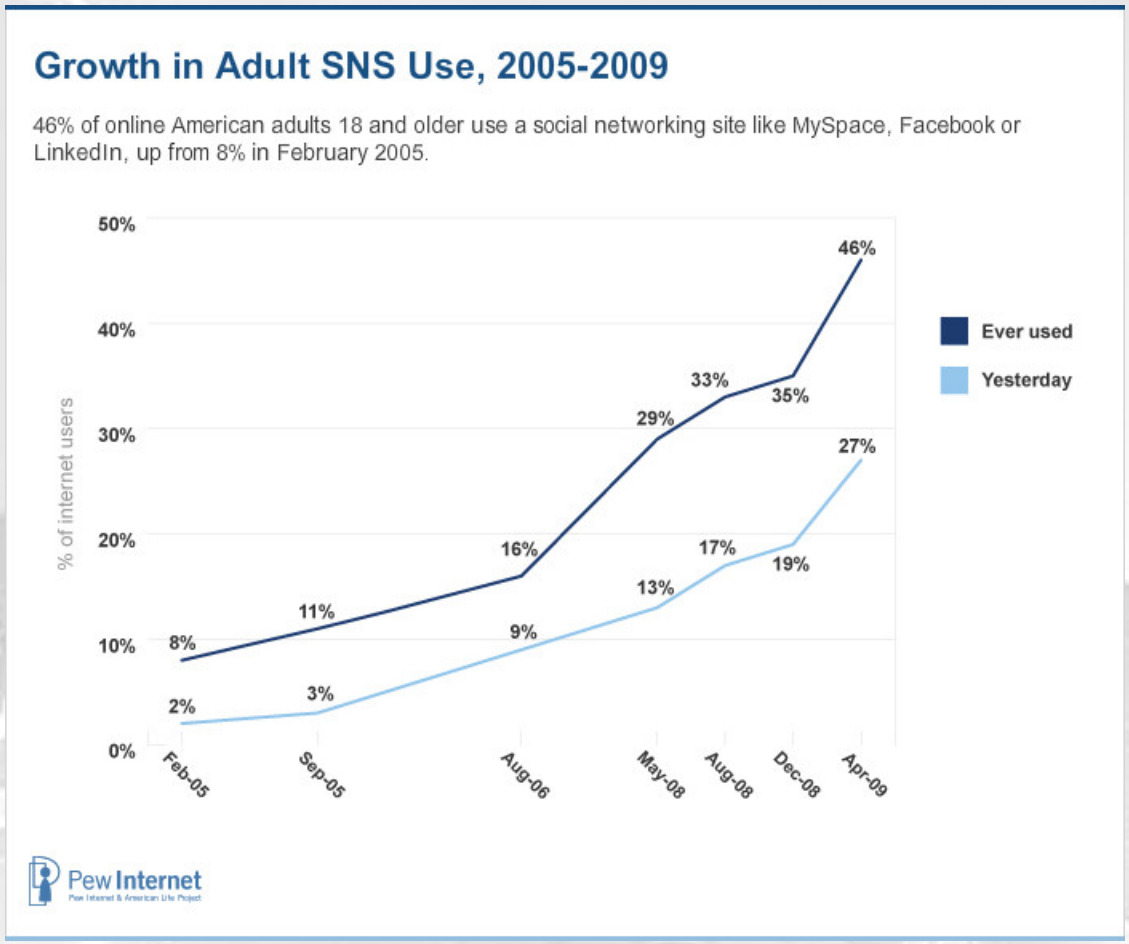
- We no longer search for news…

Key Points

- Social Media isn't a fad; it's a fundamental shift in how we communicate

- We no longer search for news…the news finds us…

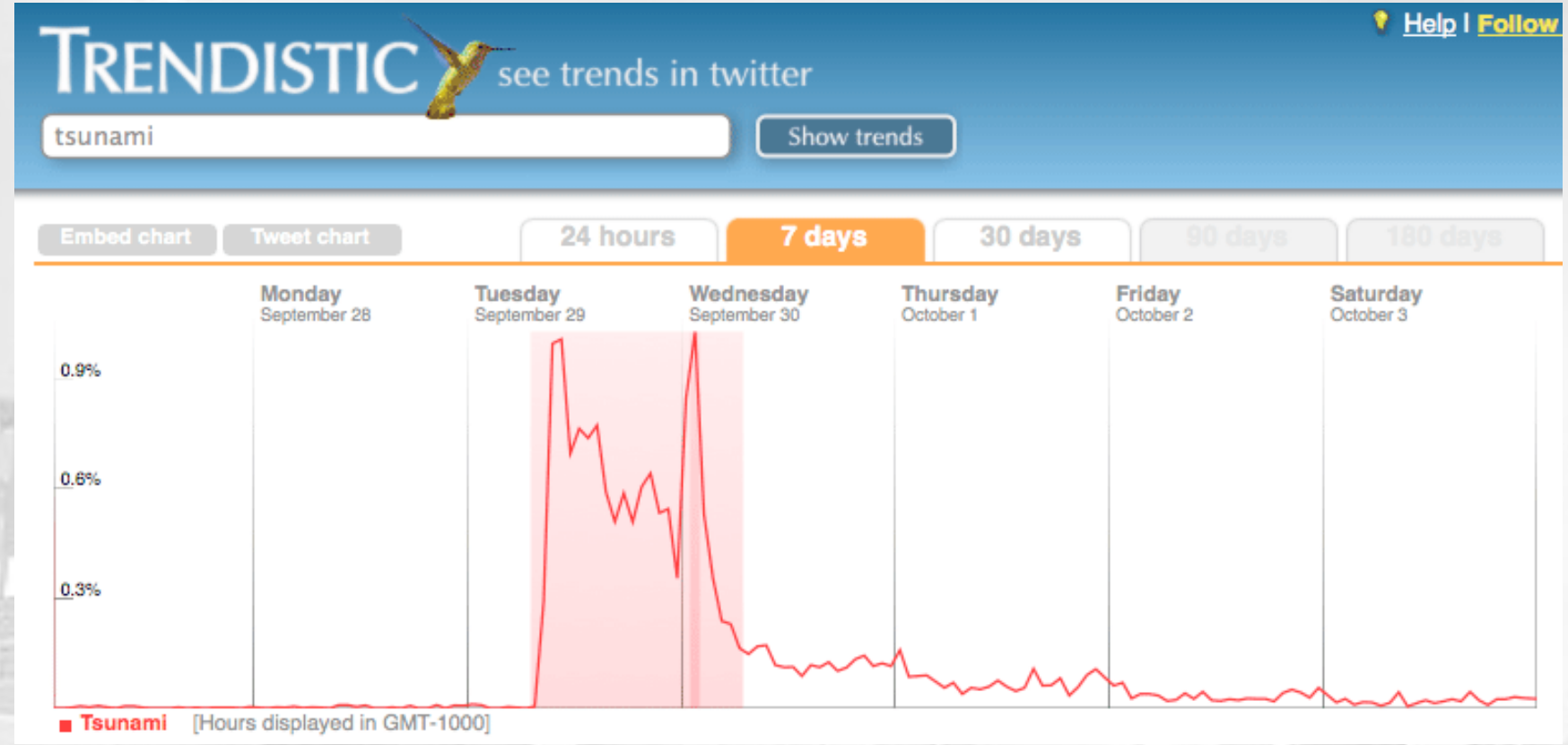
Pew Stats on Social Networking Site (SNS) Use: It's not just "Kids"



- 79% of American Adults used the internet in 2009.
- 59% adults primarily receive news via the internet (75% from SNS).
- 46% adults use SNS
- 37% of internet users contribute to creating or disseminating news.
- 79% of SNS users on Facebook (median age 33), 19% on Twitter (median age 31)

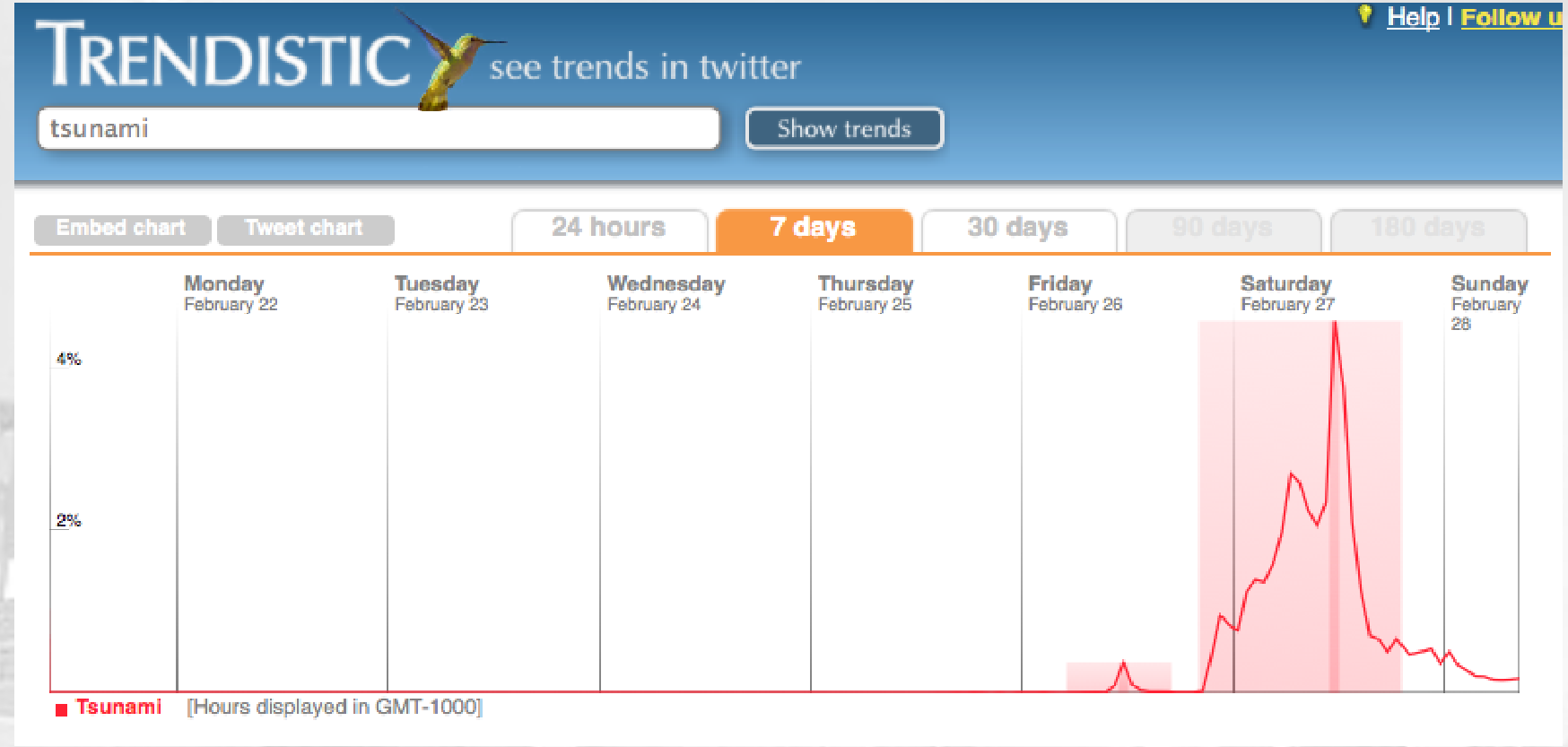
http://www.pewinternet.org/topics/social-networking.aspx
http://www.pewinternet.org/Reports/2010/Online-News.aspx

Twitter During Samoa Tsunami 29 Sep 2009



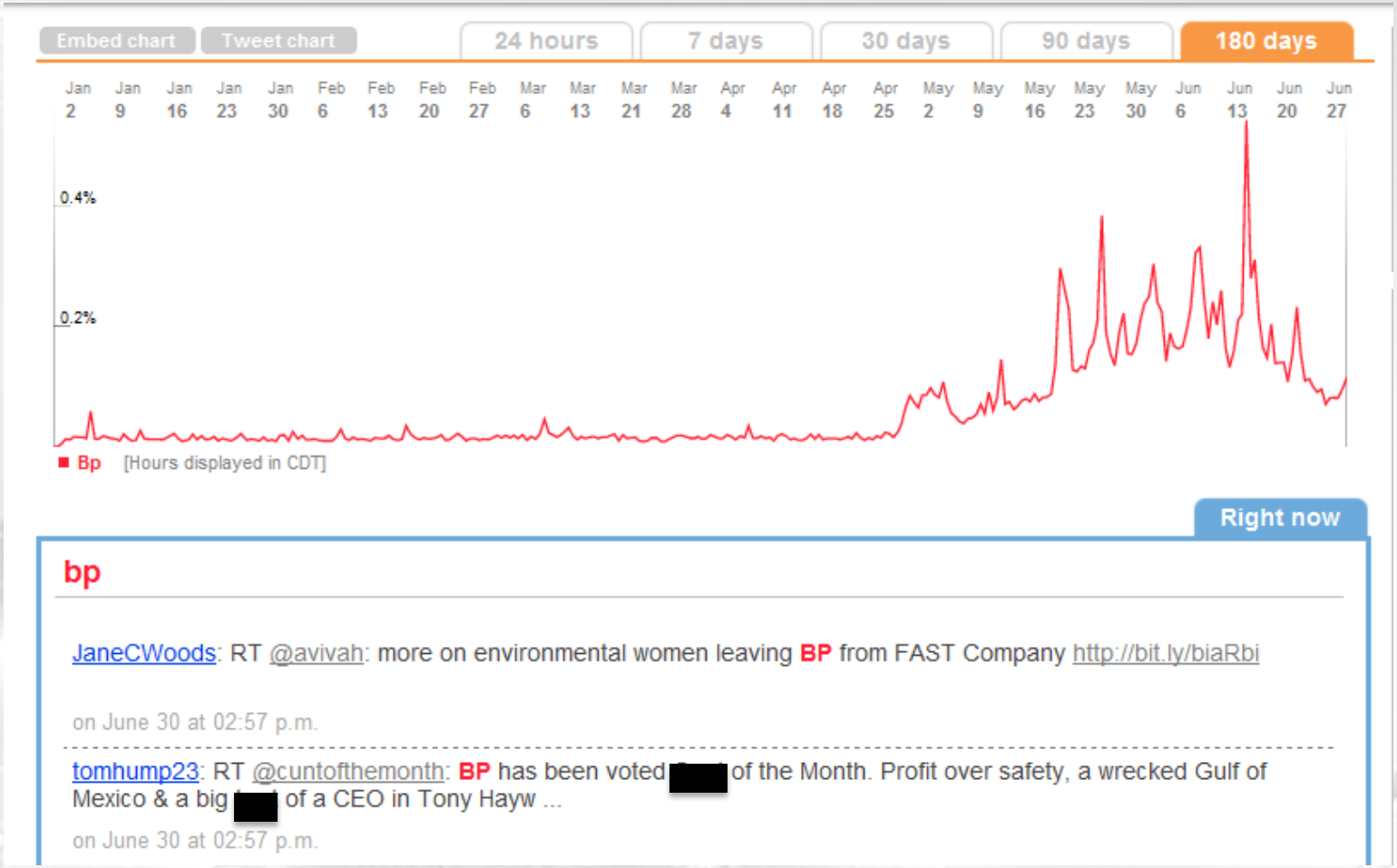
- "tsunami" was #2 keyword during the peak with about 14,000 tweets.

Twitter During Chile Tsunami 27 Feb 2010

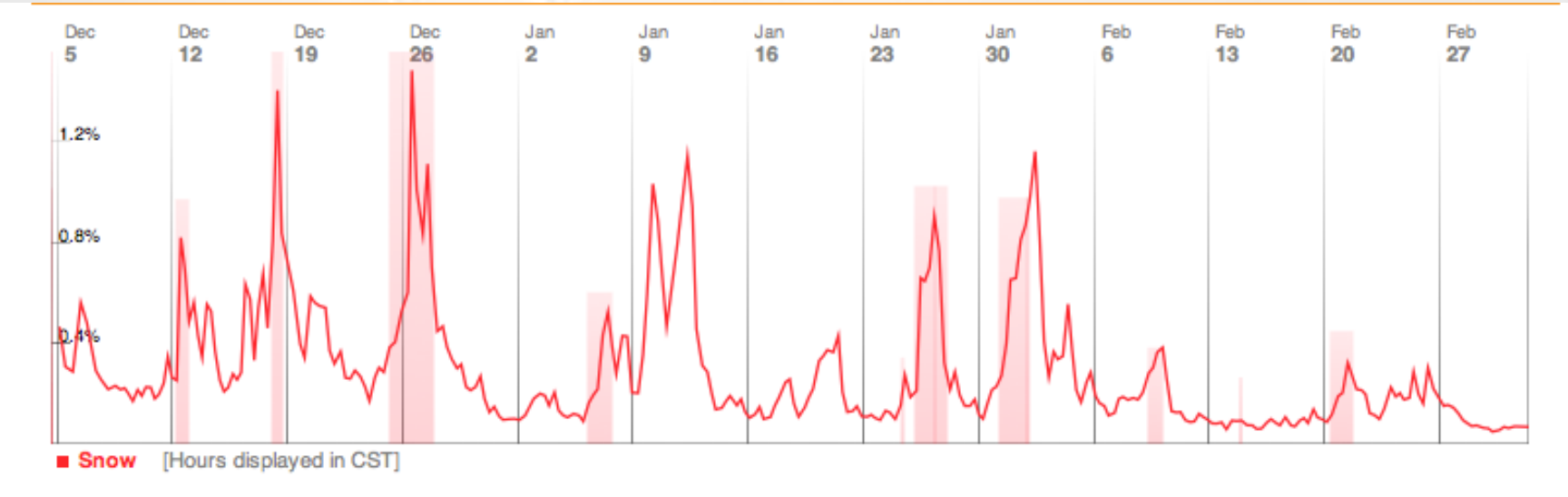


- "tsunami" was a top keyword during the peak with about 62,000 tweets.

Twitter During the Gulf Oil Spill
“BP”

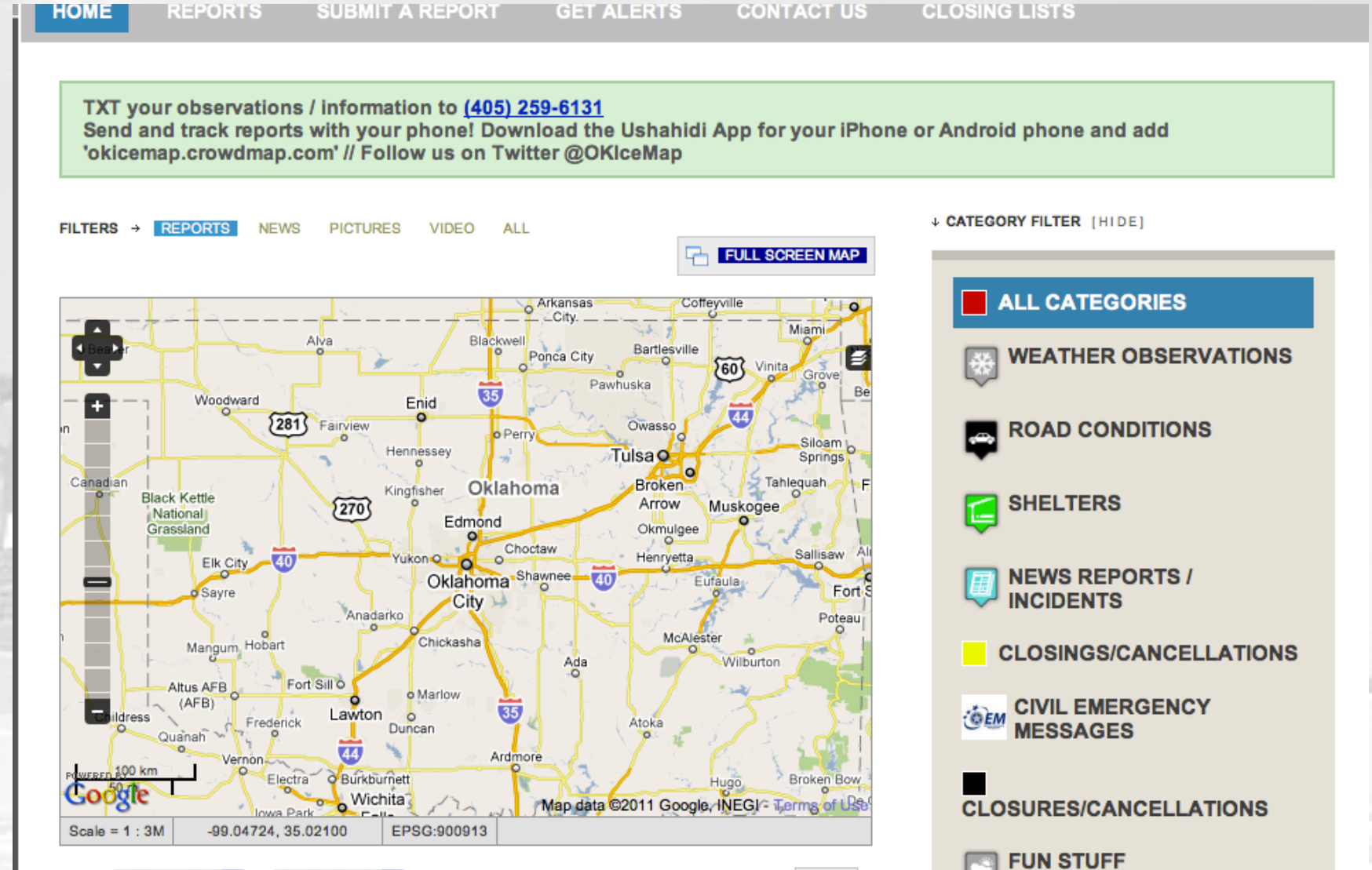


Twitter During Last 30 Days
“Snow”

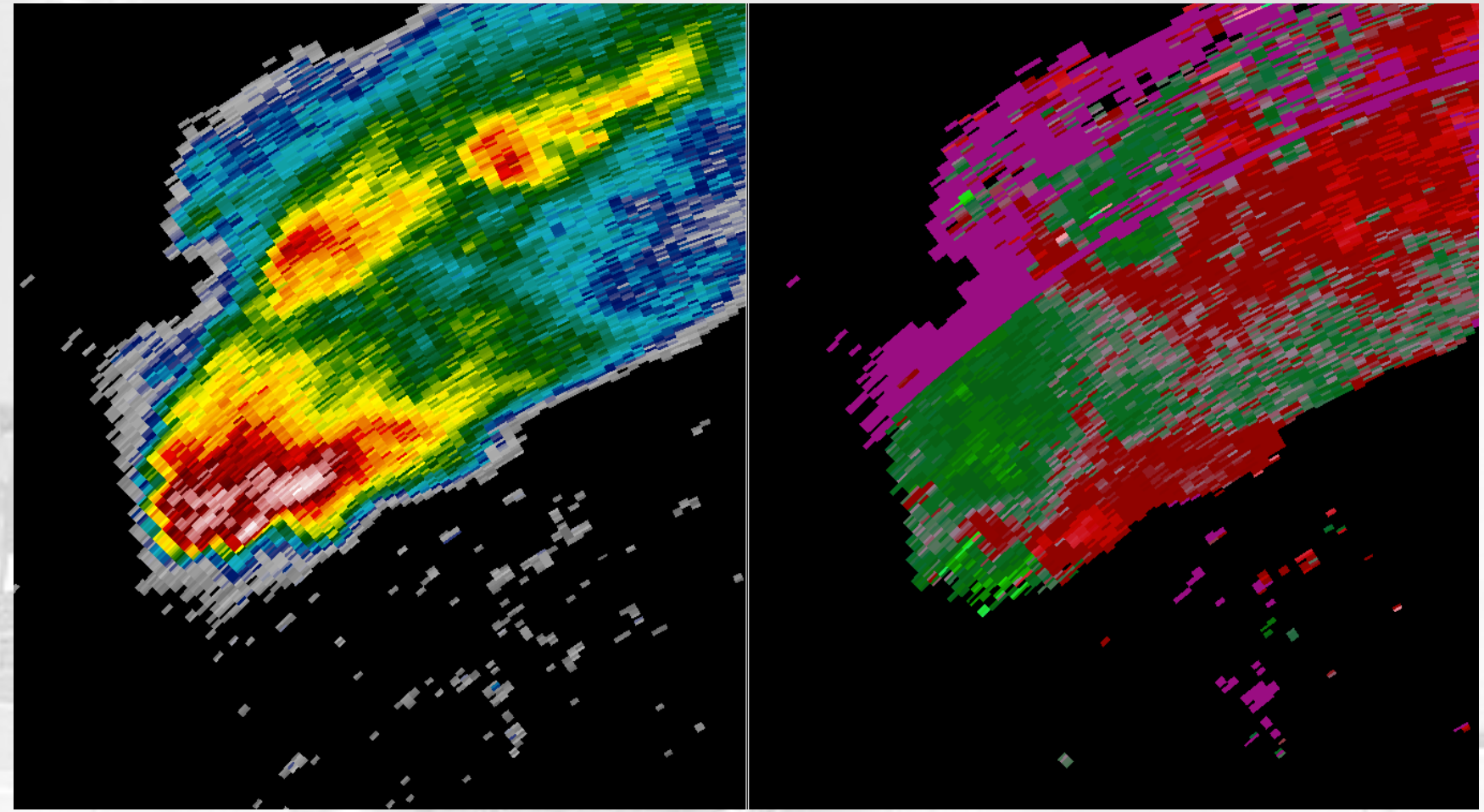



CAN WE USE THIS TO COLLECT
SEVERE WEATHER INFORMATION?

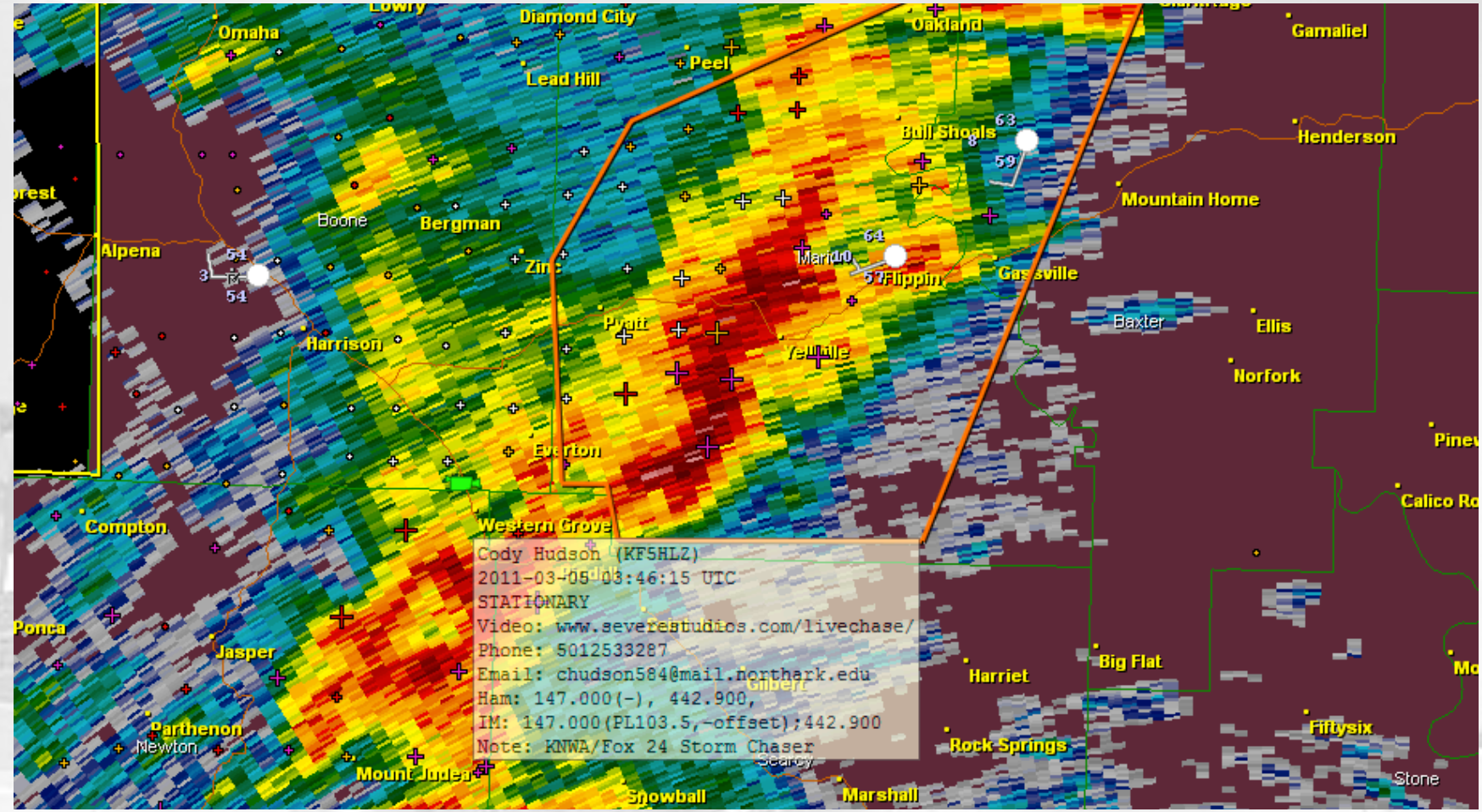
YES! Geolocating Tweets - OK Ice Map



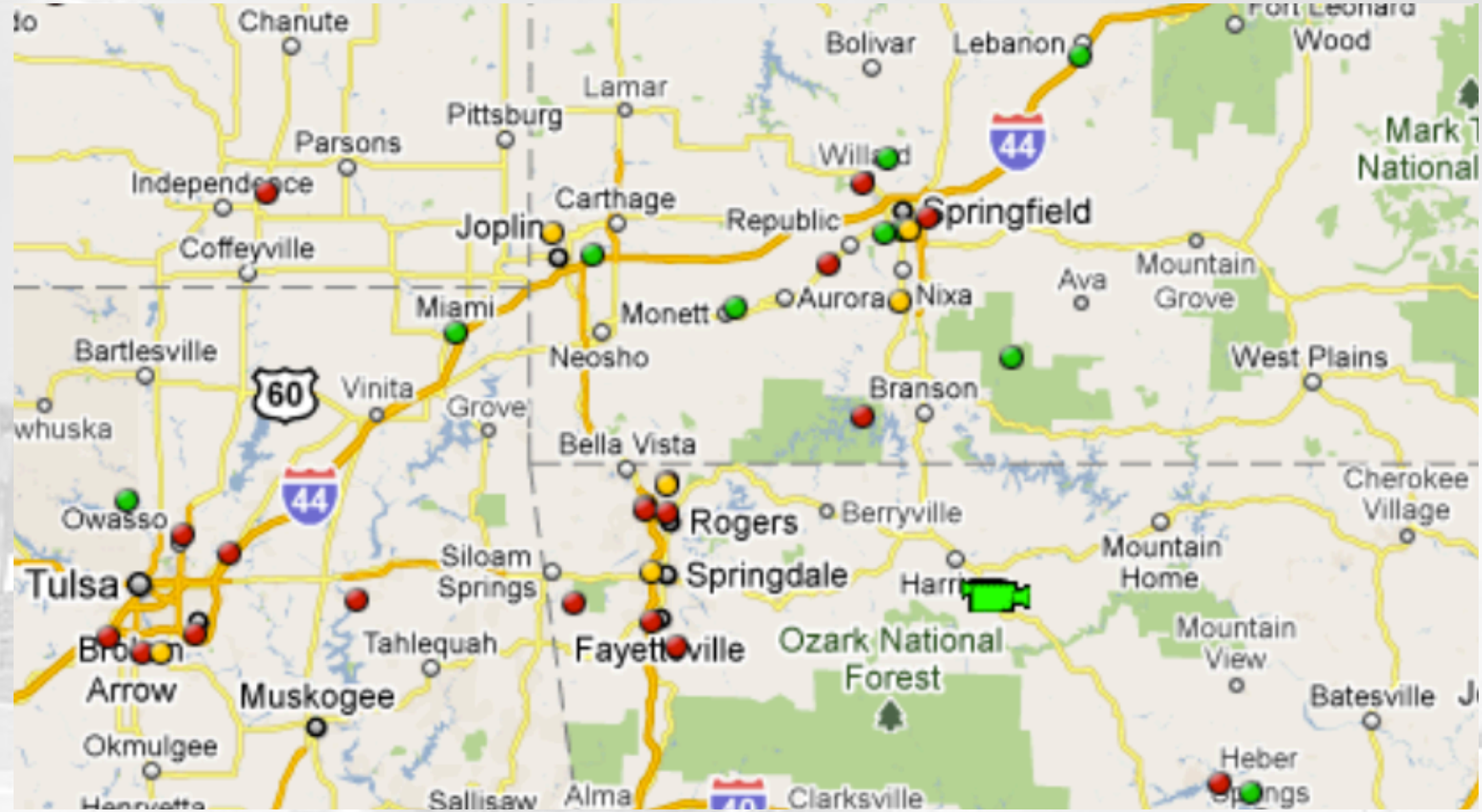
Useful in Severe Thunderstorms?



SpotterNetwork.org



SpotterNetwork.org



Only have a Smartphone?

- Take picture and upload to Twitpic (or one of the many similar FREE sites)
- Take video and upload to Twitvid (or one of the many similar FREE sites)
- Do a short “stream” from your location using Ustream or one of the similar FREE sites

When Using Twitter

- Help Ensure Your Report Is Heard!
  - Use consistent “hash-tags”
  - #OKwx, is a good place to start
- If geotagging is available:
  - “#wxreport <report goes here>
- If no geotagging:
  - #wxreport WW city, st WW <report goes here>

Social Media Pro's, Con's, and Opportunities

- Strengths
  ENGAGEMENT!, rapid, wide-reaching, emergent, creative, synergistic, engaging, vibrant, collaboration, open, easy to implement, free!
- Weaknesses
  constant change, unknown quality, less mature, requires motivation, cannot be forced, free expression poses risks
- Opportunities
  attract new audiences, build trust, put human face on government, leverage internal/external capacities, provide creative solutions, monitor & shape emerging trends

Any questions?

Patrick Marsh
http://www.patricktmarsh.com
http://www.youtube.com/user/pmarshwx
@pmarshwx; @NOAAHWT
patrick.marsh@noaa.gov



Special Thanks

- Connor McCrory
  - http://www.texasstormchasers.com/
  - Live Stream with ChaserTV
- Brandon Sullivan
  - http://wickedwindmedia.com/
  - Live Chase Stream with ChaserTV

Take Away Point

- Video >> Picture

Take Away Point

- Video >> Picture
- Picture >> Description

Take Away Point

- Video >> Picture
- Picture >> Description
- Description >>>>>> Nothing

Take Away Point

- Video >> Picture
- Picture >> Description
- Description >>>>>> Nothing
- Thanks!
  Patrick.marsh@noaa.gov
  http://www.patricktmarsh.com