



April 5, 2006 Meeting on Tornadoes

How the Public Gets and Reacts to Tornado Warnings and Forecasts

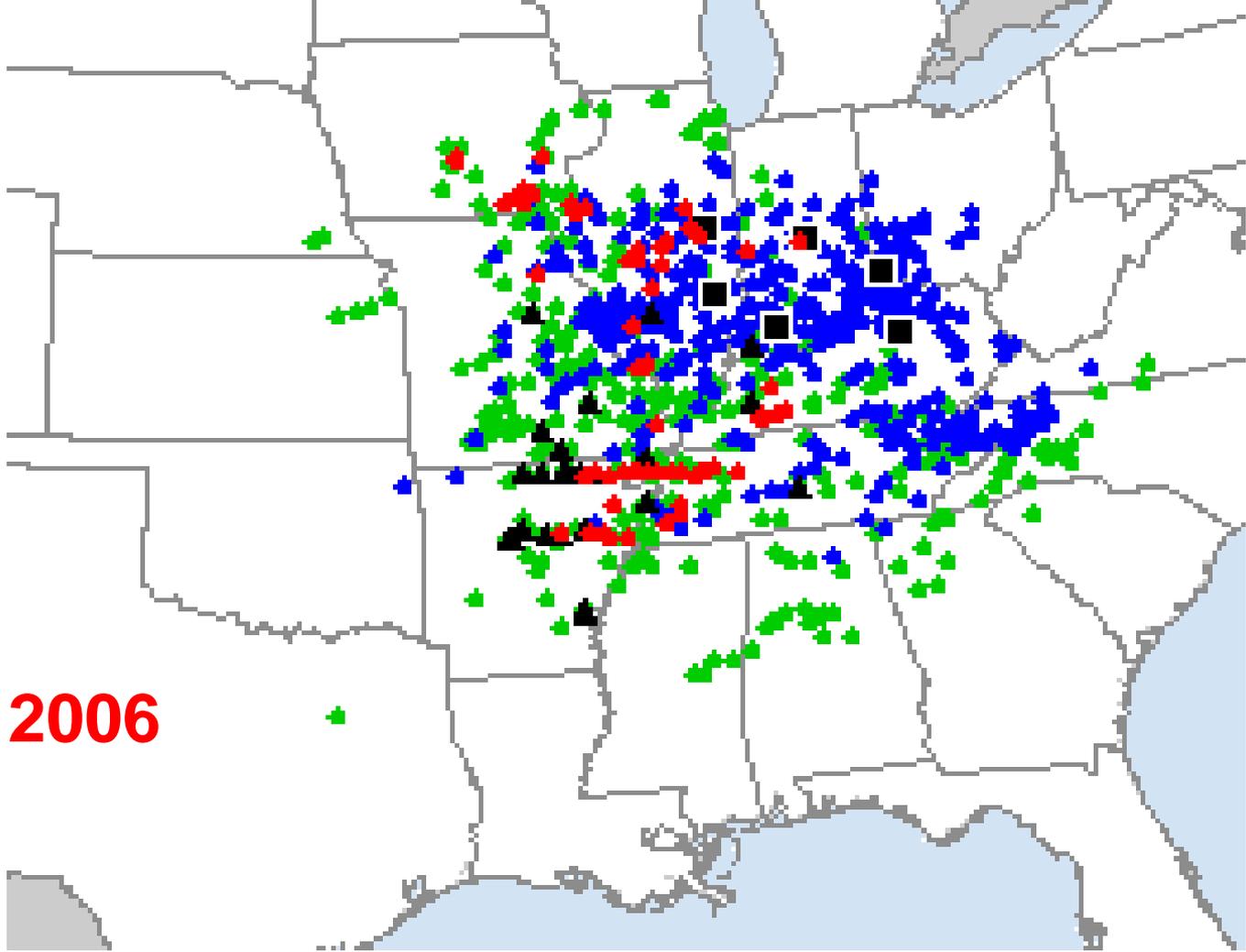
**Dr. Greg Forbes
Severe Weather Expert
The Weather Channel
Atlanta, GA**

TWC and Severe Weather

- **Owned by a privately owned communications company**
- **We partner with the National Weather Service; immediately crawl their warnings through our cable affiliates**
- **We show NWS Storm Prediction Center watches**
- **We make our own forecasts, but take NWS forecasts (outlooks) into consideration**
- **We try to emphasize life-threatening situations, to catch viewers' attention and encourage safety precautions**

DEALING WITH TORNADOES

- **We can't prevent them**
- **We try to save lives through forecasts, watches, and warnings**



April 2, 2006

 **TORNADO REPORTS.. (64)**
WIND REPORTS/HI..... (390/6)
HAIL REPORTS/LG..... (365/26)
TOTAL REPORTS..... (819)

National Weather Service
Storm Prediction Center Norman, Oklahoma

At least 28 deaths

Despite Great Forecasts and Warnings ...

Tornado Disasters Happen

Other recent examples ...

- **November 6, 2005 – F2 tornado at 2AM kills 24 near Evansville, IN (mobile home park hit)**
- **March 11-13, 2006 – 74 tornadoes; 10 deaths**

Causes of Tornado Deaths

- It's NOT due to poor forecasts
- It's NOT due to lack of NWS warnings

IT IS DUE TO:

- Homes - no match for strong and violent tornadoes
- People caught in mobile homes, vehicles
- People asleep (nighttime tornadoes)
- People unaware of danger

Deaths by Tornado Intensity 1950-2005

<u>Tornado Intensity</u>	<u>% Tornadoes</u>	<u>% Deaths</u>
Weak (F0, F1)	79	5
Strong (F2, F3)	20	32
Violent (F4, F5)	1	64

Tornado Deaths by Circumstance

Mobile Home	41%
Permanent Home	31
Vehicle	9
Business	4
School/Church	5
Outdoors	5
Others	4

In structures too weak for tornado or not in a place where it would be easy to get warning!

Solutions ?

- **Promote in-home safe rooms/shelters**
- **Promote mobile home park and community shelters**
- **Promote community warning systems**
- **Promote individual situational awareness and preparedness**

Weather Information and the Public

Today – 85 to 90% of weather information gets to the public from private commercial weather services (NRC Fair Skies Report)

In particular, the media are partners with the National Weather Service in getting out severe weather warnings

During May 1999 Oklahoma City Tornadoes ...

76% of the population got severe weather information from Radio and Television

**During May 4, 2003 Tornadoes
in KS, MO, TN ... 89% knew of warnings**

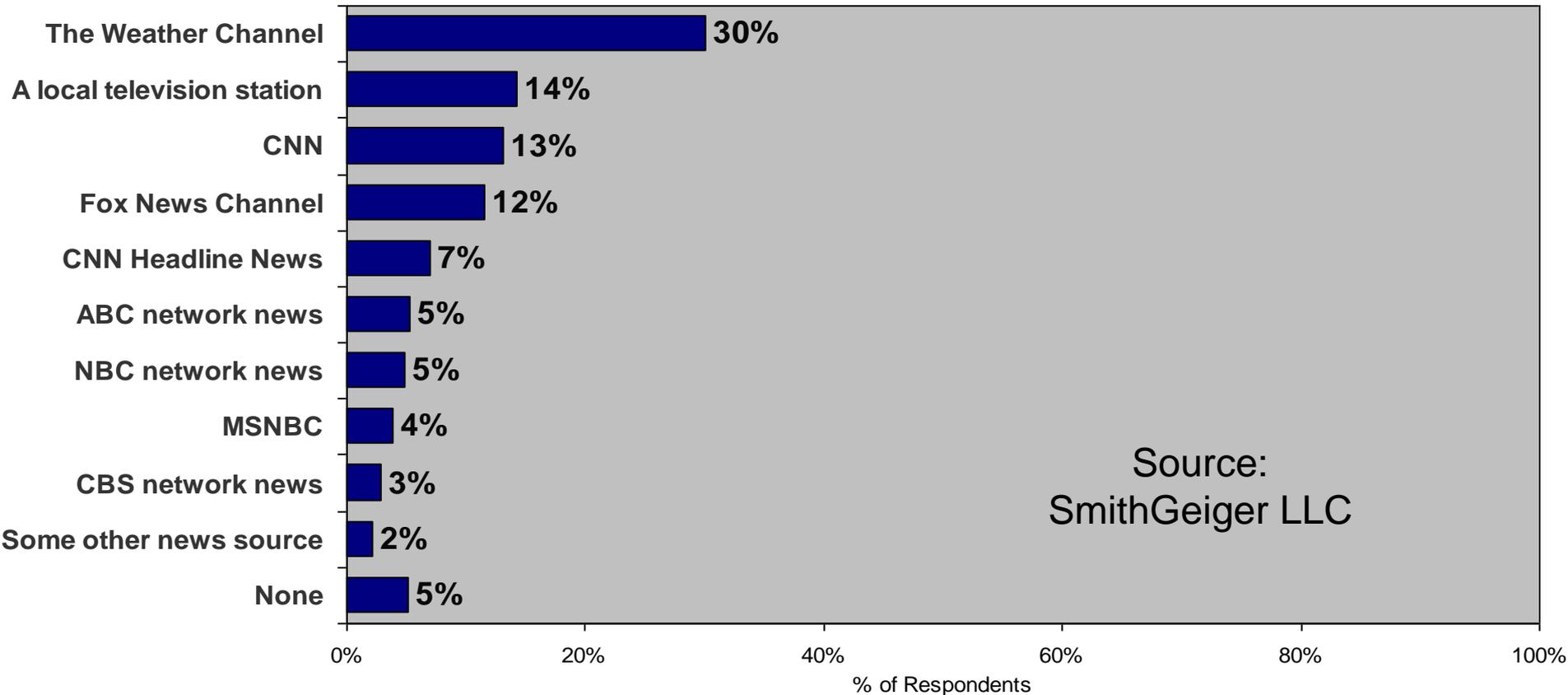
Sirens	76%
Television	70%
Commercial Radio	23%
Word of Mouth	10%
(some had more than one source)	

How the Public Gets Tornado Warnings ...

(Additional sources shown in red)

- **NOAA Weather Radio**
- **Community Sirens, Alarms**
- **Emergency Broadcast System (radio)**
- **Radio**
- **Local television (announcer or crawl)**
- **The Weather Channel (announcer or crawl)**
- **Other cable television (announcer)**
- **Instant messaging service**
 - **telephone, cell phone**
 - **paggers, other hand-held devices**
 - **computers**
- **Phone call from friends/relatives who heard by some source**

TV NEWS SOURCE EXPECTED TO WATCH MOST OFTEN DURING THE NEXT MAJOR HURRICANE OR SEVERE WEATHER EVENT (survey following Hurr. Wilma, Oct. 2005)



Hurricanes Produce Tornadoes

- 2004
 - record 338 tornadoes from hurricanes
 - Ivan (most on record), 123
 - Frances (3rd most), 107
- 2005
 - 220 tornadoes
 - Rita, 90 – largest outbreak of year
 - Katrina, 57 – 2nd largest outbreak of year

Tornadoes from Hurricanes and Tropical Storms Pose Problems

- Harder to detect
 - shallow, small circulations
- Hard to warn with long lead times
 - develop and dissipate quickly
- Hard to communicate warnings
 - move fast

**Possible solution – Improve radar technology,
additional radar resources;
as addressed in talk by Dr. Wurman**

The Tornado Warning and Communication Challenges

- Tornadoes affect tiny portions of counties
 - Hard to warn only those most in danger
- Tornadoes can develop and dissipate in minutes
 - Hard to get too long a lead time
 - Dangerous to project path too far without overwarning
- People aren't constantly monitoring the weather or the media

Even during a hurricane on TWC ...

- 5%+ of people watching instantly
- Much higher percentage tunes in once a day (peak about 50 million viewers per day)

The Solutions ?

- **Increase situational awareness a day or more ahead of time**
 - i.e., repeatedly communicate that a dangerous situation lies ahead
 - better chance that public will be alert for receiving watches and warnings
- **Increase reliance on direct alert systems**
 - Instant messaging services
 - NOAA tone-alert radio
 - GPS-based warnings

High-Technology Ways to Get Tornado Warnings

- **Pictures tell a thousand words:
Graphical displays of projected
tornado path on map**
- **Individual warnings
(from known GPS position in cars,
individual TV, etc.)**

**Topic explored by a Nov. 2000 report:
“Effective Disaster Warnings”**

**Working Group on Natural Disaster Information Systems,
Subcommittee on Natural Disaster Reduction
National Science Technical Council**