

Five Years Later

Looking Back at the Deadly 2011 Tornado Season



Five Years Later: Looking Back at the Deadly 2011 Tornado Season

SPEAKERS:

- **Laura Furgione, deputy director, NOAA's National Weather Service**
- **Russell Schneider, director, NOAA's Storm Prediction Center**
- **Jim Stefkovich, meteorologist-in-charge, NOAA's National Weather Service Birmingham (Alabama) Weather Forecast Office**
- **Vankita Brown, social scientist, NOAA's National Weather Service**
- **Harold Brooks, senior research meteorologist, NOAA's National Severe Storms Laboratory**



Laura Furgione

deputy director

NOAA's National Weather Service

Silver Spring, Maryland

2011 Extreme Weather

The U.S. Experienced Many Record-Breaking Events



*16 Billion
Dollar Events*



1000 Died



*Wildfires
Drought
Blizzards*

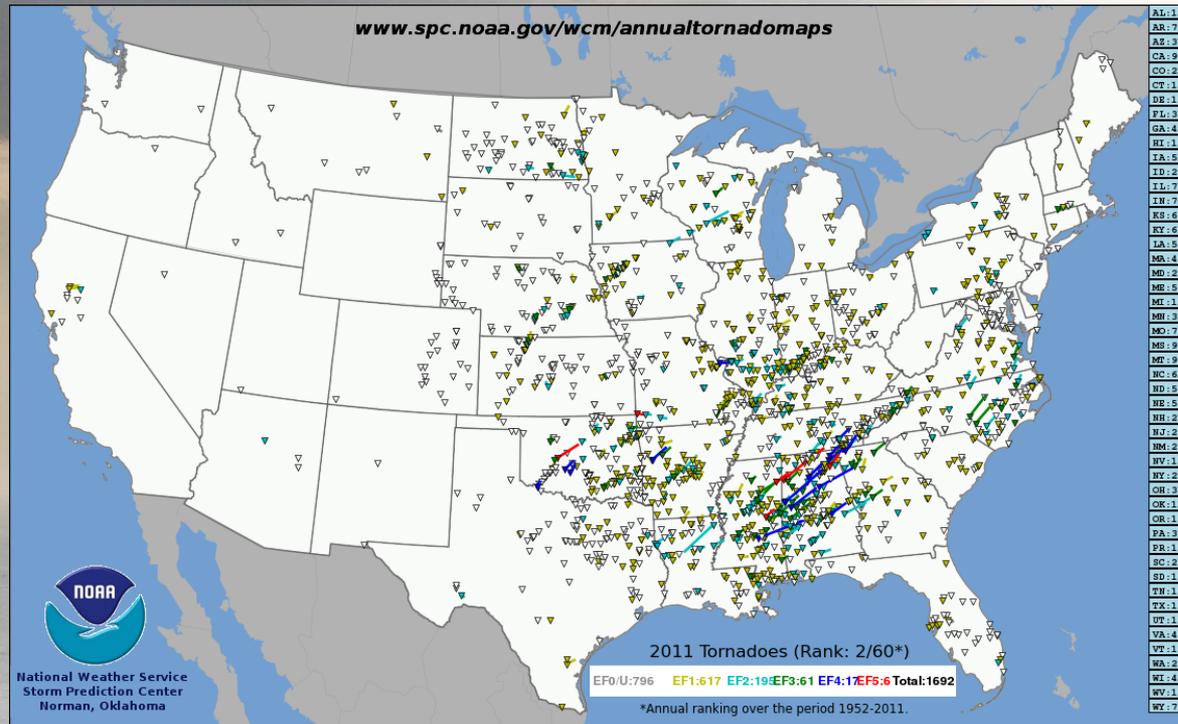


*\$67 Billion
in Losses*



*Tornadoes
Hurricanes
Flooding*

2011 Tornadoes Were Impactful



4th deadliest tornado year in U.S. history - 553 deaths



A record 757 tornadoes killed 360 people in the U.S. during April



May 22-27 outbreak of tornadoes over central and southern states caused 177 deaths

1,691 tornadoes occurred in the U.S. in 2011

Catalyst for Change



Building a Weather-Ready Nation

Becoming a Weather-Ready Nation is about building **community resiliency** in the face of increasing vulnerability to extreme weather, water and climate events

Impact-based
Decision
Support
Services



Science



Relationships



Practice



Trust

“Ready, Responsive, Resilient”

Weather-Ready Nation Ambassadors

- More than 2,600 Weather-Ready Nation Ambassadors are helping to make the nation ready, responsive and resilient to extreme weather, water & climate events.



To read their stories, visit:

http://www.nws.noaa.gov/com/weatherreadynation/success_stories.html

Wireless Emergency Alerts Saves Lives



West Ashley, SC (September 25, 2015) – Tornado struck in middle of night (12:42 am). No serious injuries.

“people in the hardest-hit neighborhoods were awakened by a Wireless Alert...alert on my iPhone...was a savior.”- Post and Courier, Johns Island residents dealing with aftermath of tornado

Cleveland, MO (September 18, 2015) – Tornado struck just before football game at Cass Midway High School. 350 people sheltered. No injuries.

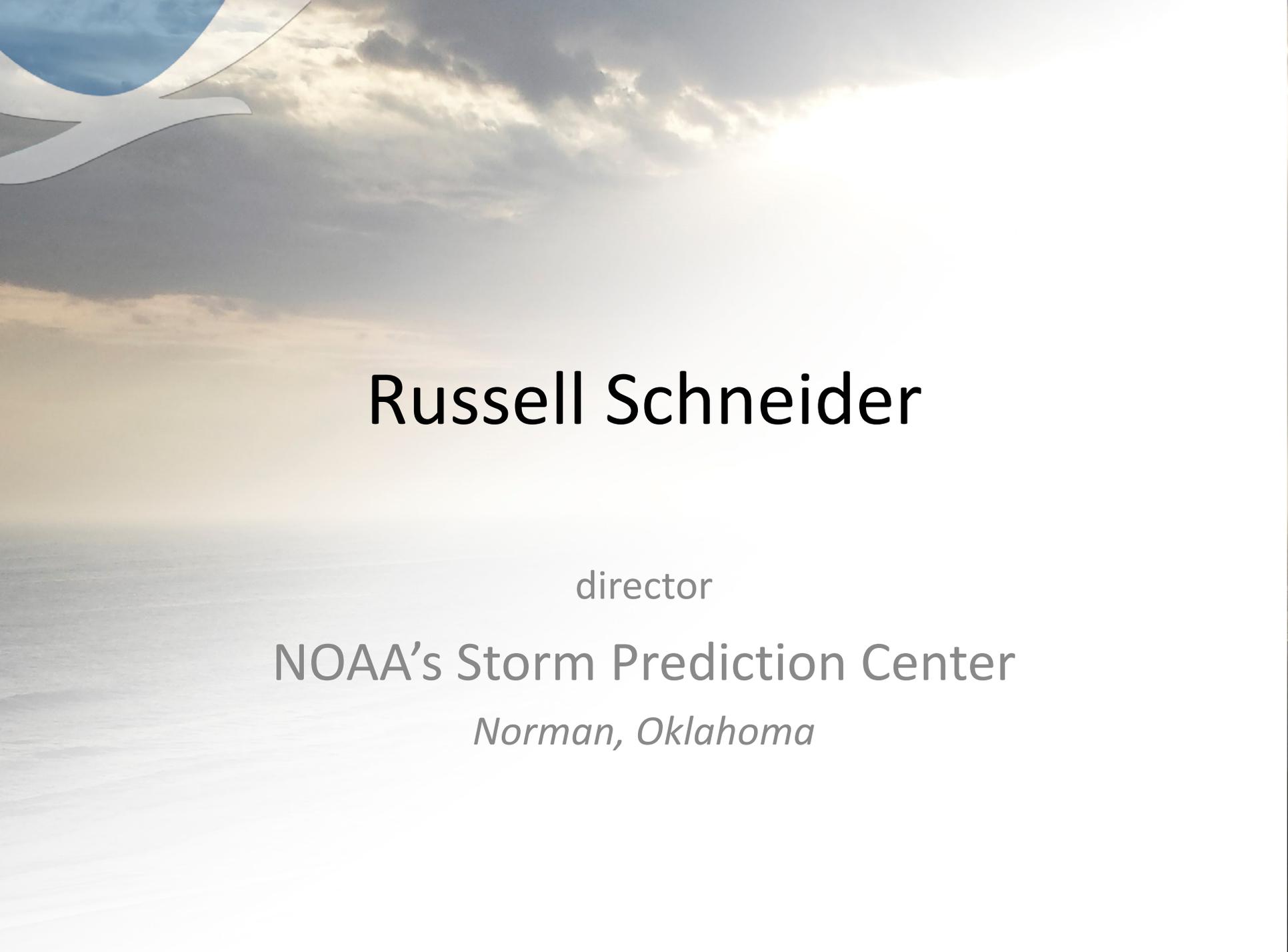
“Everything looked clear and then all of the sudden all of our phones went off...we all hit shelter” - The Kansas City Star



Rose Hill, MS (January 3, 2015) – Tornado destroyed 10 mobile homes. No injuries.

“I was...very nervous and scared. I didn't know what the outcome would be. We just took heed to the warning that we had received on our iPhone.” – Jalesa Barnes on WTOK News Center 11





Russell Schneider

director

NOAA's Storm Prediction Center

Norman, Oklahoma

Weather Ready Nation: A Vital Conversation

December 13 - 15, 2011
Norman, OK



Goal: reduce the loss of life and mitigate the social and economic impacts of severe weather



NOAA

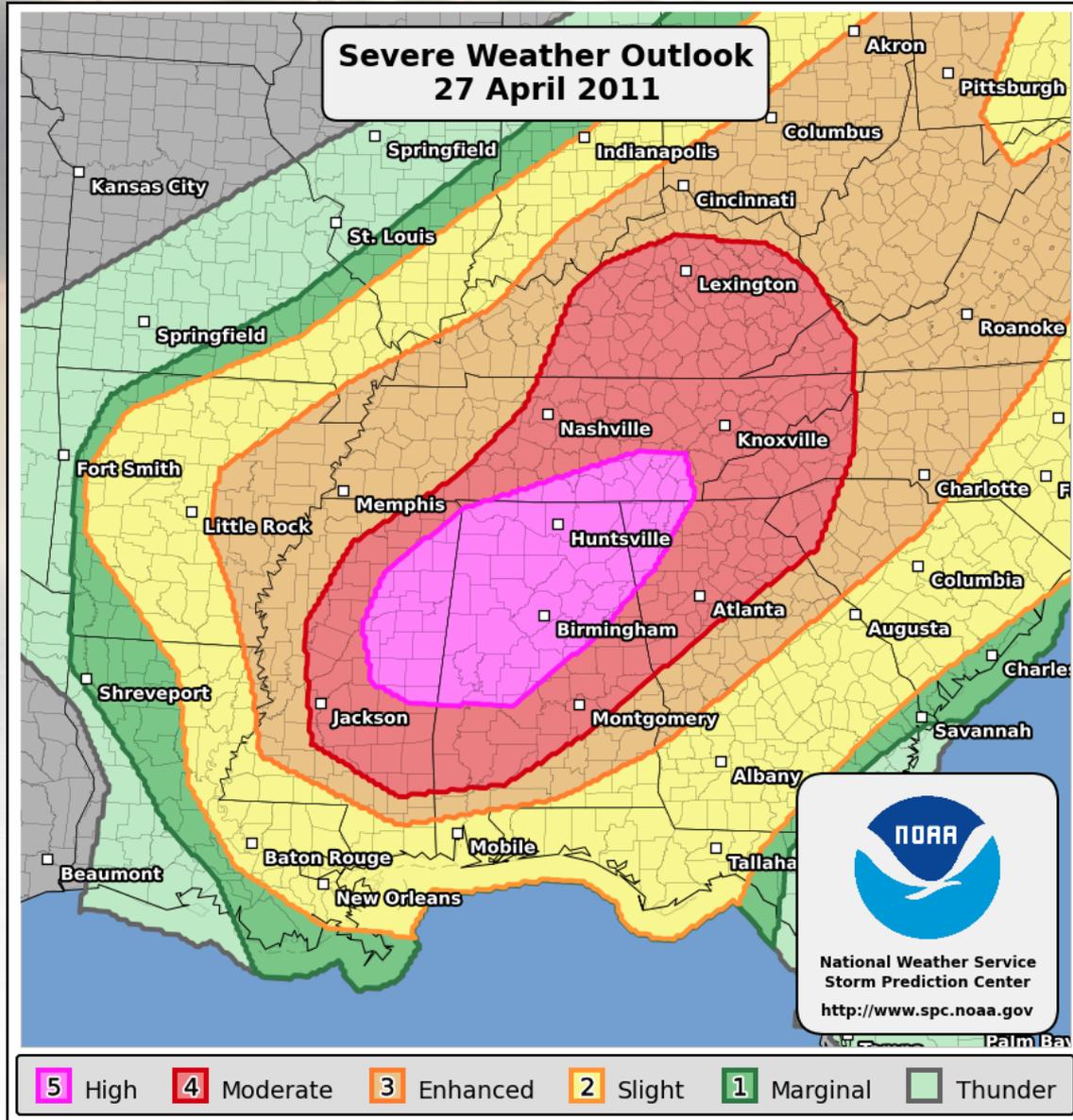


NOAA



NOAA

SPC Severe Weather Outlook



Efforts in Hazard Communication

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
<p>No severe* thunderstorms expected</p> <p>Lightning/flooding threats exist with <u>all</u> thunderstorms</p>	<p>Isolated severe thunderstorms possible</p> <p>Limited in duration and/or coverage and/or intensity</p>	<p>Scattered severe storms possible</p> <p>Short-lived and/or not widespread, isolated intense storms possible</p>	<p>Numerous severe storms possible</p> <p>More persistent and/or widespread, a few intense</p>	<p>Widespread severe storms likely</p> <p>Long-lived, widespread and intense</p>	<p>Widespread severe storms expected</p> <p>Long-lived, very widespread and particularly intense</p>
					
<ul style="list-style-type: none"> • Winds to 40 mph • Small hail 	<ul style="list-style-type: none"> • Winds 40-60 mph • Hail up to 1" • Low tornado risk 	<ul style="list-style-type: none"> • One or two tornadoes • Reports of strong winds/wind damage • Hail ~1", isolated 2" 	<ul style="list-style-type: none"> • A few tornadoes • Several reports of wind damage • Damaging hail, 1 - 2" 	<ul style="list-style-type: none"> • Strong tornadoes • Widespread wind damage • Destructive hail, 2" + 	<ul style="list-style-type: none"> • Tornado outbreak • Derecho

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.

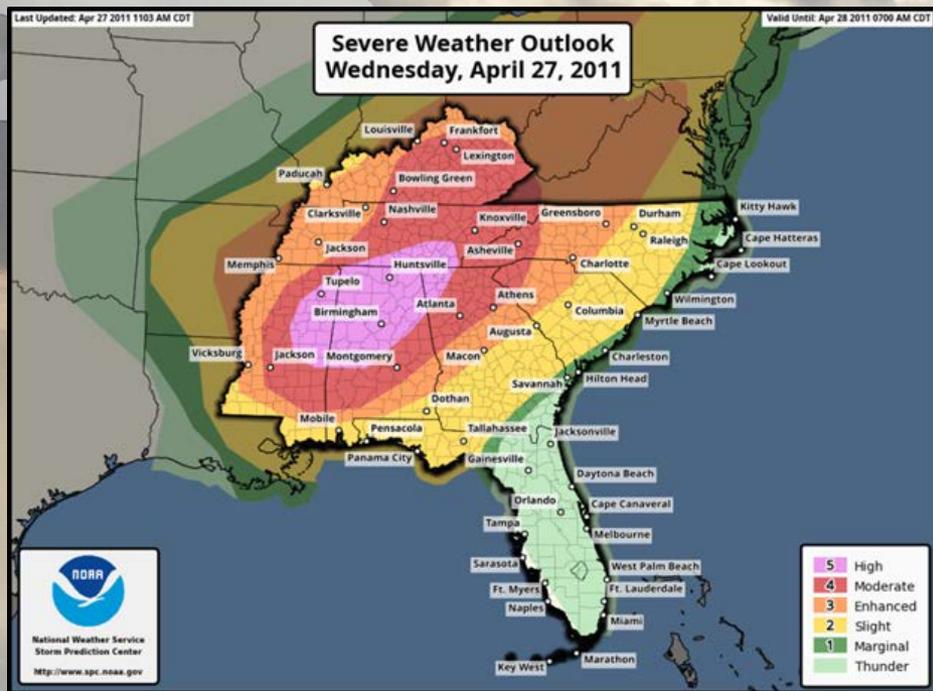


National Weather Service

www.spc.noaa.gov



FEMA Partnership – FEMA Liaison at SPC



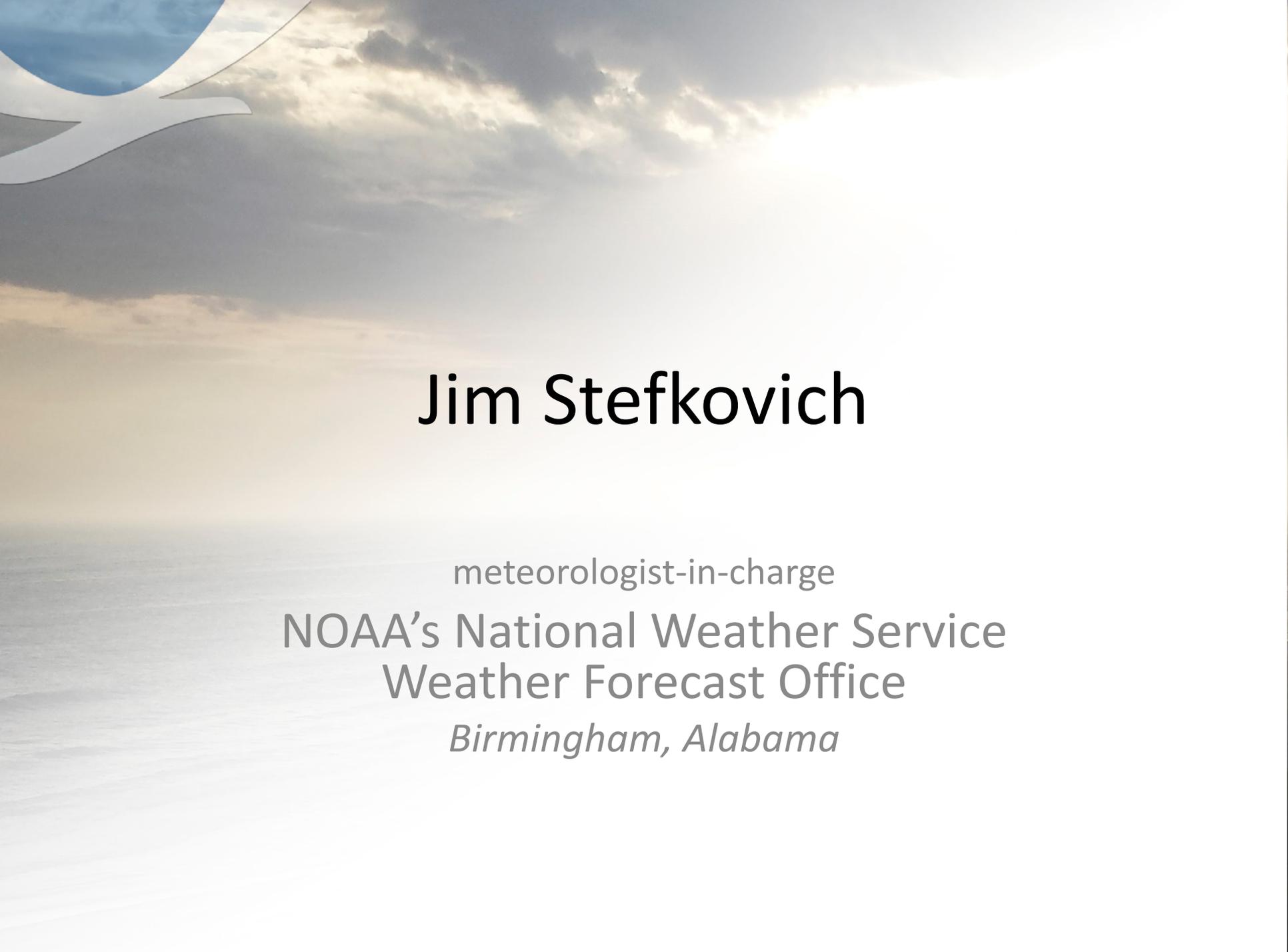
NOAA Hazardous Weather Testbed



Participants **test** and **evaluate** emerging technologies and science for National Weather Service operations.

Conceptual framework and physical space to foster **collaboration** between **research** and **operations**.





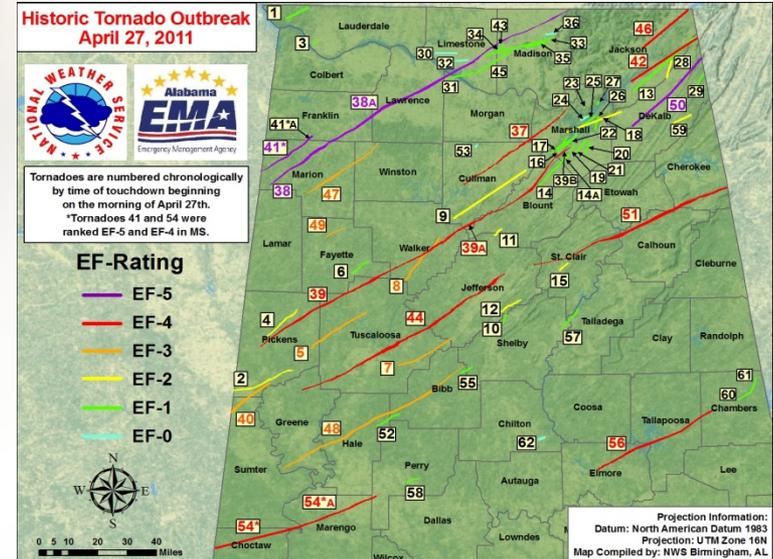
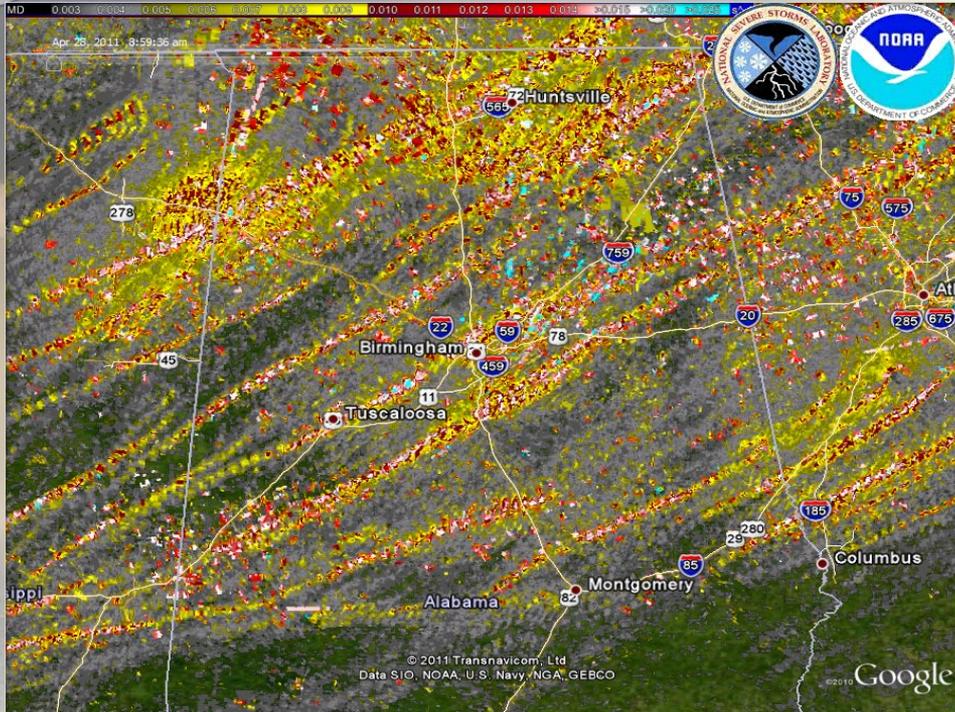
Jim Stefkovich

meteorologist-in-charge

NOAA's National Weather Service
Weather Forecast Office

Birmingham, Alabama

April 2011 - Historic month for Alabama – 109 total tornadoes, 260 fatalities



Tornado tracks: 4/27/11 tornadoes

- Total track length from 4/27/11 tornadoes was more than 1,200 miles – distance driving from Birmingham to Boston
- National Weather Service offices provided detailed Decision Support Services (DSS) days before the event to weeks



Improved Communication:

- Social science research shows need for confirmation before taking action
- Integrated Warning Teams (IWT) help provide consistent message to public
- Increased use of social media: Facebook, Twitter, Periscope
- Impact Based Warnings (IBW) implemented nationwide to effectively communicate threat

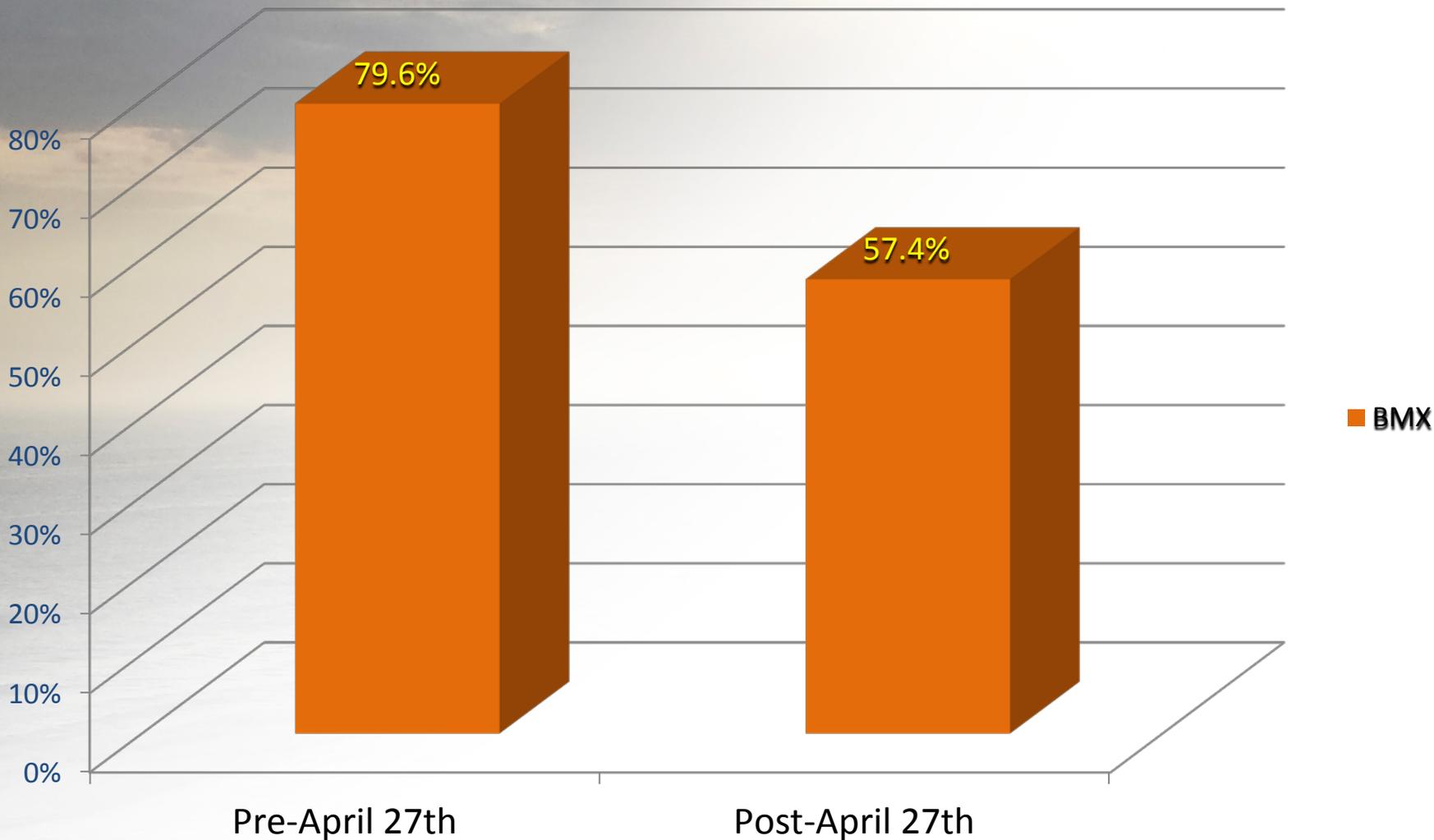
New Technology: Dual Polarization Radar installed nationwide in 2012-2013 ¹⁸



Birmingham
Alabama

Tornado Warning Performance

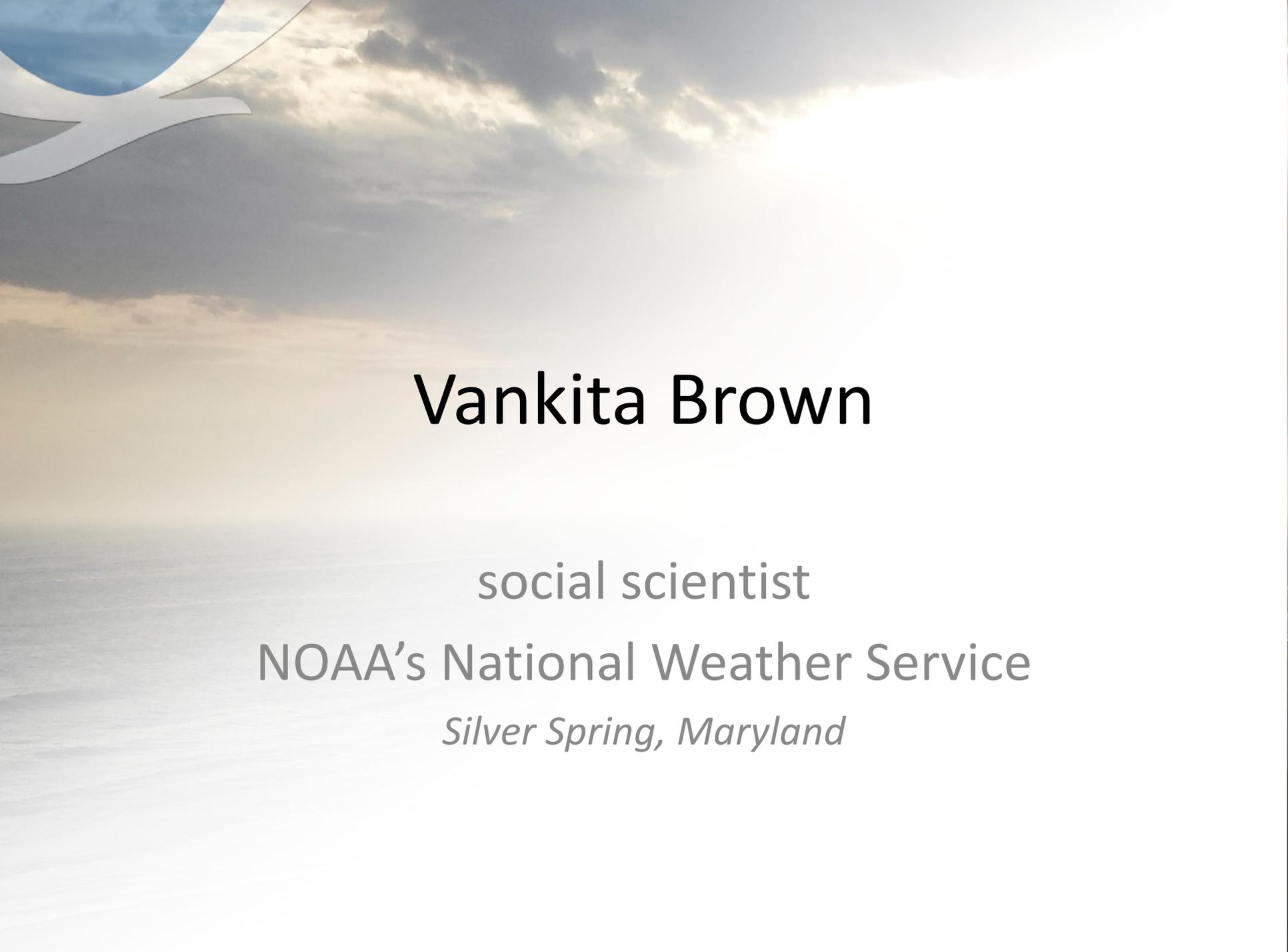
False Alarm Rate



Source NWS Verification

NWSBirmingham





Vankita Brown

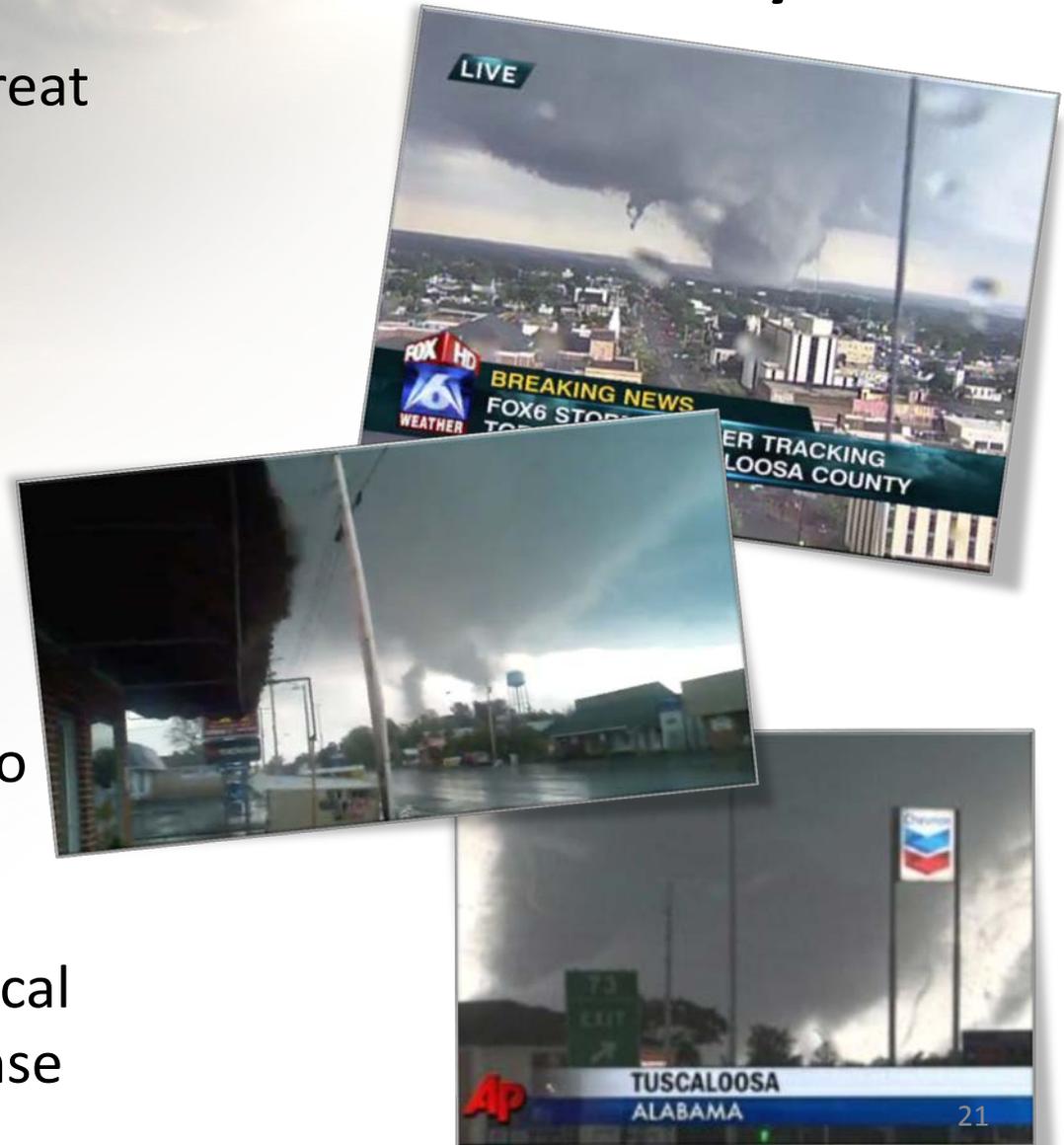
social scientist

NOAA's National Weather Service

Silver Spring, Maryland

Confirmation & Consistency

- The need to confirm the threat is important for risk personalization
- Verification from social networks (friends, family, colleagues)
- Visual verification becomes important, but is a barrier to protective action
- Message consistency is critical for protective action response



Messaging Improvements & Innovations

TORNADOES IN HILLY OR MOUNTAINOUS TERRAIN ARE HARD TO SEE. **DO NOT WAIT TO SEE OR HEAR THE TORNADO** - GO TO A SAFE PLACE NOW!

DO NOT RUN OUTSIDE TO FIND THE TORNADO - TAKE COVER NOW!



Rick Smith
@ounwcm

It's shelter cleaning time in Oklahoma. First time since last May 22nd. We are ready. #okwx
ow.ly/i/z0OR

Follow

Personal plea

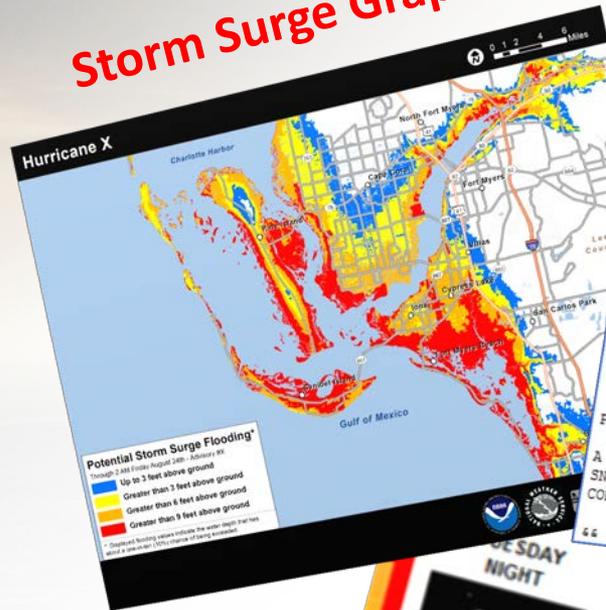
- If you are being asked to evacuate a coastal location by state and local officials, please do so.
- If you are reluctant to evacuate, and you know someone who rode out the '62 storm on the barrier islands, ask them if they would do it again.
- If you are still reluctant, think about your loved ones, think about the emergency responders who will be unable to reach you when you make the panicked phone call to be rescued, think about the rescue/recovery teams who will rescue you if you are injured or recover your remains if you do not survive.
- Sandy is an extremely dangerous storm. There will be major property damage, injuries are probably unavoidable, but the goal is **zero fatalities**.
- If you think the storm is over-hyped and exaggerated, please err on the side of caution. You can call me up on Friday (contact information is at the end of this briefing) and yell at me all you want.
- I will listen to your concerns and comments, but I will tell you in advance, I will be very happy that you are alive & well, no matter how much you yell at me.
- Thanks for listening.
- Gary Szatkowski - National Weather Service Mount Holly

National Weather Service
Philadelphia Mt. Holly

THIS TORNADO IS WRAPPED IN RAIN - IF YOU WAIT UNTIL YOU SEE OR HEAR IT COMING IT MAY BE TOO LATE TO GET TO A SAFE PLACE. TAKE COVER NOW!

User-Centric Products/Services

Storm Surge Graphic



Hurricane Local Statement

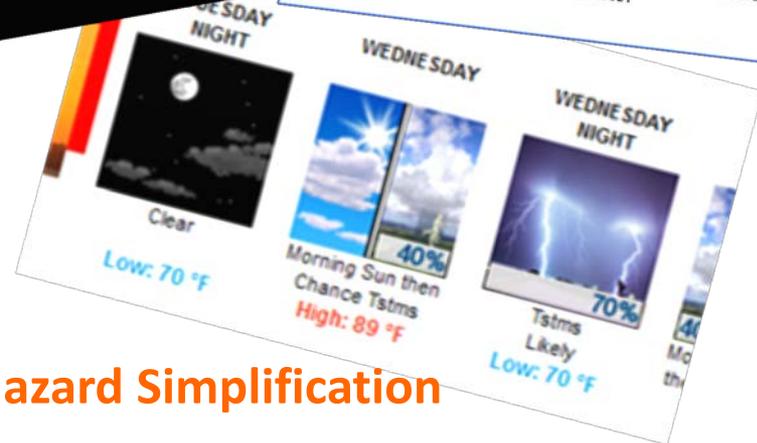
... WINTER STORM WATCH REMAINS IN EFFECT FROM FRIDAY MORNING THROUGH LATE FRIDAY NIGHT...

- LOCATIONS... ALL OF EAST CENTRAL NEW YORK AND ADJACENT WESTERN NEW ENGLAND.
- HAZARD TYPES... HEAVY SNOW POSSIBLE.
- ACCUMULATIONS... SNOW ACCUMULATIONS OF 9 INCHES OR MORE ARE POSSIBLE FRIDAY INTO FRIDAY NIGHT.
- MAXIMUM SNOWFALL RATES... SNOW RATES MAY EXCEED ONE INCH PER HOUR DURING FRIDAY EVENING.
- TIMING... SNOW WILL BEGIN FRIDAY MORNING... AND BECOME STEADIER AND HEAVIER BY LATE FRIDAY AFTERNOON. THE HEAVIEST SNOWFALL WILL OCCUR ON FRIDAY EVENING... BEFORE TAPERING OFF SATURDAY MORNING.
- IMPACTS... SNOW COVERED ROADS AND REDUCED VISIBILITY WILL MAKE FOR DANGEROUS TRAVEL.
- WINDS... NORTHEAST 10 TO 20 MPH WITH GUSTS 30 TO 35 MPH.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WINTER STORM WATCH MEANS THERE IS A POTENTIAL FOR SIGNIFICANT SNOW... SLEET... OR ICE ACCUMULATIONS THAT MAY IMPACT TRAVEL. CONTINUE TO MONITOR THE LATEST FORECASTS.

Stakeholder Engagement



Forecast At A Glance

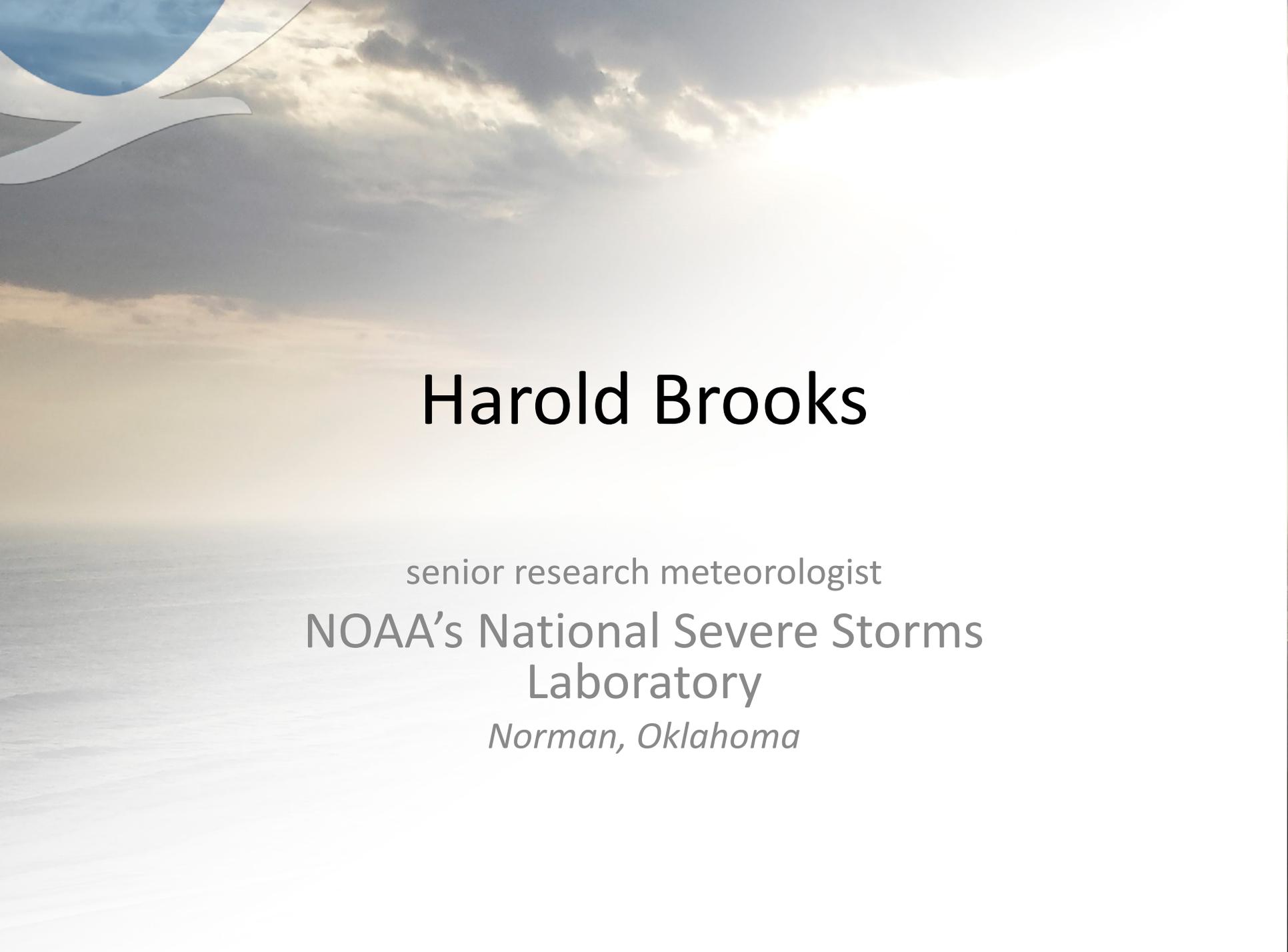
Hazard Simplification

- Include partners and users in product and service development
- Creates a more informed product development process
- Creating products that are the most valuable to users

Relationships & Impact-Based Decision Support Services (IDSS)



- Relationships and great customer service is the hallmark of our work
- Leveraging relationships to build source credibility
- Engaging communities to build relationships and extend outreach and education

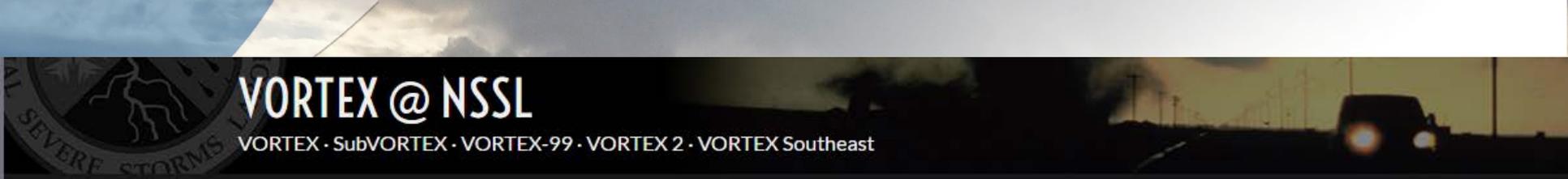


Harold Brooks

senior research meteorologist

NOAA's National Severe Storms
Laboratory

Norman, Oklahoma



VORTEX @ NSSL

VORTEX · SubVORTEX · VORTEX-99 · VORTEX 2 · VORTEX Southeast



VORTEX SOUTHEAST

- [ABOUT NSSL](#)
- [WEATHER RESEARCH](#)
- [RESEARCH TOOLS](#)
- [PROJECTS](#)
- [PEOPLE](#)
- [NEWS & MEDIA](#)
- [EDUCATION](#)

[NSSL Home](#) > [Projects](#) > [VORTEX Southeast](#)

VORTEX Southeast

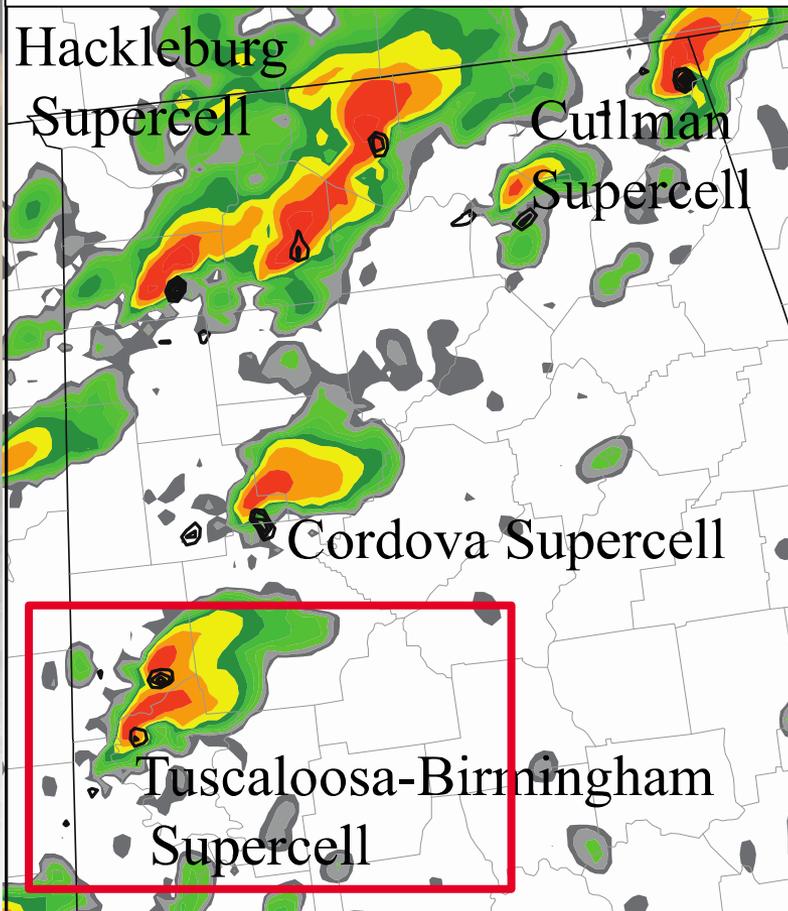
The **Verification of the Origins of Rotation in Tornadoes EXperiment-Southeast (VORTEX-SE)** is a research program to understand how environmental factors characteristic of the southeastern United States affect the formation, intensity, structure, and path of tornadoes in this region. VORTEX-SE will also determine the best methods for communicating forecast uncertainty related to these events to the public, and evaluate public response. In many ways, VORTEX-SE represents a new approach to tornado research in general.

VORTEX-SE Info

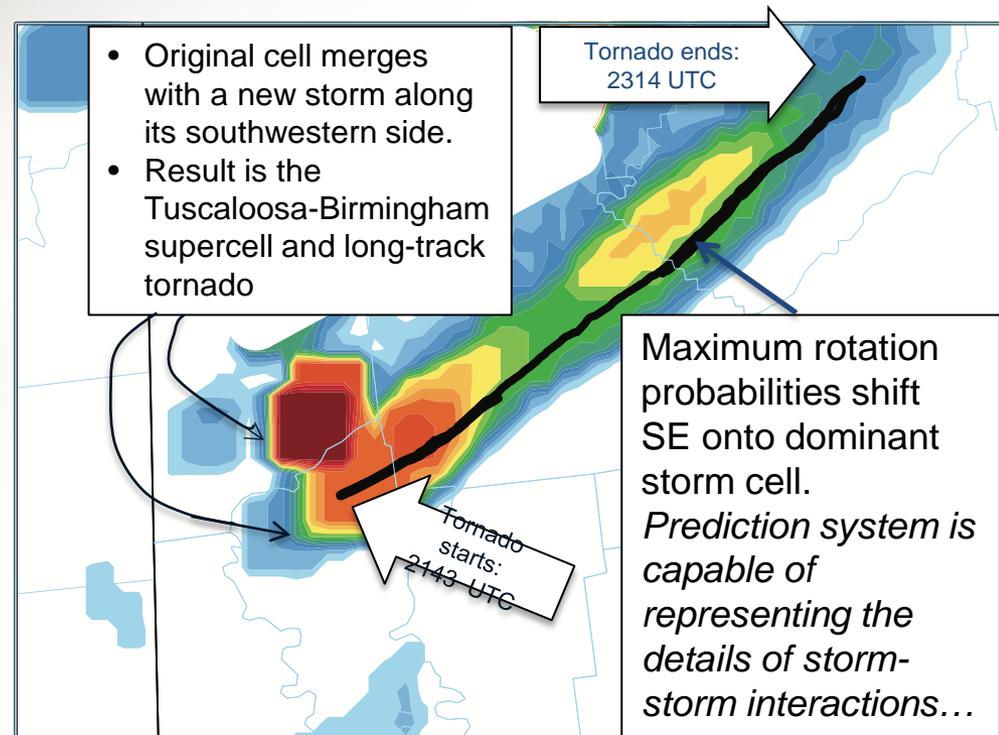
- [VORTEX-SE Home](#)
- [VORTEX-SE Topics & Impacts](#)
- [VORTEX-SE Supported Research](#)
- [VORTEX-SE Schedule of Events](#)

Warn-On-Forecast Prototype

Model Reflectivity Analysis
Valid: 2130 UTC



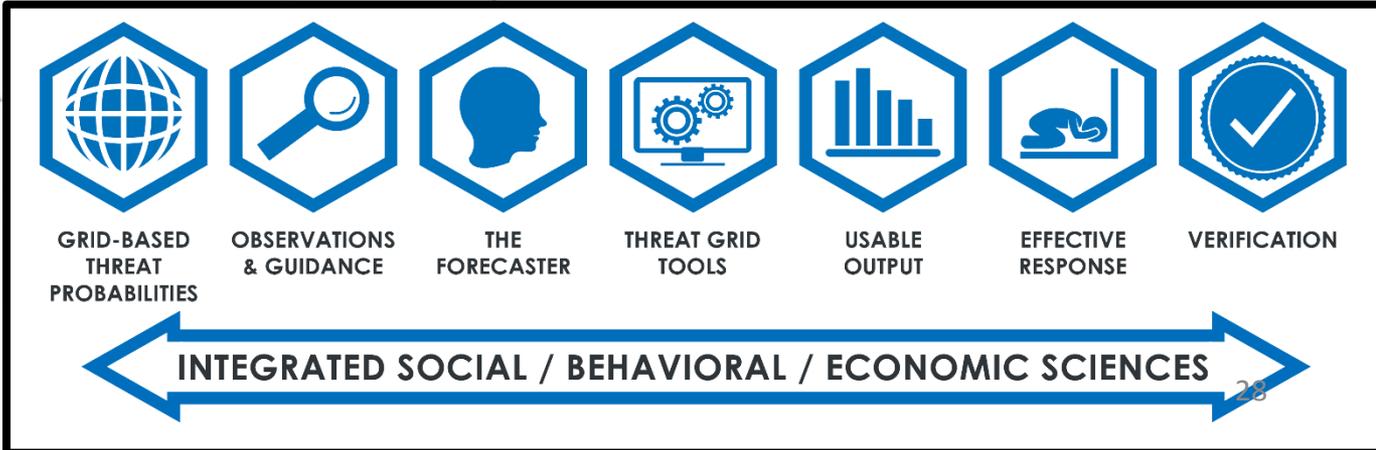
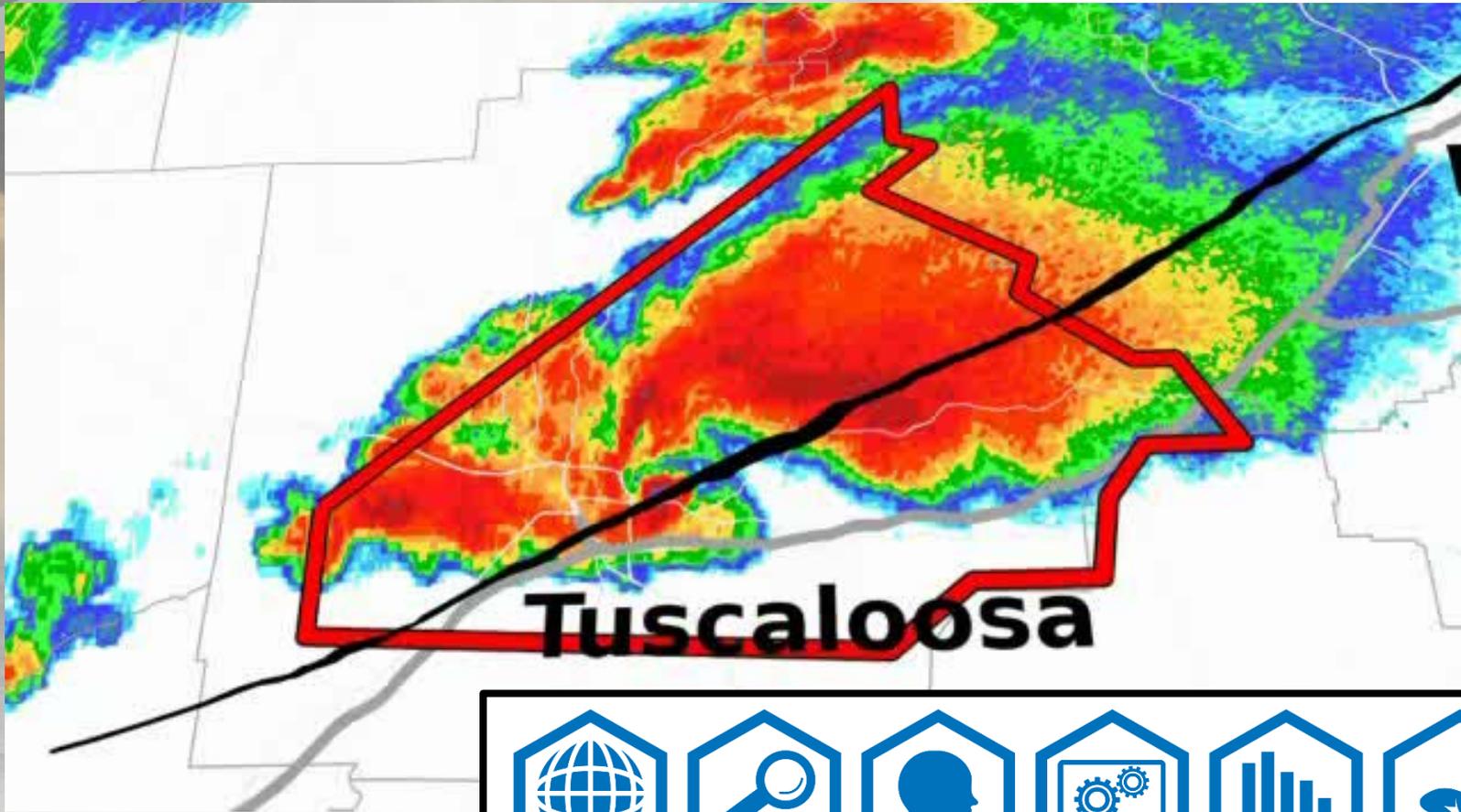
30 Minutes Later: Rotation Track Prediction
Valid: 2130-2315 UTC (105 min forecast)
Southwestern cell becomes dominant.....



Probability



Forecasting a Continuum of Environmental Threats (FACETs)



Five Years Later: Looking Back at the Deadly 2011 Tornado Season

SPEAKERS:

- **Laura Furgione, deputy director, NOAA's National Weather Service**
- **Russell Schneider, director, NOAA's Storm Prediction Center**
- **Jim Stefkovich, meteorologist-in-charge, NOAA's National Weather Service Birmingham (Alabama) Weather Forecast Office**
- **Vankita Brown, social scientist, NOAA's National Weather Service**
- **Harold Brooks, senior research meteorologist, NOAA's National Severe Storms Laboratory**