

Decision-Support: An NWS Initiative

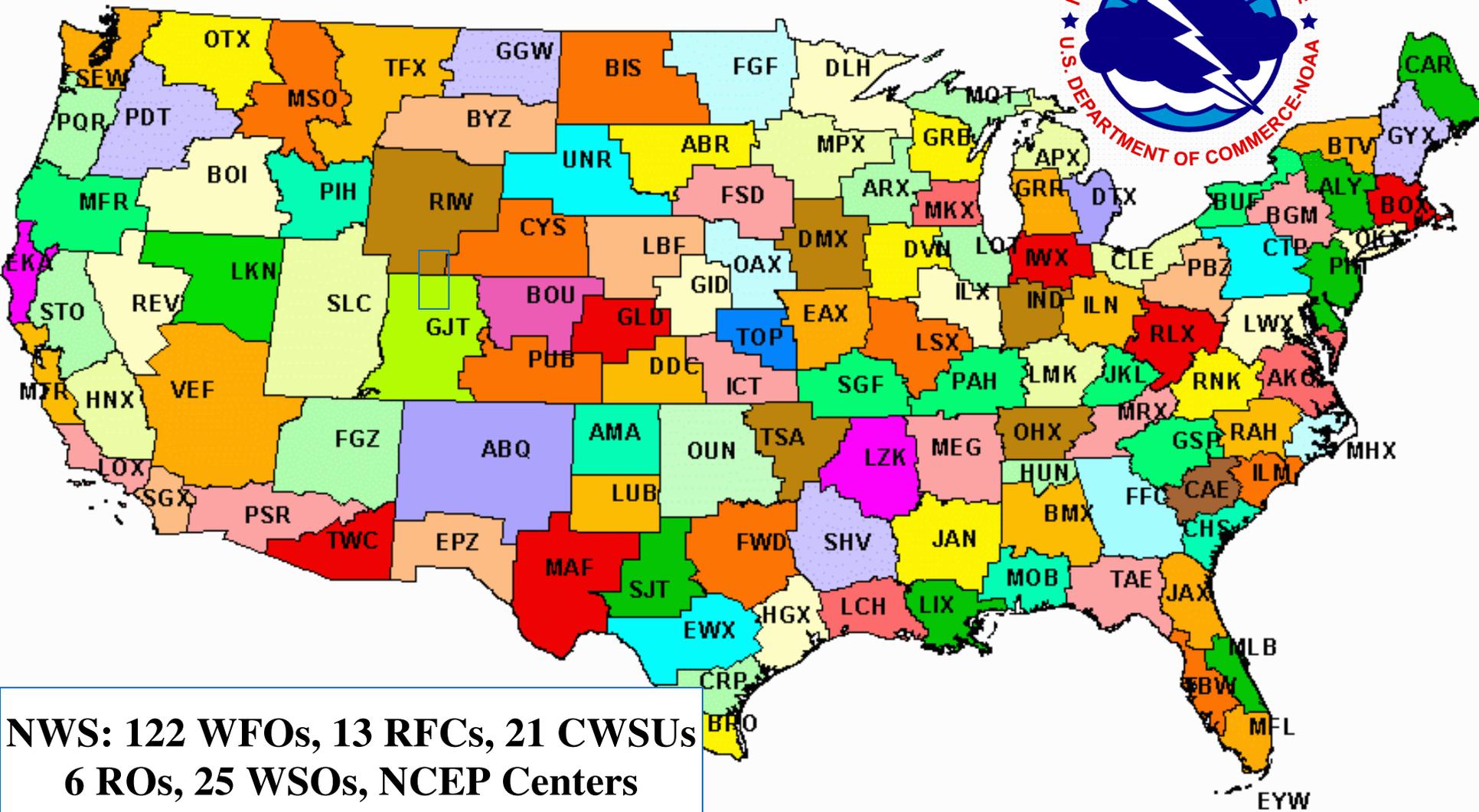


**How your National Weather Service is
advancing
all-hazards decision-support
for... **a more resilient homeland !****

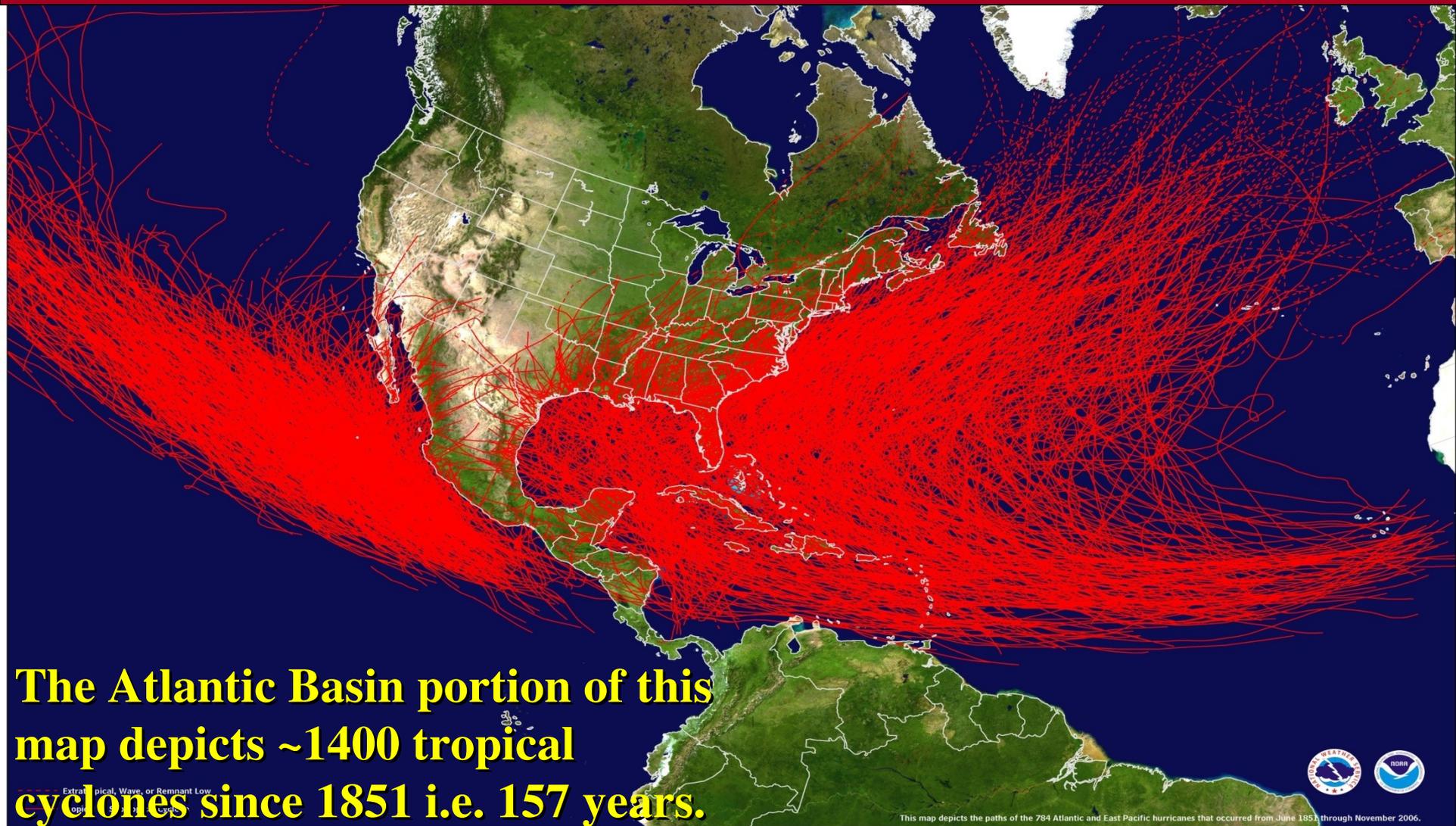
**National Severe Storms Workshop
Norman, OK - March 6, 2009**

**Bill Proenza, Regional Director
National Weather Service - Southern
Region**

EMs, state/local govts...need their nearby **WFO's** local weather info & for their decision-making



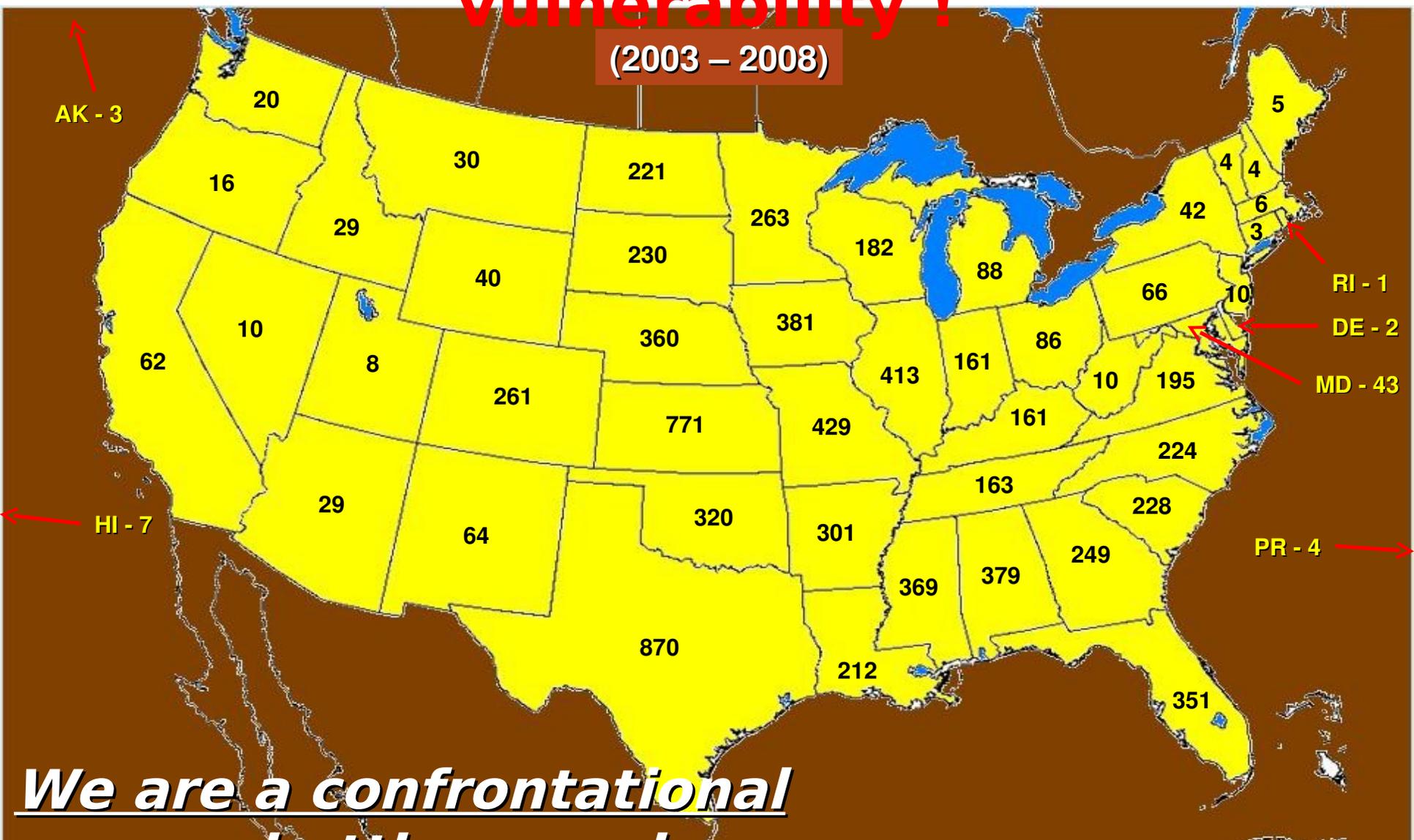
**We know we're hurricane vulnerable...
but OUR awareness is not compelling enough!**





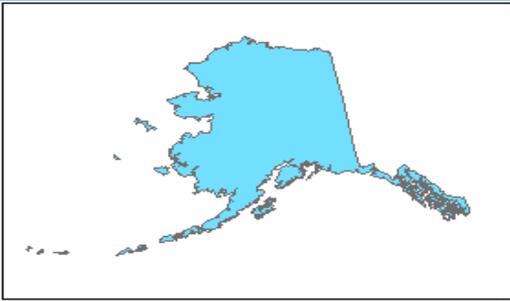
8386 tornadoes in 6 years. The USA has a tornado vulnerability !

(2003 - 2008)

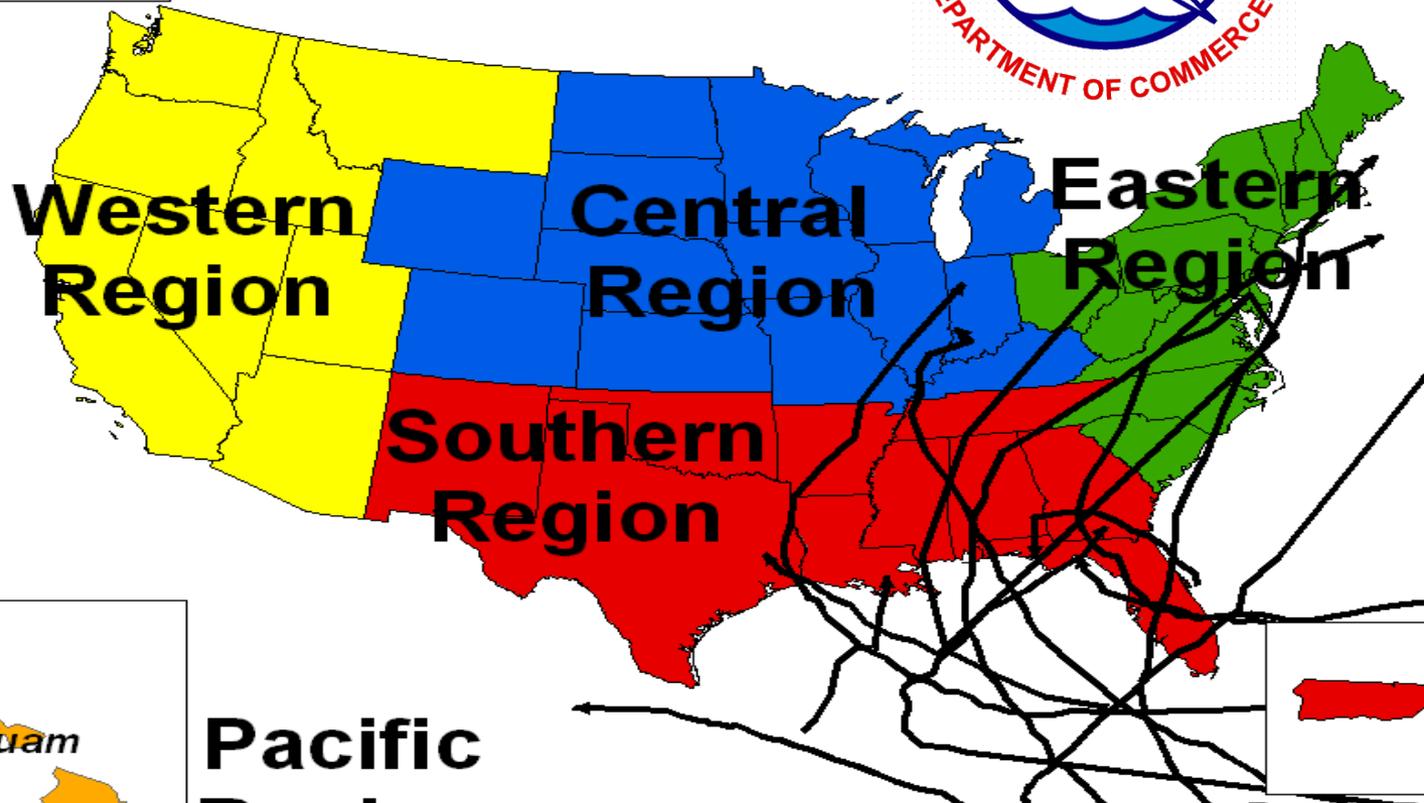
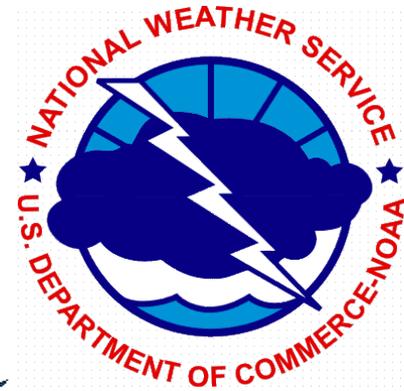


**We are a confrontational
battleground:**

NWS has 4 large contiguous Regions and 2 “oconus” Regions



**Alaska
Region**



**Western
Region**

**Central
Region**

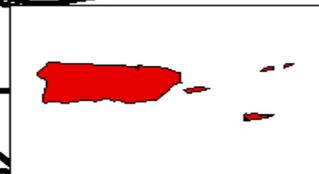
**Eastern
Region**

**Southern
Region**



Hawaii and Guam

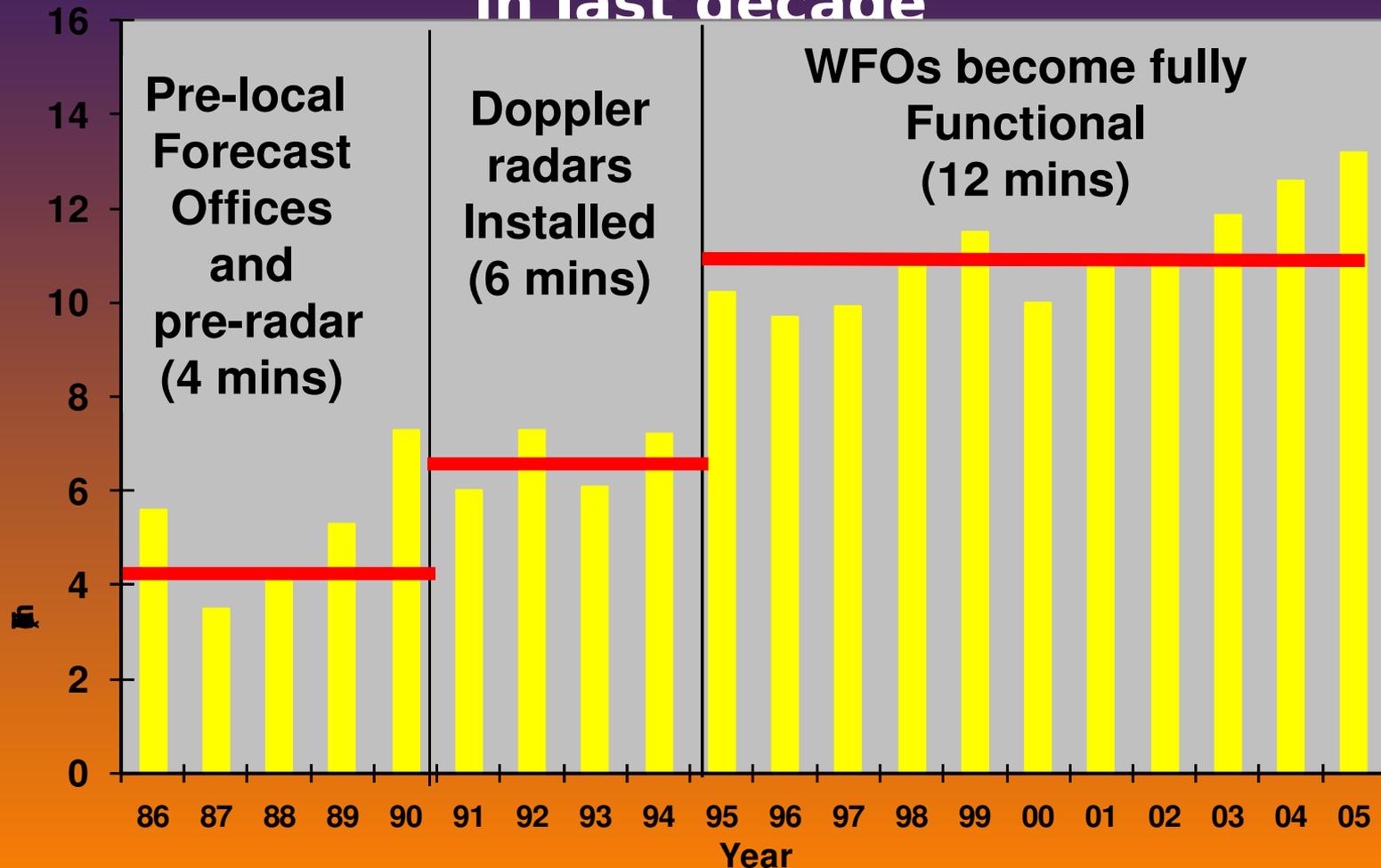
**Pacific
Region**



*Puerto Rico and
Virgin Islands*

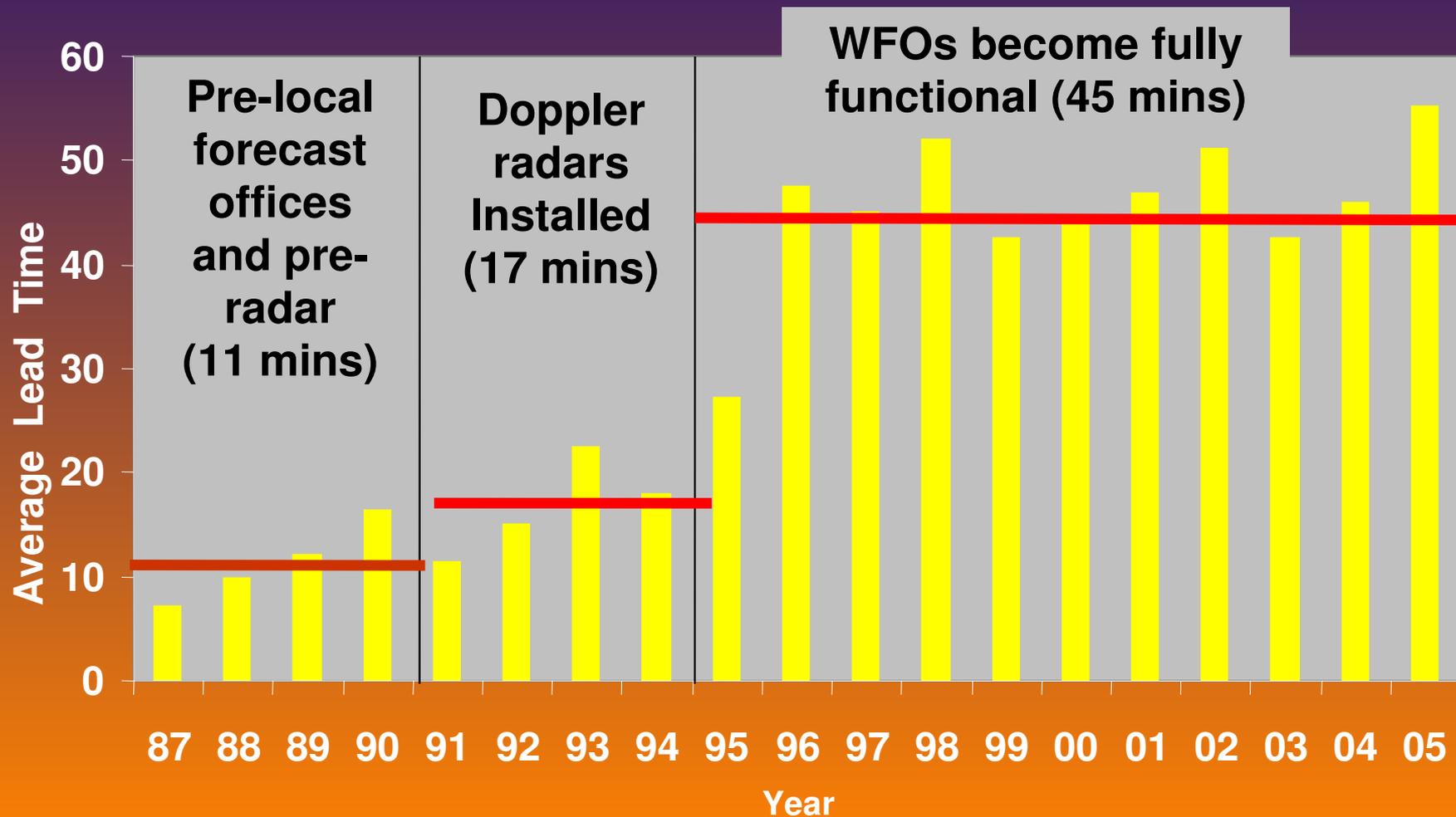
Tripled Tornado Warning Lead Times

but improvement pace mostly has leveled-out in last decade

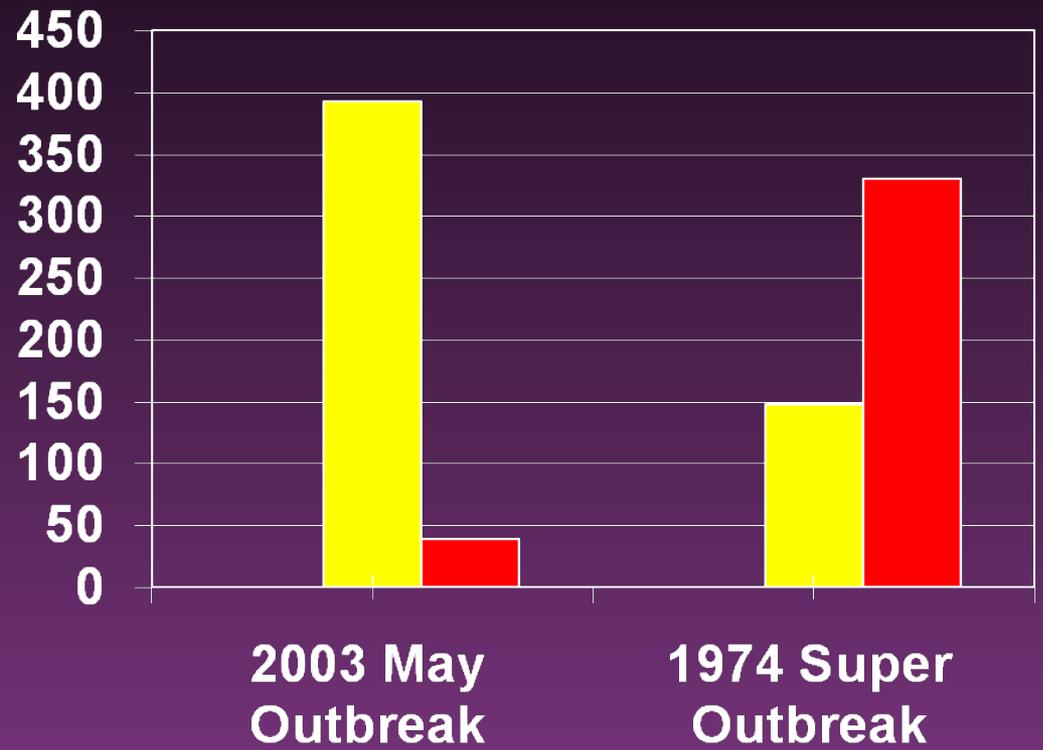


Quadrupled Flash-Flood Warning Lead Times

but we direly need “sci-tech” infusion to improve

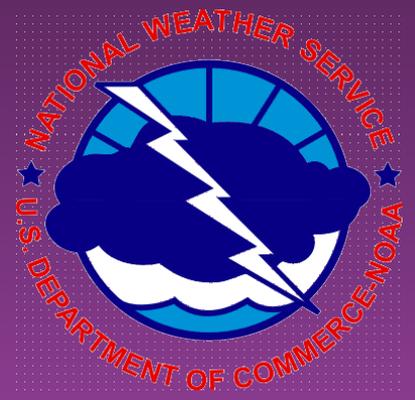


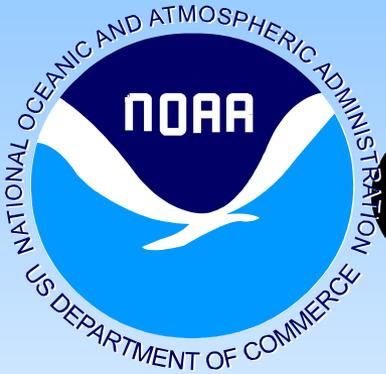
Local WFO warnings in '03 tornado outbreak w/ 2.5 times the total tornadoes in '74 we had 1/10 the deaths, modernization is saving lives!



Tornadoes
340 versus 148
Fatalities
39 versus 330

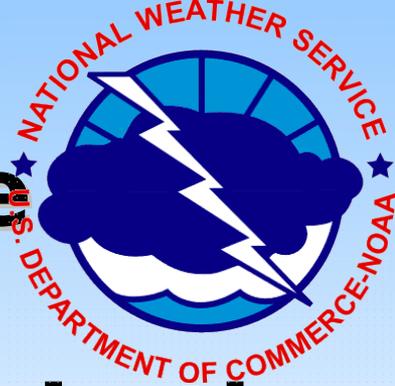
Avg 19 minute leadtime	Avg 4 minute leadtime
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"ER-Mets"

**(Emergency Response
Meteorologists)**



**Enabling our vital partners in the
emergency management/PD/local
government community can
immediately request from their
WFO an on-site forecaster
(state/local EOC or field command
center) to provide decision-
support during both natural and
human derived high impact**

Meteorologists ...24x7 local “ER-Met” Teams !

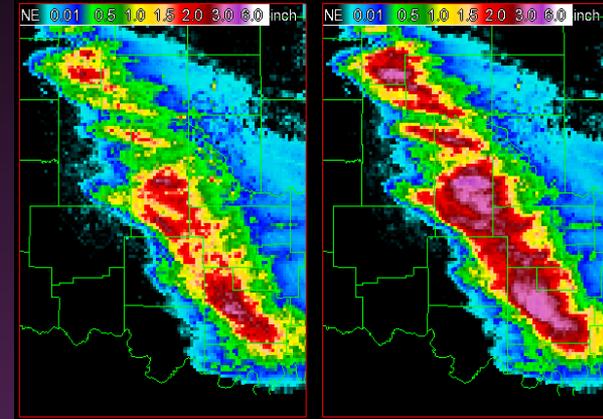
Background

• Our Nation, its EMs & other “high-impact” decision-makers are increasingly challenged by natural & unnatural events

• Local/state/federal EMs (& other users) tell us they vitally need *focused/direct/on-site* decision-assisting weather info

• We’ve had many high-impact seasons:

- Tornadoes of 2003, 2004 & 2008
- Hurricanes of 2004 & 2005
- Southern & Western fires of 2005, 2006, 2007, 2008



Meteorologists ...24x7 local “ER-Met” Team proposal.

Vital focused/direct weather support from NWS WFOs, RFCs & regional headquarters for decision assistance to local/state/federal emergency managers, government officials, water/energy managers etc. before, during and after high-impact events to mitigate loss of life and support our Nation’s economic wellbeing...

The collage illustrates the ER-Met team's services through several key components:

- Product request:** A screenshot of a "BOISE SPOT FORECAST REQUEST" form, showing fields for "Product Requested" and "Requesting Agency".
- Web Briefing:** A screenshot of a "SkywarnEM Weather Briefing" page, featuring a "Last briefing update: Thursday 8/23/2007 10:29 UTC" and a "Weather activation not expected today or tonight" message. A map shows "SIGNIFICANT FLOODING REMAINS POSSIBLE THIS MORNING AND AFTERNOON WITH RAIN RATES NEAR 2 INCHES-7".
- Recorded Briefing:** A screenshot of a "San Angelo, TX" "Experimental Daily Multimedia Weather Briefing" page, including a "Text Summary" and "Auto Only Briefing (*.mp3)" link. A "RAINFALL ESTIMATES FROM RADAR (8/1)" chart is also visible.
- Live Virtual Briefing:** A screenshot of a "Scattered Showers and T-storms" weather map with a "Moving Southwest" label.
- IC Center On-site:** A photograph of a control room with multiple large monitors displaying weather data and maps, with staff members working at desks.
- IC Incident On-site:** A photograph of an outdoor emergency scene with several people in high-visibility vests and equipment, including a large white tent.

Region's "test-bedding" has determined...

- NWS decision-support highly lauded by EMs, first responders, RAs, local/state government other federal agencies as critical to the protection of life.
- NWS decision-support must be immediate, 24x7, from our office, or to their command center or at the event site.
- NWS office staffing is currently too limited to provide immediate response especially during active weather.

Web Briefing



Live Virtual Briefing



IC Center On-site

IC Incident On-site



Bottom line - NWS is critically needed by local/state/federal decision makers but insufficient staffing & aging tech is a limiting factor!

team proposal

What resources do we need?

- At each WFO, an additional 3 positions (program leader, training met, IT/system/ET/met) enabling offices to immediately self-deploy (24x7)
- Technological/science needs
 - Science (e.g. local severe weather & dispersion modeling etc.) and observations (e.g. nat'l mesonet & next generation radar network)
 - Advanced multi-faceted hardware/software infrastructure for remote and on-site WFO briefings of EOC or command centers (e.g. laptops, GIS, Web support, briefing tables & monitors etc.)
- Training & certification available for entire WFO met staff (“the team”)
 - Science & briefing skills
 - Technological knowledge
- Fiscal resources for on-site services (e.g., per diem & OT pool) and to evolve NWS support to meet local/state/federal decision-maker needs



New Radar Technology

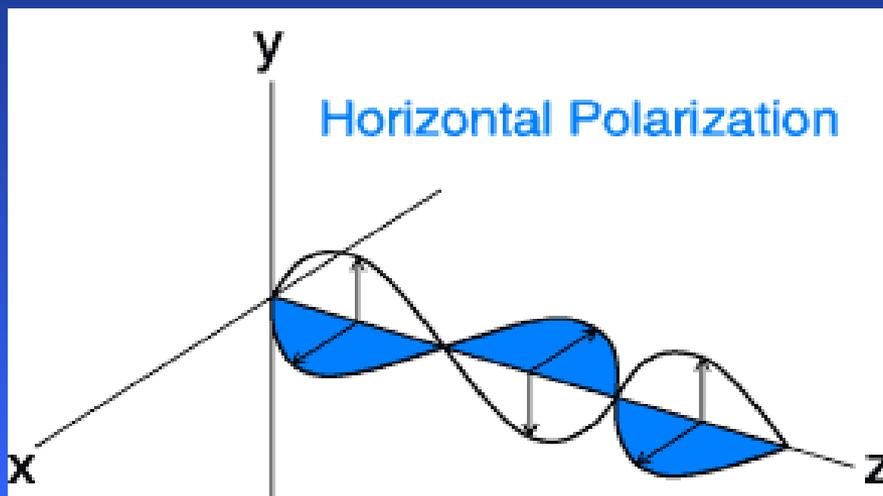
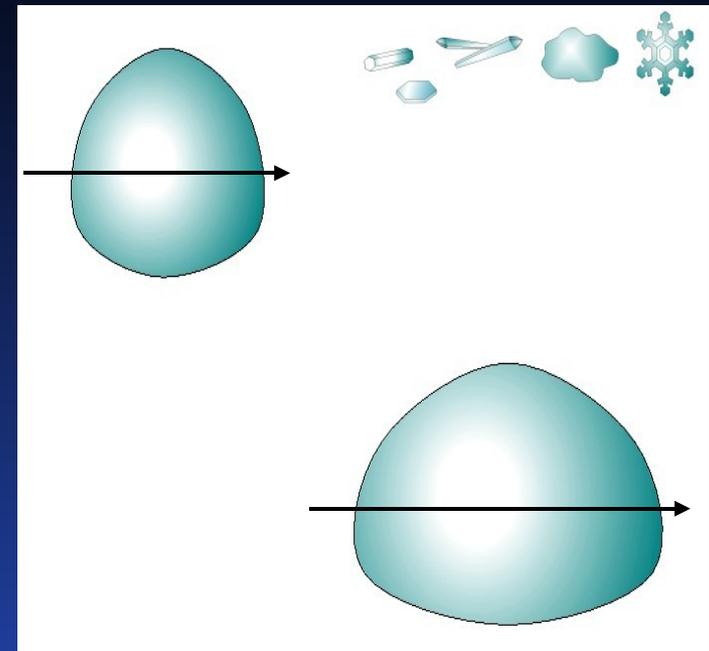
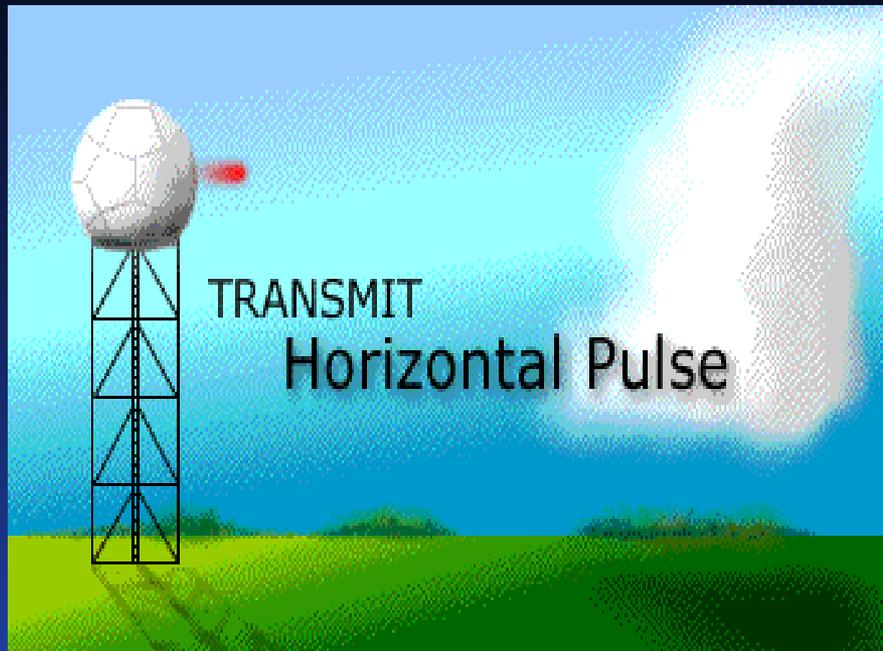
- **Recent Radar Enhancements**
 - ◆ Improved elevation scans
 - ◆ Faster “volume scans”
- **Dual-Pol Radar (1 to 5 yrs)**
 - ◆ Improved resolution, storm structure imaging & velocity data
 - ◆ Longer severe weather leadtimes
 - ◆ Improved precipitation detection and flood warning lead-times
- **Phased Array Doppler (10+ yrs)**
 - ◆ With 30 second “volume scans” adding 4+ minutes to tornado lead-times.
 - ◆ Highest resolution on velocity data, imaging, precip type !





Current WSR-88D Radar

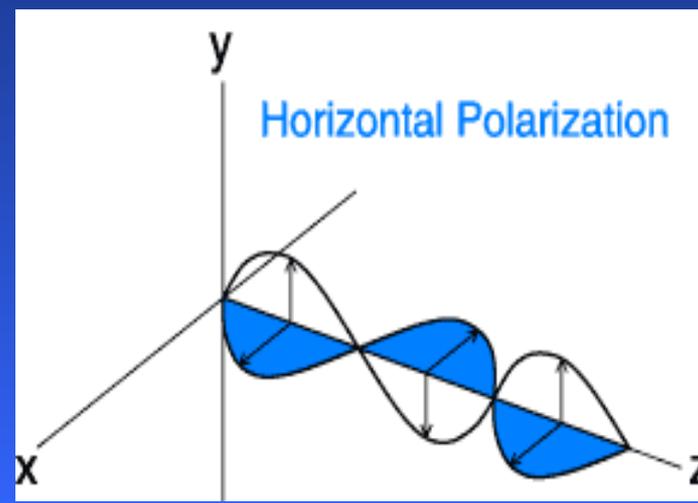
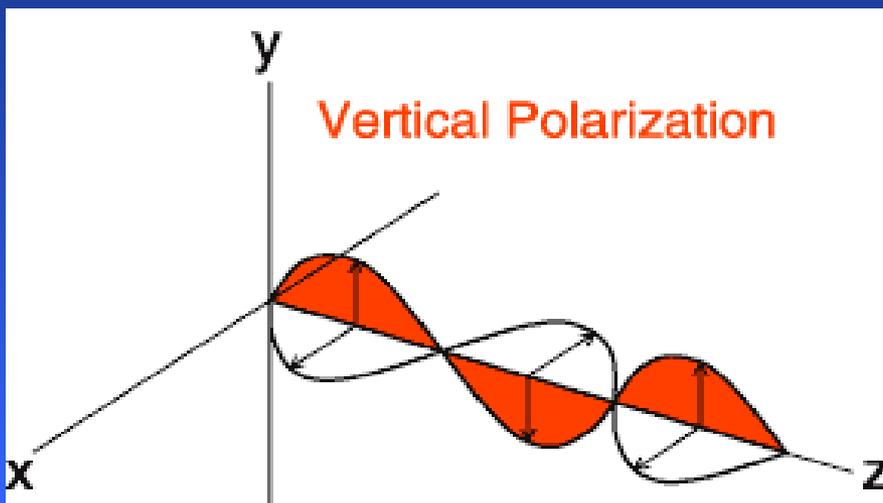
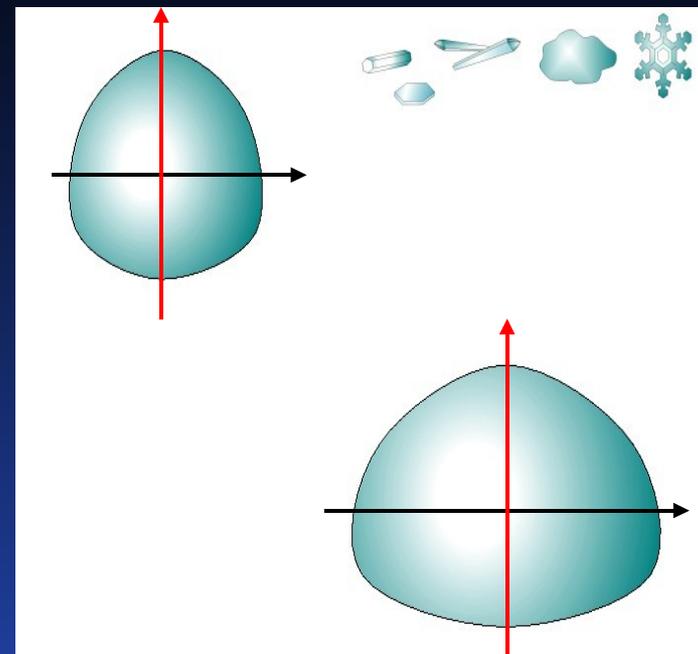
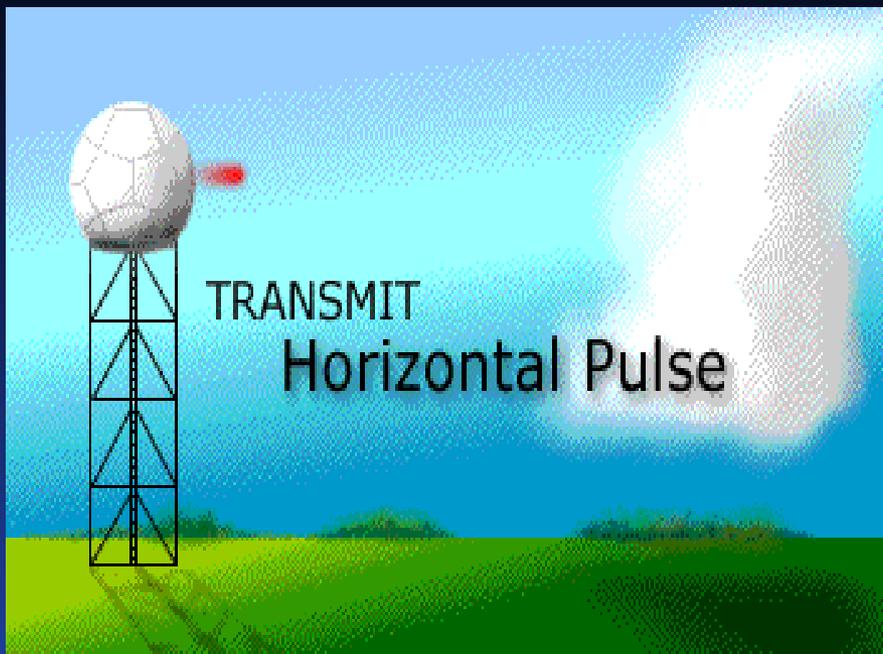
NWS Southern Region





Dual-polarization Radar

NWS Southern Region

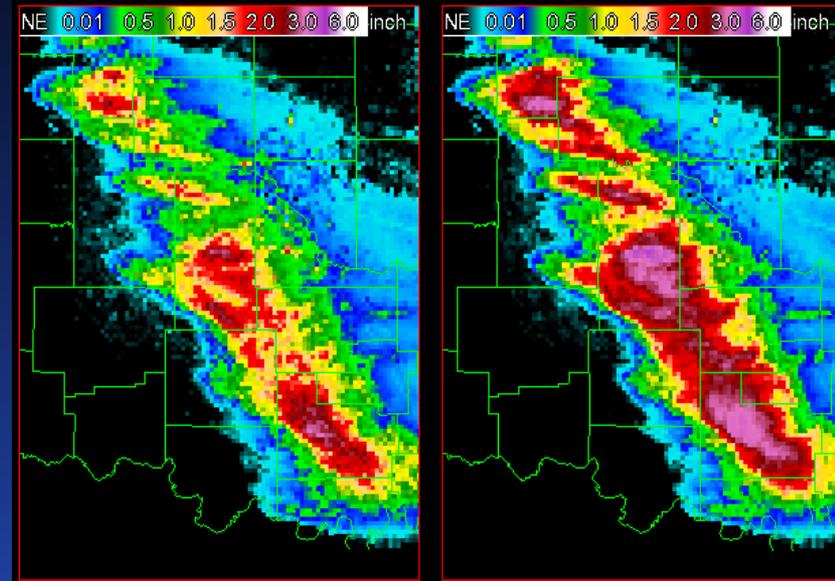




Dual-Polarization Doppler Radar

■ **Dual- Pol results demonstrate much improvement** (*NSSL documented reports*):

- ◆ **Finer imaging & better data for...**
- ◆ **rainfall estimation**
- ◆ **pinpointing tornadoes**
- ◆ **and much more...**

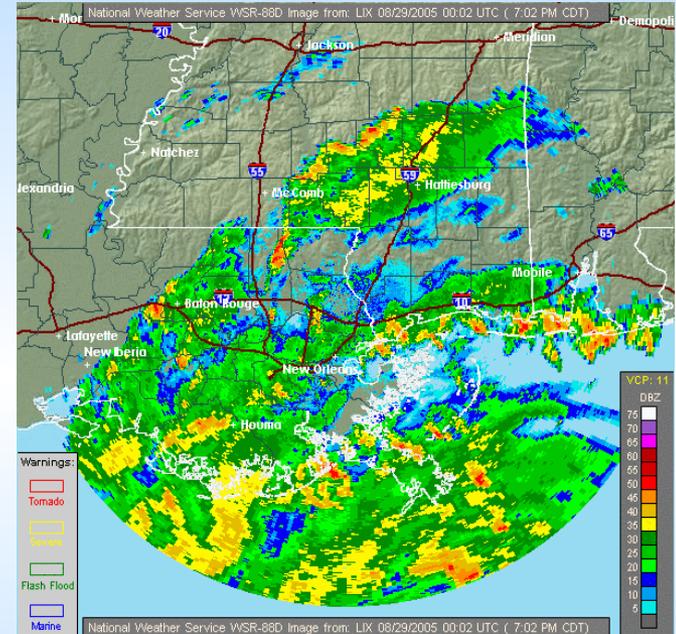


Dual-Pol WSR-88D 1-hr rainfall est. (left) vs. legacy WSR-88D estimate (right).

The right-hand image was a significant overestimate but the Dual-Pol product provided a much better estimate.

The NWS most sought after web product is your GIS-based NWS radar network...its there for EMs & public

- National Weather Service WFO GIS radar graphics include the latest **watches and storm-based warning boxes** right on the radar loops.
- The NWS GIS radar gives you the distance and direction of approaching weather to any geographic point of interest to you.
- Our data gives you a running tally of **local rainfall amounts**.
- You can superimpose our radar data unto your own GIS EM awareness and response program.



Example of NWS radar & warnings in Google Earth

www.SRH.weather.gov



Graphiccasts !



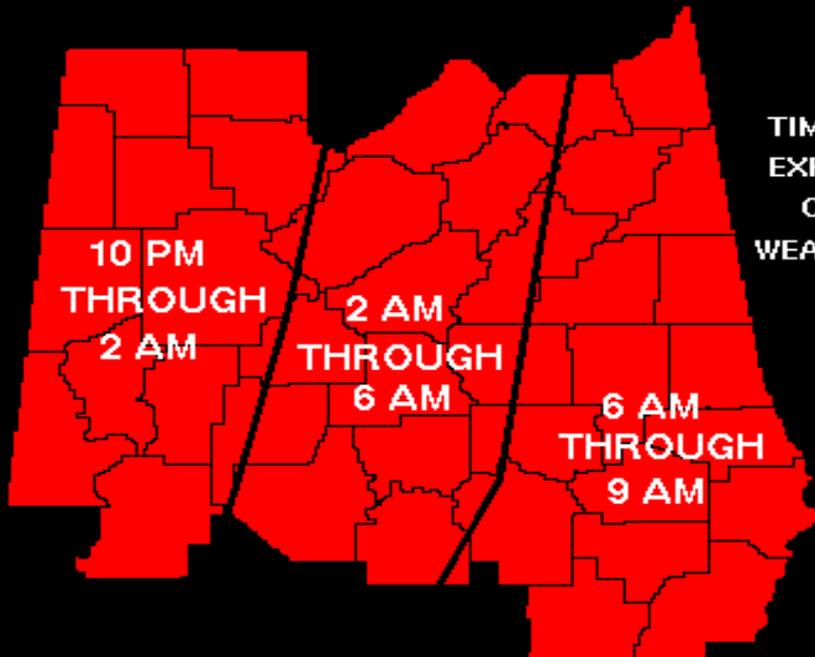
- **NWS Weather Forecast Office, River Forecast Center and Regional Office internet graphical/podcast hazard depictions of hydro-meteorological events.**
- **Partner/user valued internet enhancements that better depict the timing of hazards/threats into affected areas.**
- **Illustrating air, land & sea severe weather**

Graphiccast Example

HAZARDOUS WEATHER OUTLOOK
DAY ONE MAP
ISSUED: 12:24 PM MON MAR 03 2008
EXPIRES: 6:30 AM TUESDAY

POTENTIAL THREAT

High Fire Danger
Tornadoes
Severe Tstms
Strong Tstms
Winter Weather
Flooding
Heat/Cold
High Wind
Dense Fog
No Hazardous Weather



TIMES INDICATE EXPECTED PEAK OF SEVERE WEATHER THREAT

Timmy the Twister
says
Moderate Risk of Severe Weather

DAYS TWO THROUGH SEVEN

Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2 EARLY			1		

CONFIDENCE LEVEL:

1 2 3 4 5
Lo ---> Hi

The way ahead for our Nation!

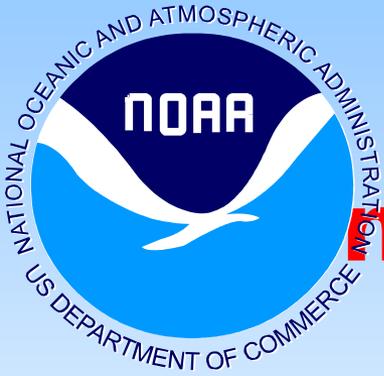
Requires successful budget planning and approval

An engaged EM community with their state and national associations (e.g. IAEM) working together to...

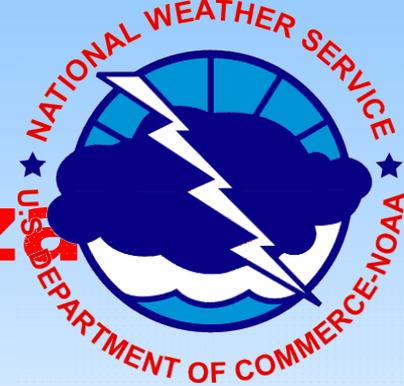
communicate a vital need for NWS' high-impact decision-support and its renewed infusion of science and technology

Only in this manner will the EM community have their weather information needs met but also g





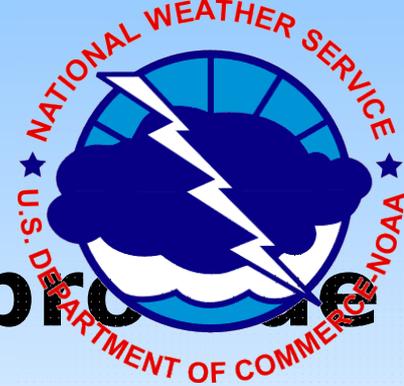
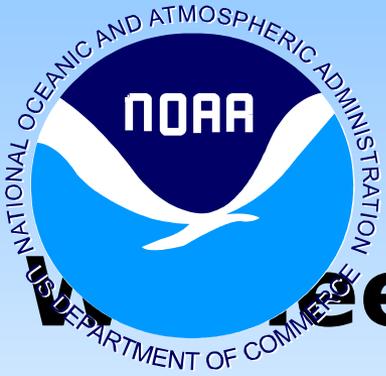
More Resilient All-Hazard Homeland.



We all know there is no higher calling than the protection of life and we need to do that to the best of our ability.

There are 180 field/regional NWS offices working with you, our EM/media partners to epitomize the concept:

**...government closest to the people,
service best**



Need your help to **best** provide
you decision-support
***“A nation committed to decision
support
as an investment today...
will save countless lives in
the future !”***

Bill Proenza, Regional Director
National Weather Service, Southern Region