



National Weather Service

Performance and Challenges

Warning Systems

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New Orleans

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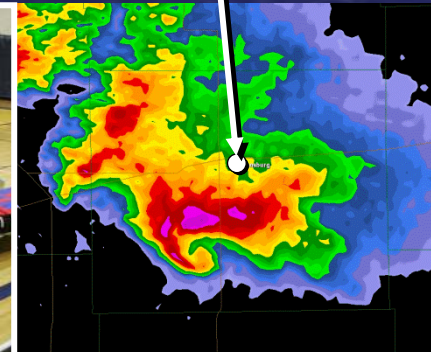
Busy 2008

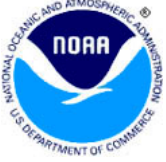


	2008	2007	2006	2005
Number of Tornadoes	1296*	1074	1106	1264
Number of Tornado Fatalities	123*	81	67	38

**Preliminary So Far This Year*

Greensburg, KS



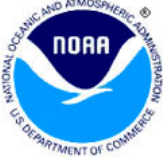


Super Tuesday



- February 5 through 6, 2008:

82 tornadoes including 5 EF4s
57 fatalities; most since May 31st, 1985 and 13th
all time
350+ injuries
> 400M in property damage
36 (63%) killed were in mobile homes
Most of the tornadoes occurred after dark



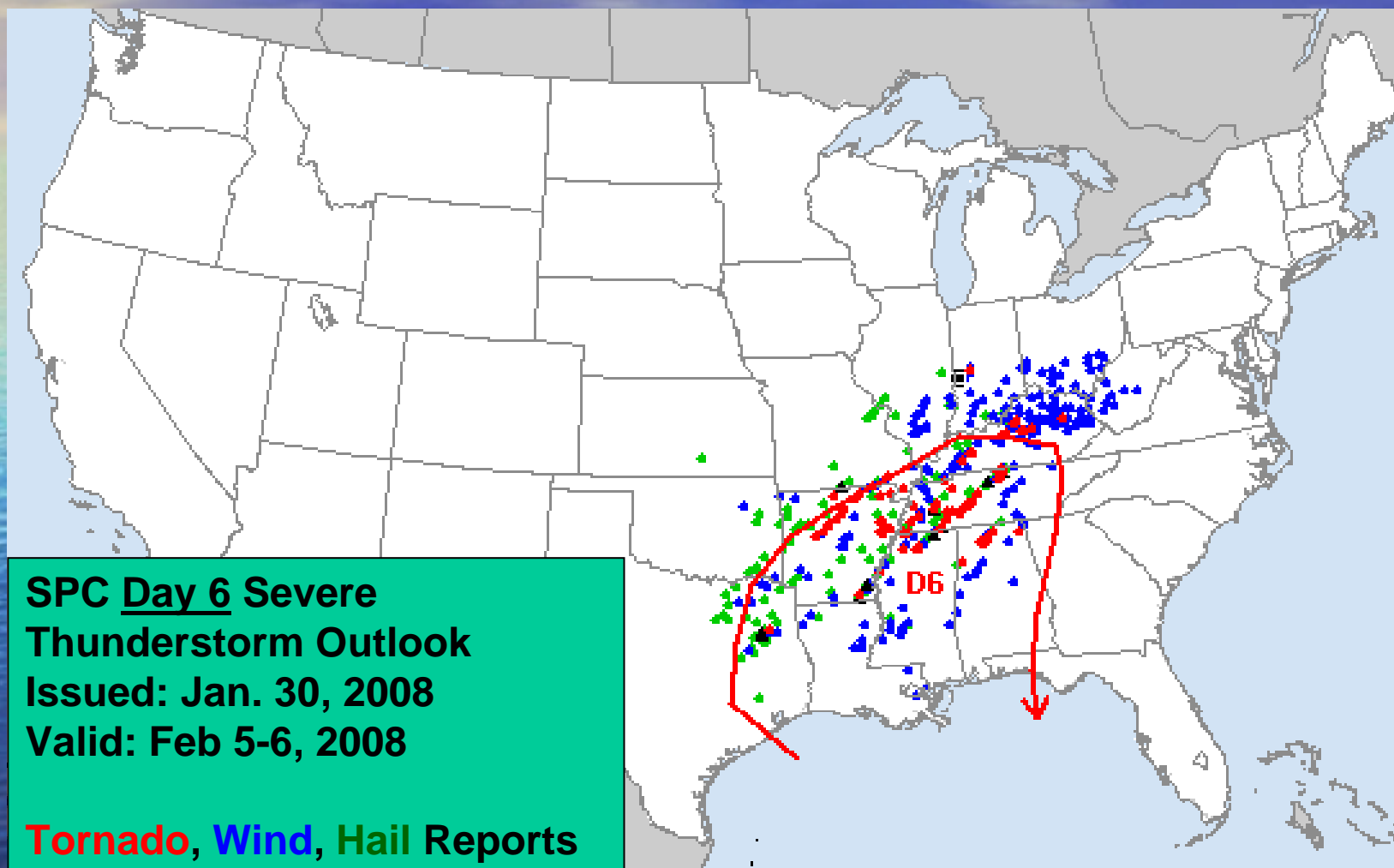
Super Tuesday



Even with advanced notice of the event and individual severe storms, there was still a large loss of life



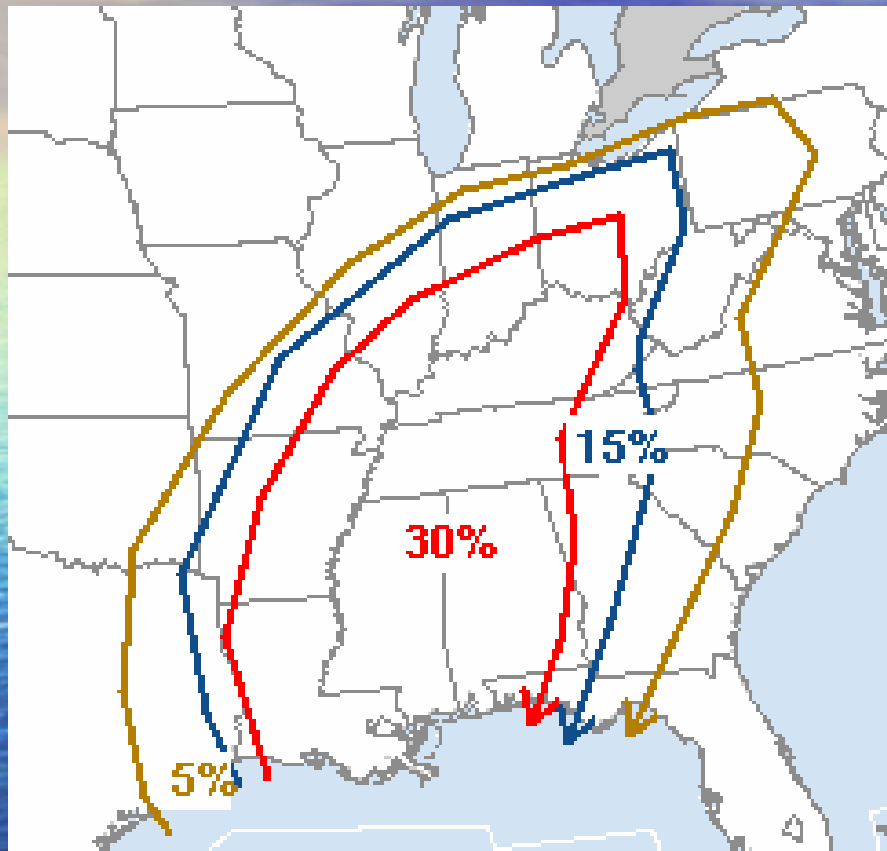
Communication Prior to Outbreak



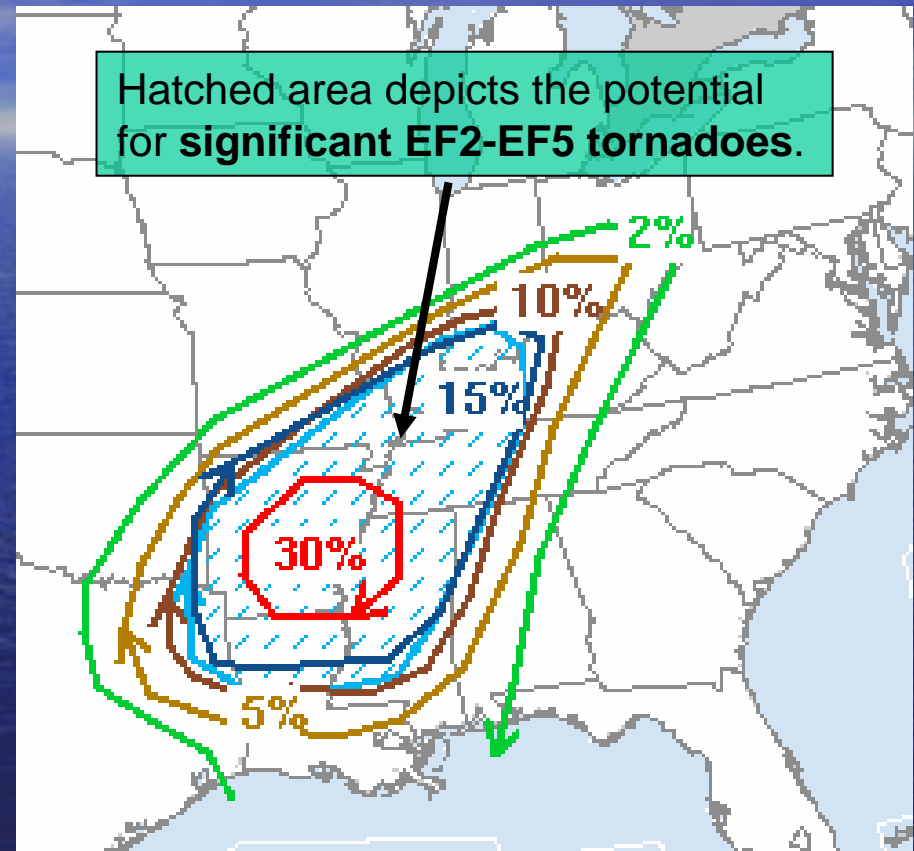
NWS began publicizing the potential for severe weather 6 days in advance of the outbreak.



Communication Prior to Outbreak



Day 3 Severe Thunderstorm Outlook
Issued: Sun (2am), Feb 3. Valid: Feb 5-6



Day 1 Tornado Probability
Issued and Valid Tue, Feb 5

NWS forecasts were further refined leading up to February 5, 2008



Communication Prior to Outbreak



- **NWS Weather Forecast Offices (WFOs) advertised the potential for severe thunderstorms, including tornadoes, in their Hazardous Weather Outlooks (HWOs) as early as Thursday, January 31, 2008.**
 - Subsequent HWOs throughout the weekend refined the timing and magnitude of the threat.
- **WFOs used conference calls, Go-To Meeting, email/text alerts, and graphical HWOs to provide situational awareness.**
- **WFOs used IEM Chat and 800MHz to communicate with media and emergency manager partners.**



Warning Lead Time

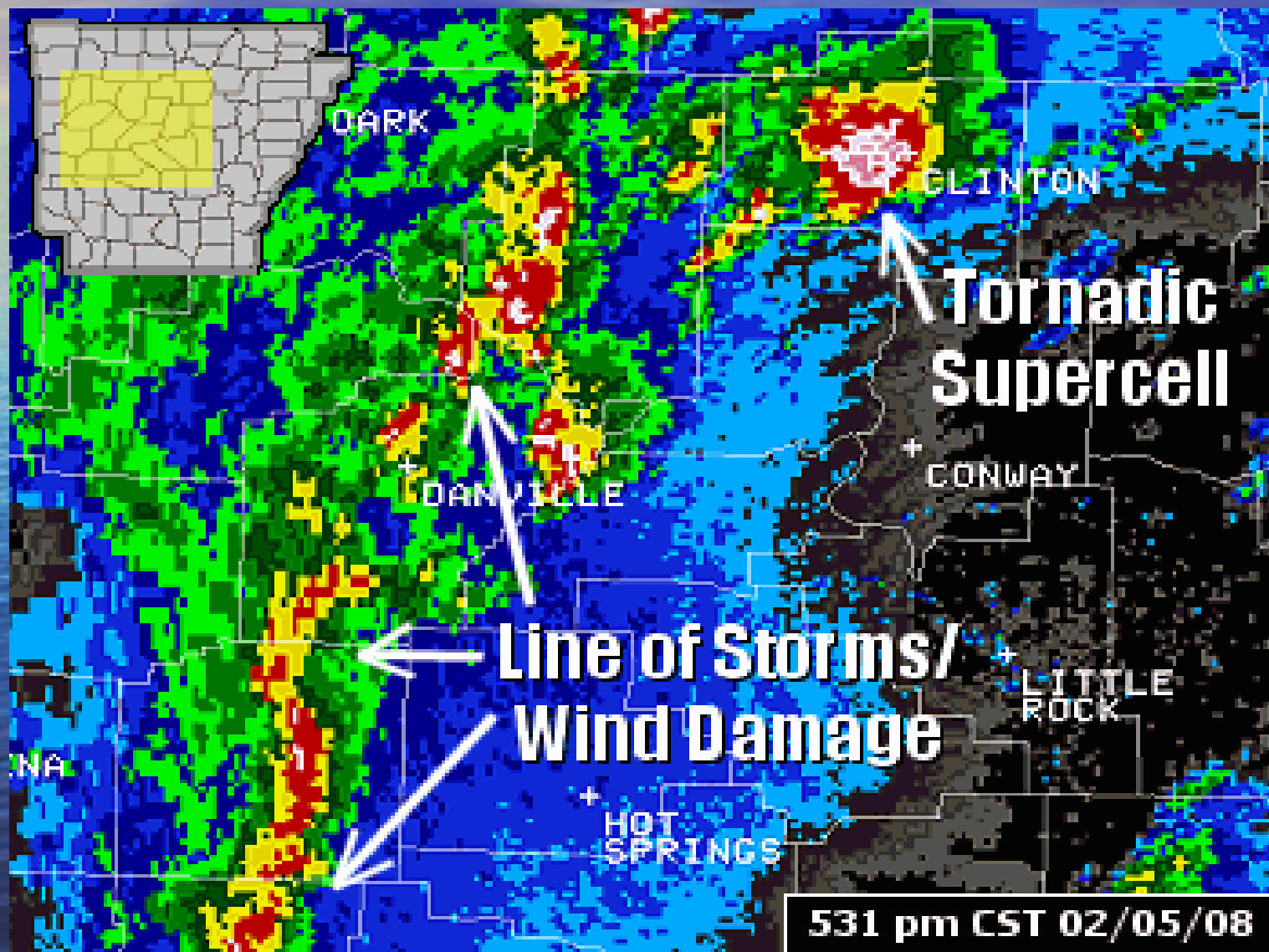
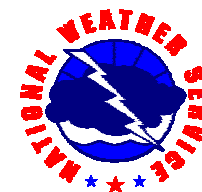


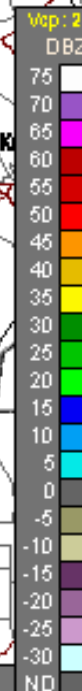
- **Performance:**

- Average lead time for tornado warnings was 18 minutes (17 minutes for tornadoes causing fatalities)



What Happened?





Warnings:

Tornado

Severe Thunderstorm

Flash Flood

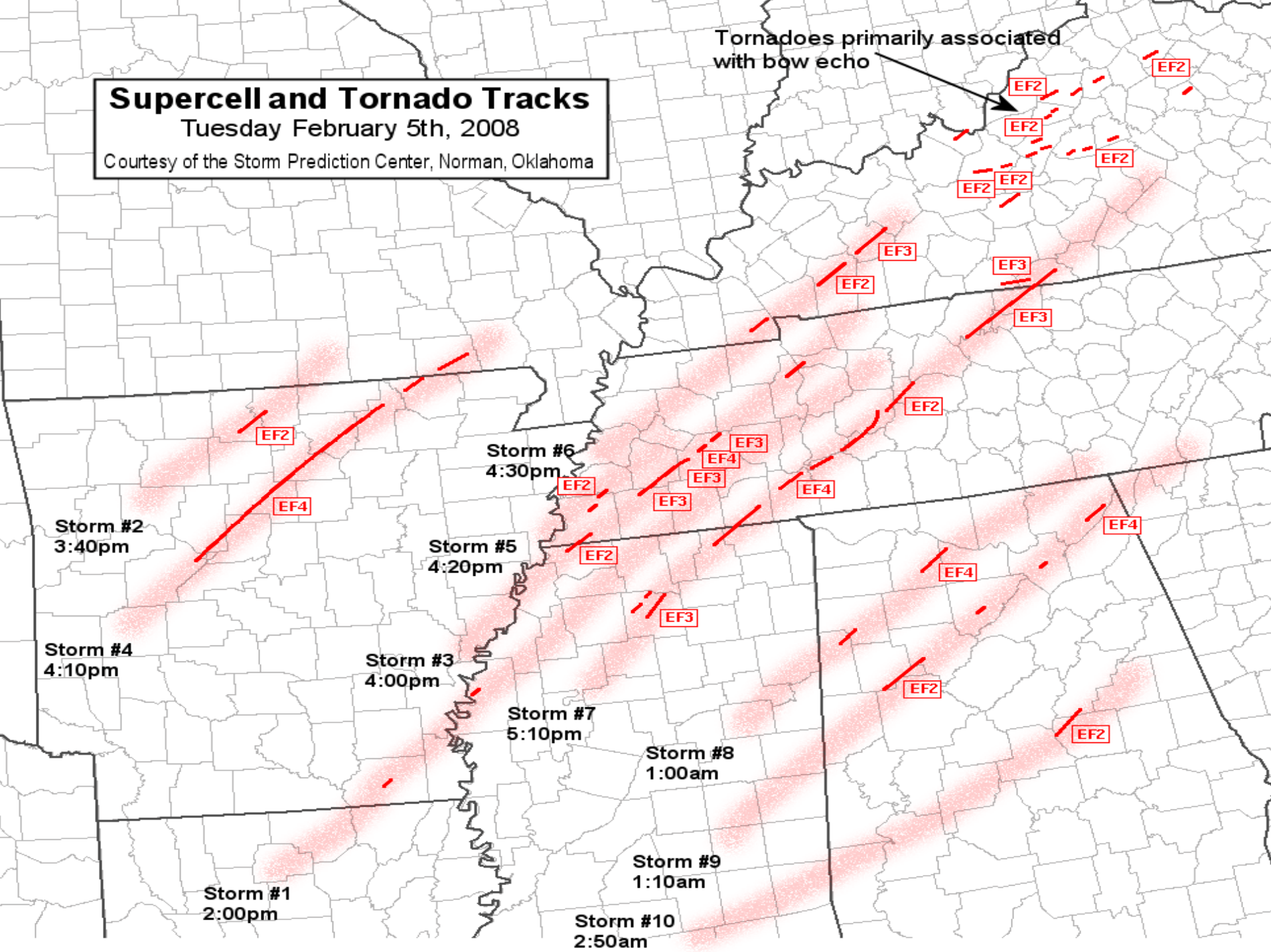
Special Marine

Supercell and Tornado Tracks

Tuesday February 5th, 2008

Courtesy of the Storm Prediction Center, Norman, Oklahoma

Tornadoes primarily associated with bow echo



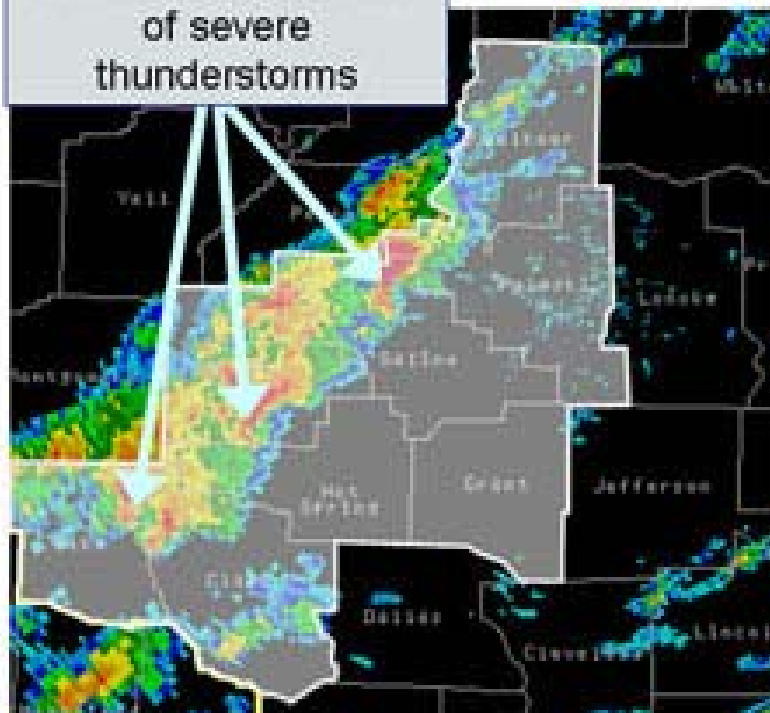


Storm Based Warnings



Three simultaneous
tornadoes within line
of severe
thunderstorms

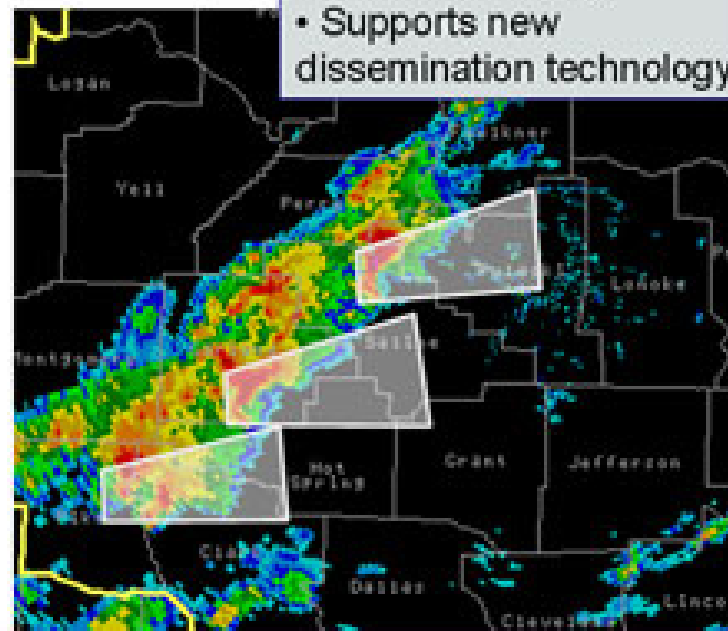
Previously



County-Based Tornado Warnings
8 Counties under warning
Almost 1 million people warned

October 1, 2007

- More specific
- Increased clarity
- Supports new dissemination technology



Storm-Based Tornado Warnings
70% less area covered
~600,000 fewer people warned



Hurricane Season 2008



Tropical Storm Arthur
Hurricane Bertha
Tropical Storm Cristobal
Hurricane Dolly
Tropical Storm Edouard
Tropical Storm Fay
Hurricane Gustav
Hurricane Hanna
Hurricane Ike
Tropical Storm Josephine



Storm Surge



Bay St. Louis, MS





Communicating Impacts



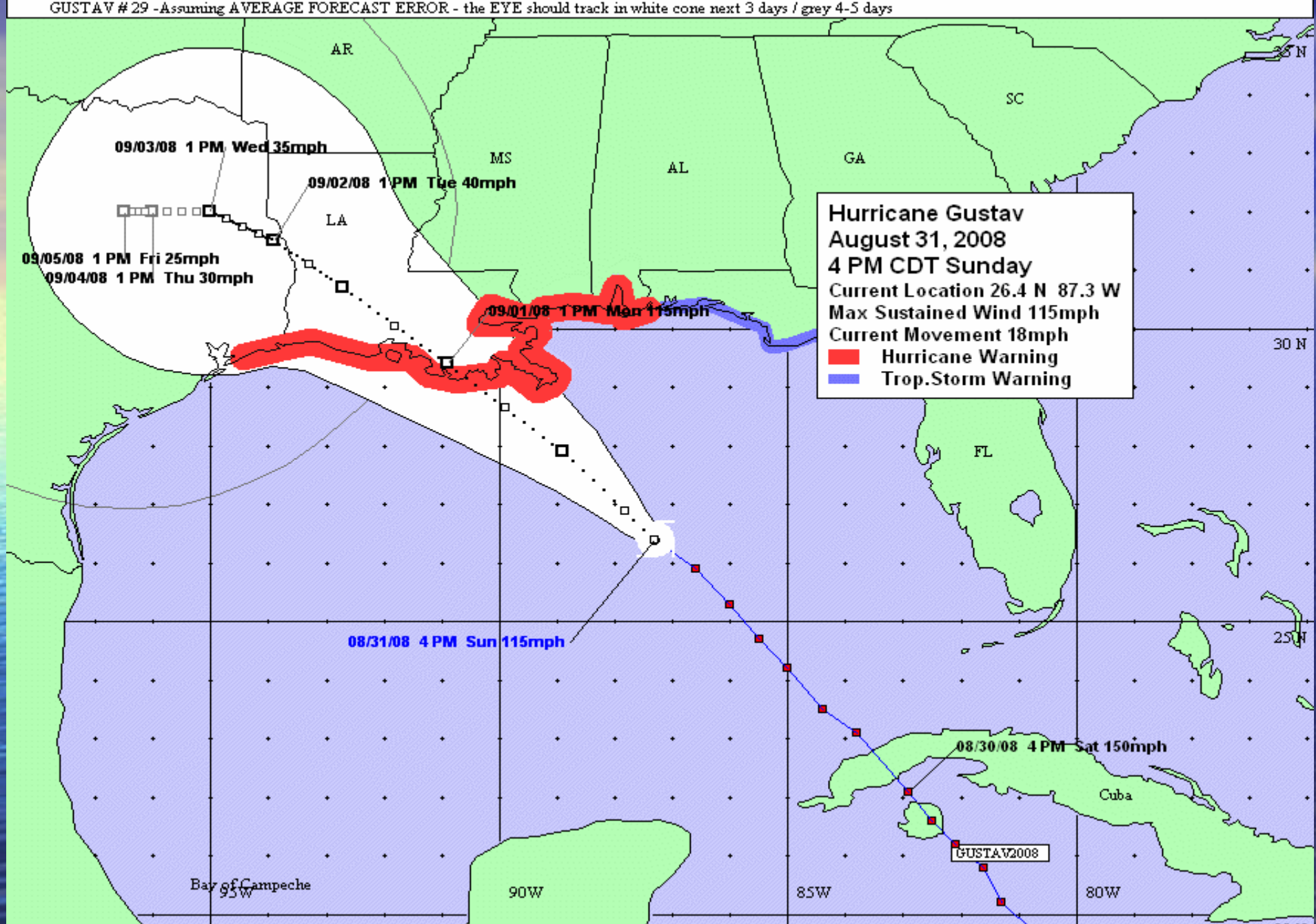
Routine	Becomes	Extreme
Text Products		Impact Statements
Graphical Products		Live Go-To Meetings
Statements		Briefings
Discussions		Press Conference
Stand-Alone		Stand-By
Daily Forecast		Life or Death



Communicating Impacts



The following slides are the actual
slides used during a situational
awareness presentation



>34Kt(39mph)

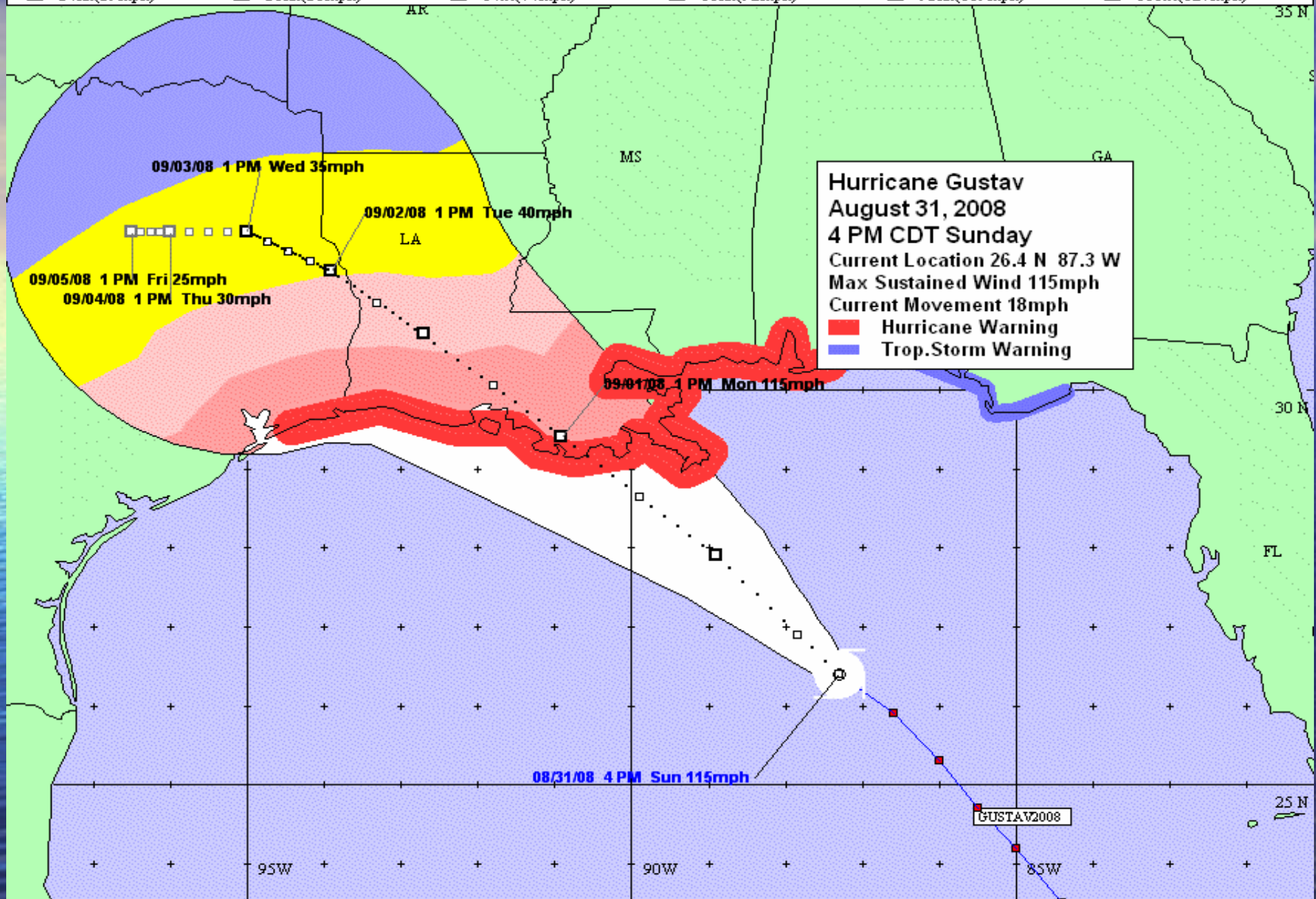
>50Kt(58mph)

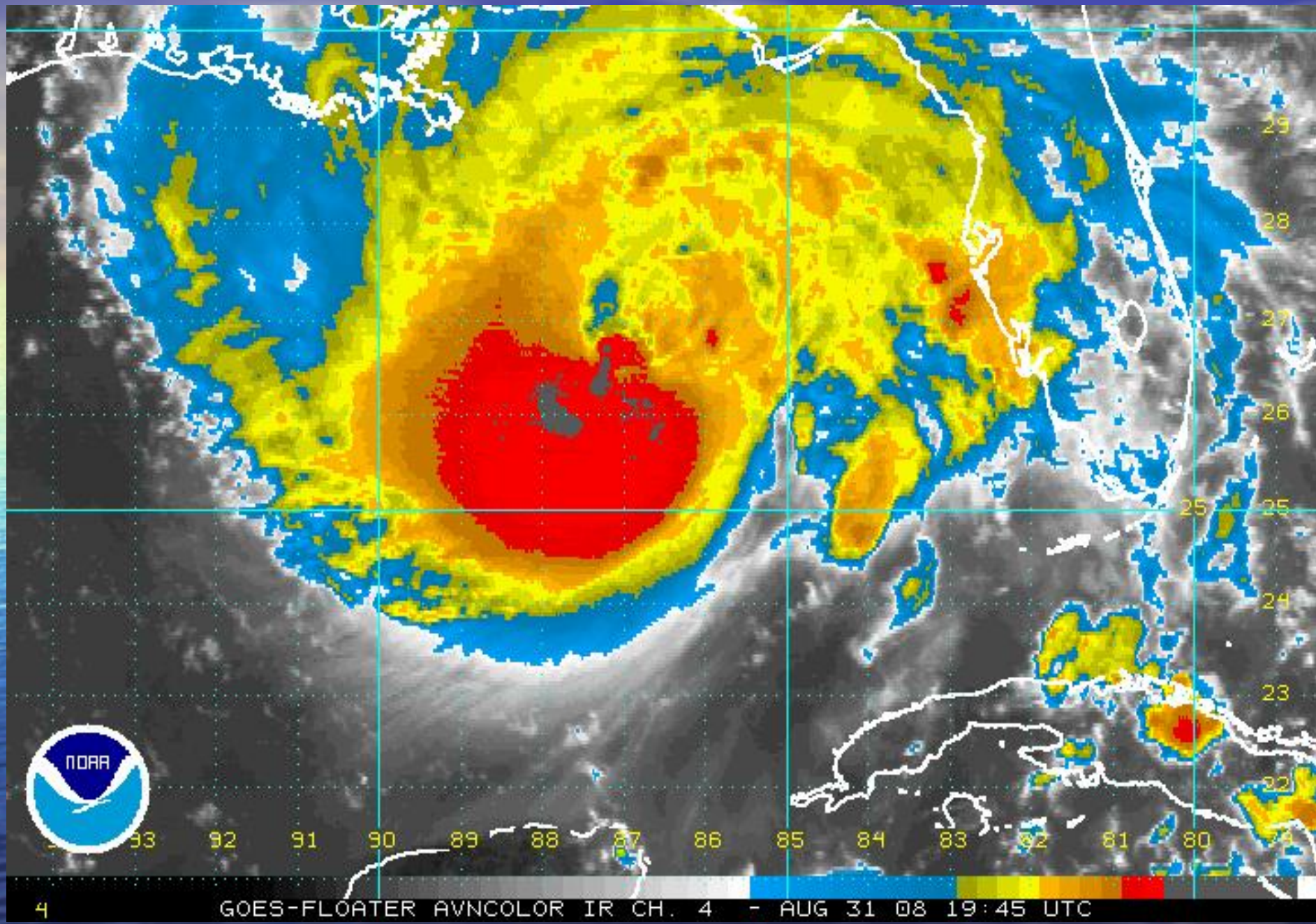
>64kt(74mph)

>80Kt(92mph)

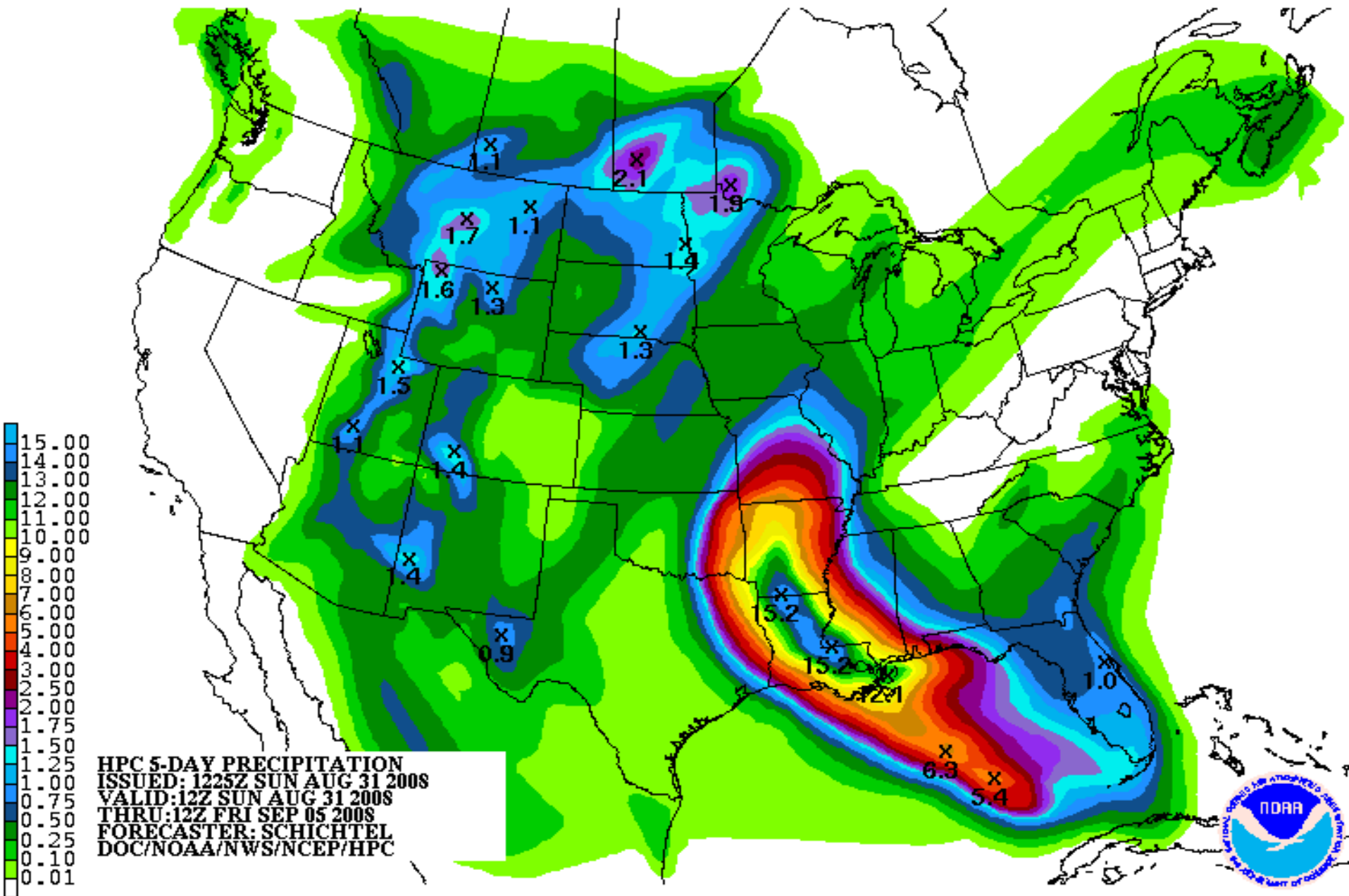
>95Kt(109mph)

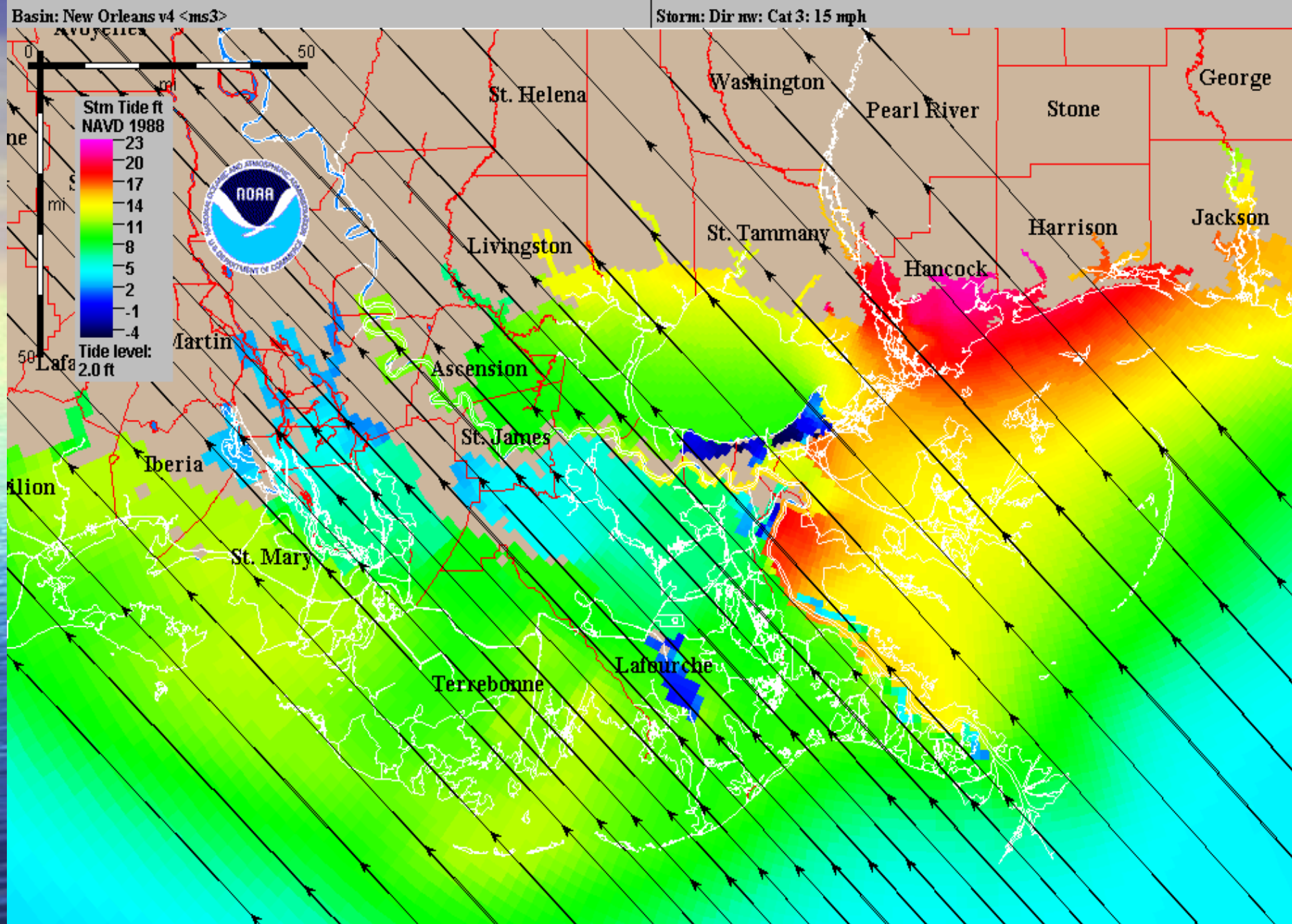
>110kt(127mph)





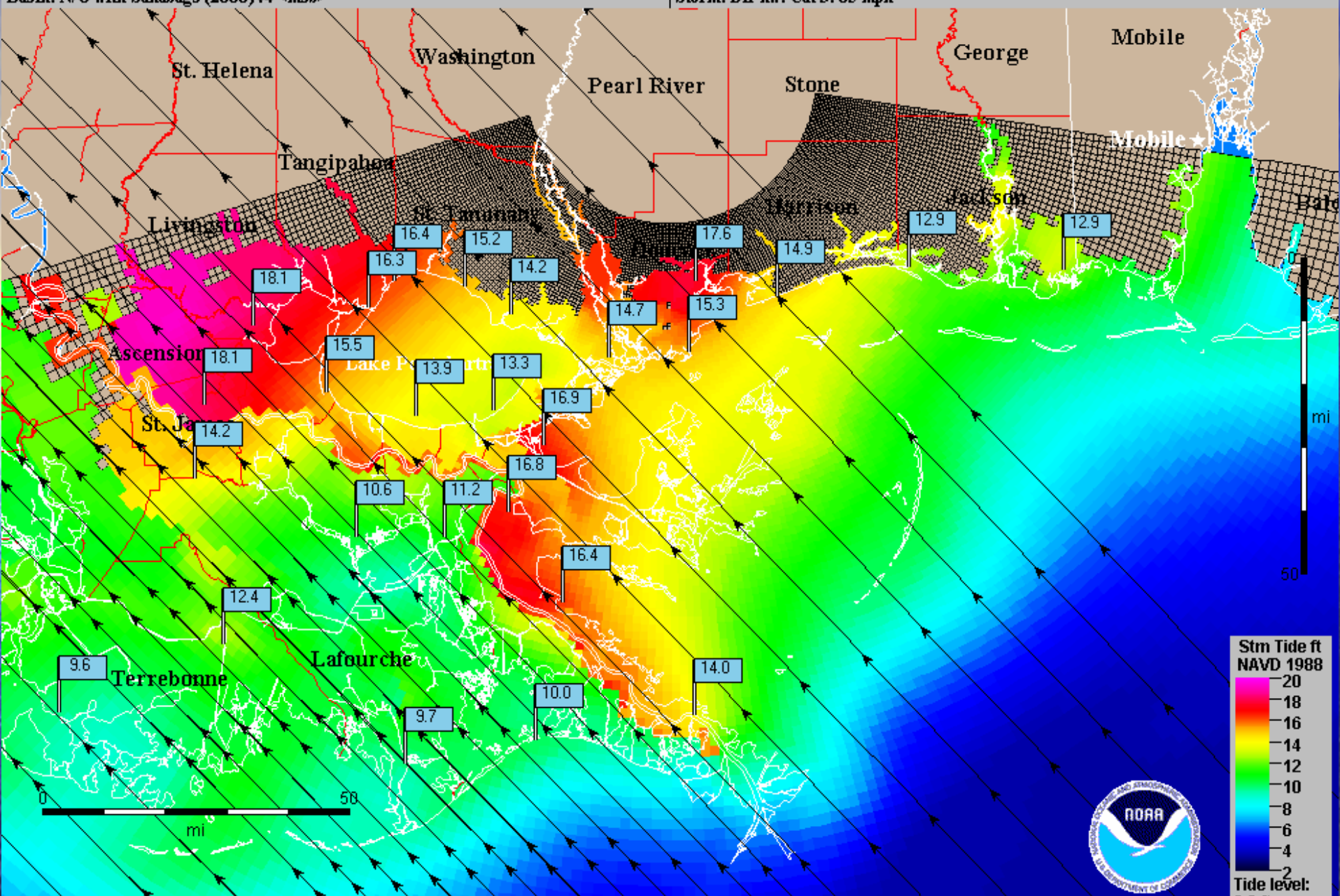
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Basin: N/O with Sandbags (2008)v4 <msh>

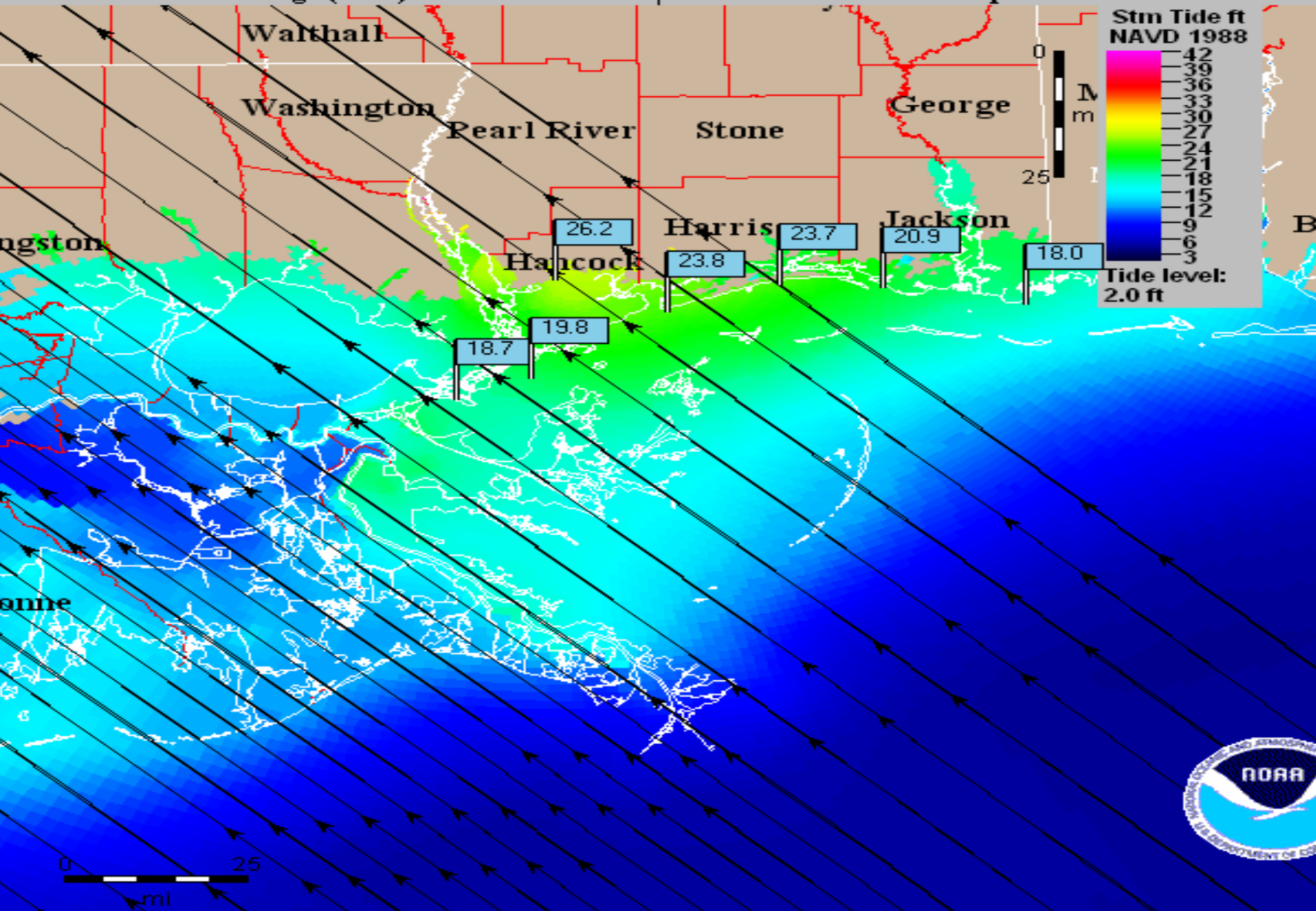
Storm: Dir nw: Cat 3: 05 mph



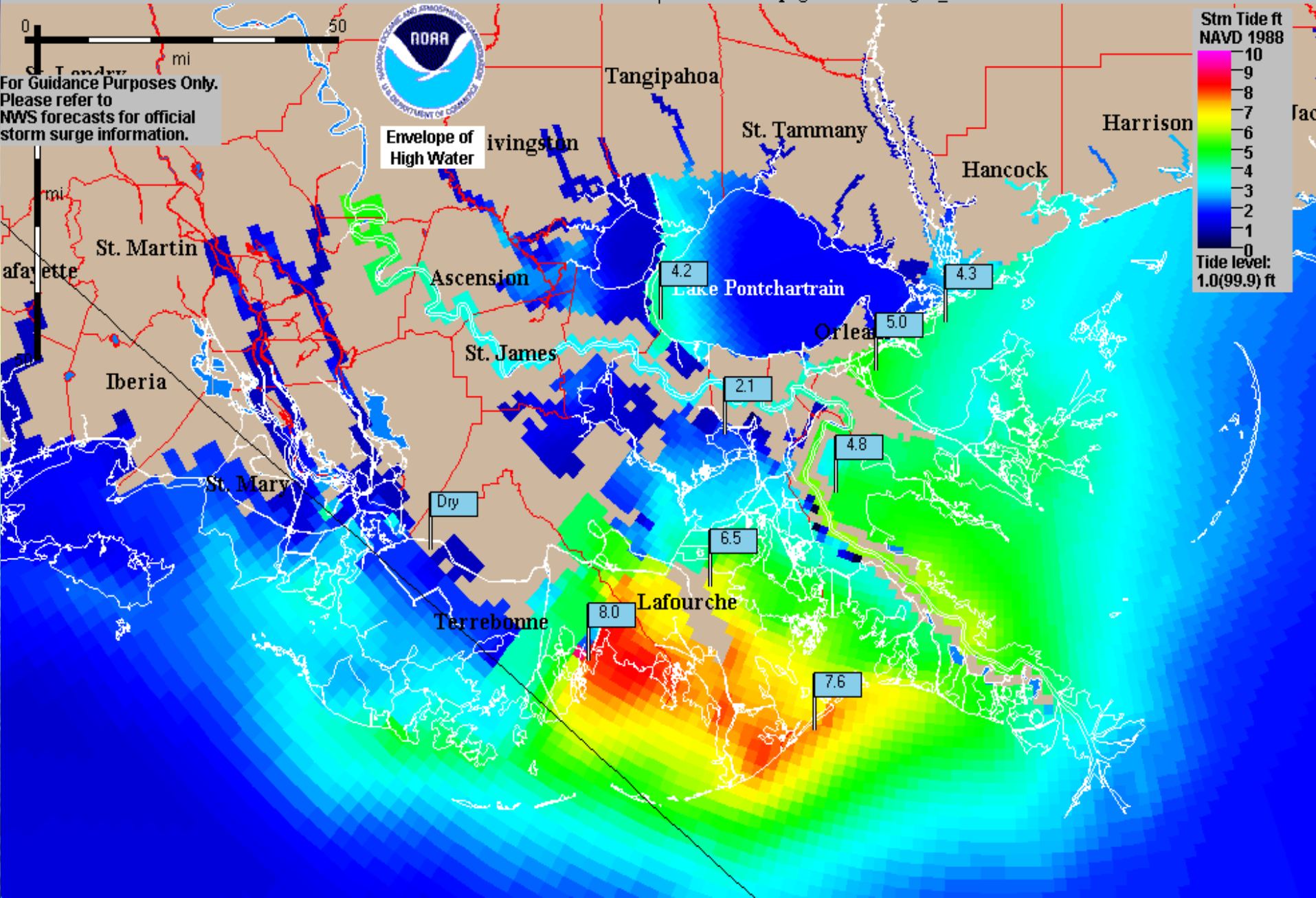
WEATHER.GOV

Basin: N/O with Sandbags (2008) v4 <msb>

Storm: Dir nw: Cat 4: 15 mph

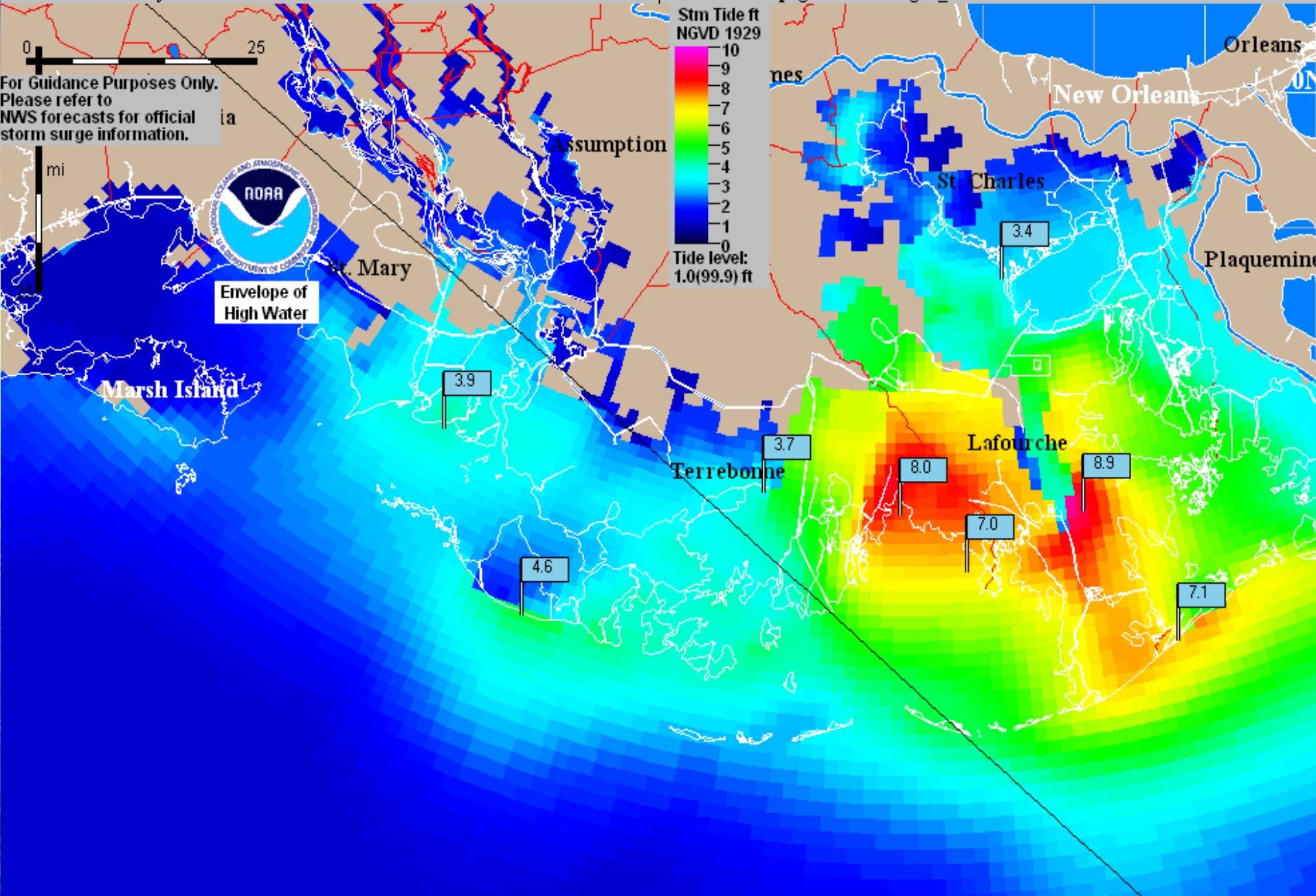


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Basin: Vermilion Bay <1ft>

Storm: c:/slosh/pkg/data/rexfiles/g29_lft.rex



Gustav SLOSH estimate using 50 nm RMW

Basin: New Orleans v4 <msb>

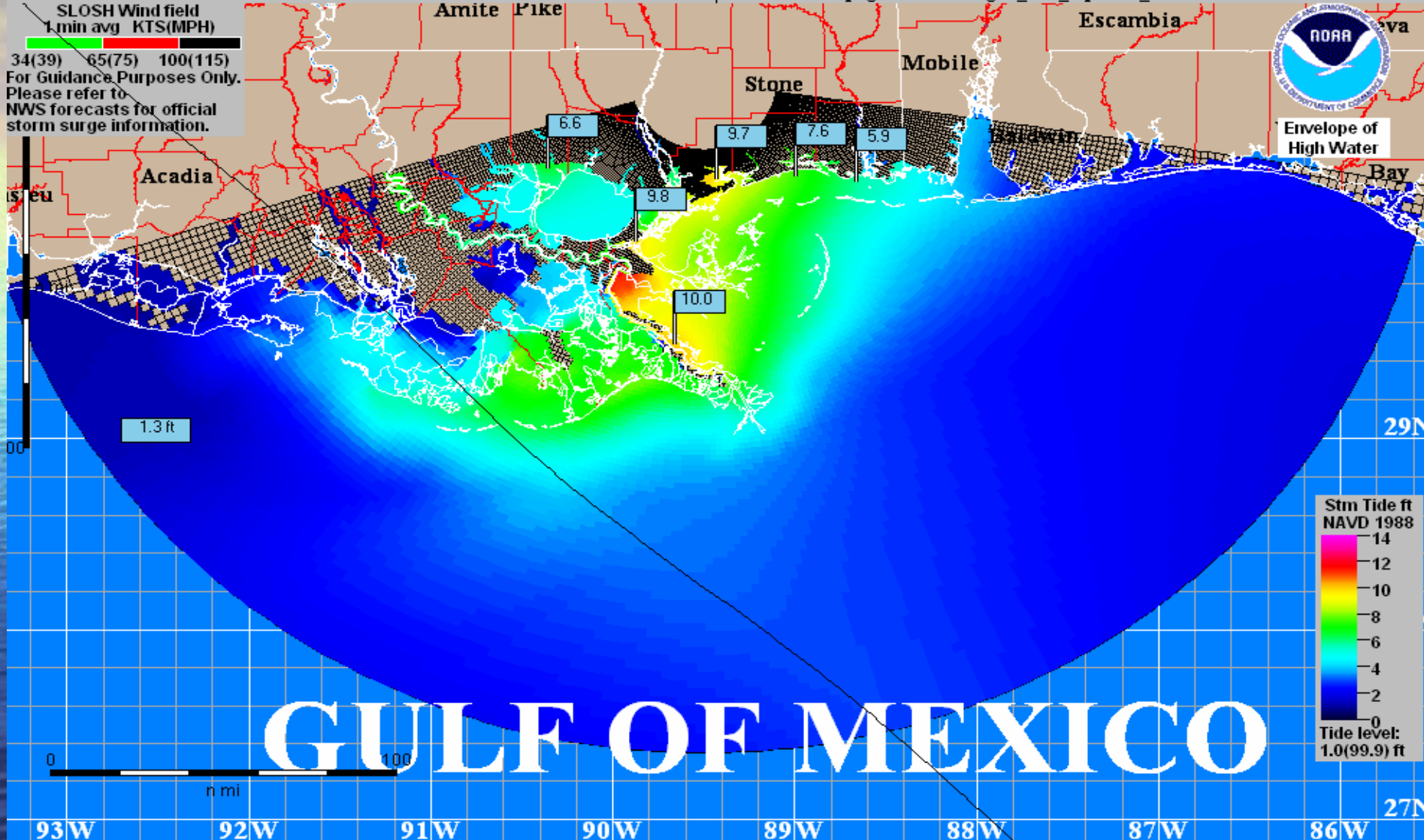
SLOSH Wind field
1 min avg KTS(MPH)

34(39) 65(75) 100(115)
For Guidance Purposes Only.
Please refer to
NWS forecasts for official
storm surge information.

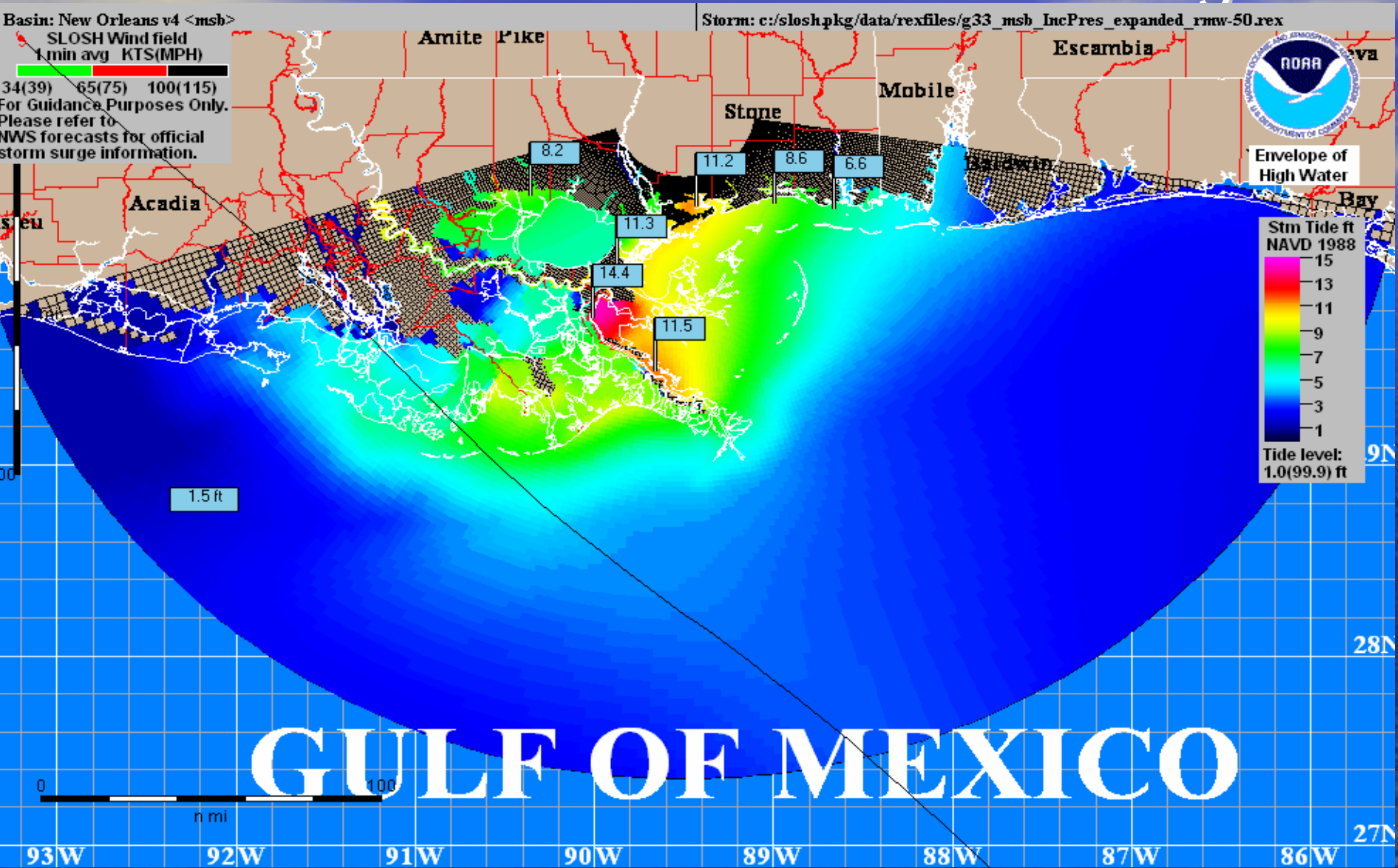
Storm: c:/slosh/pkg/data/rexfiles/g33_msb_expanded_rmw-50.rex



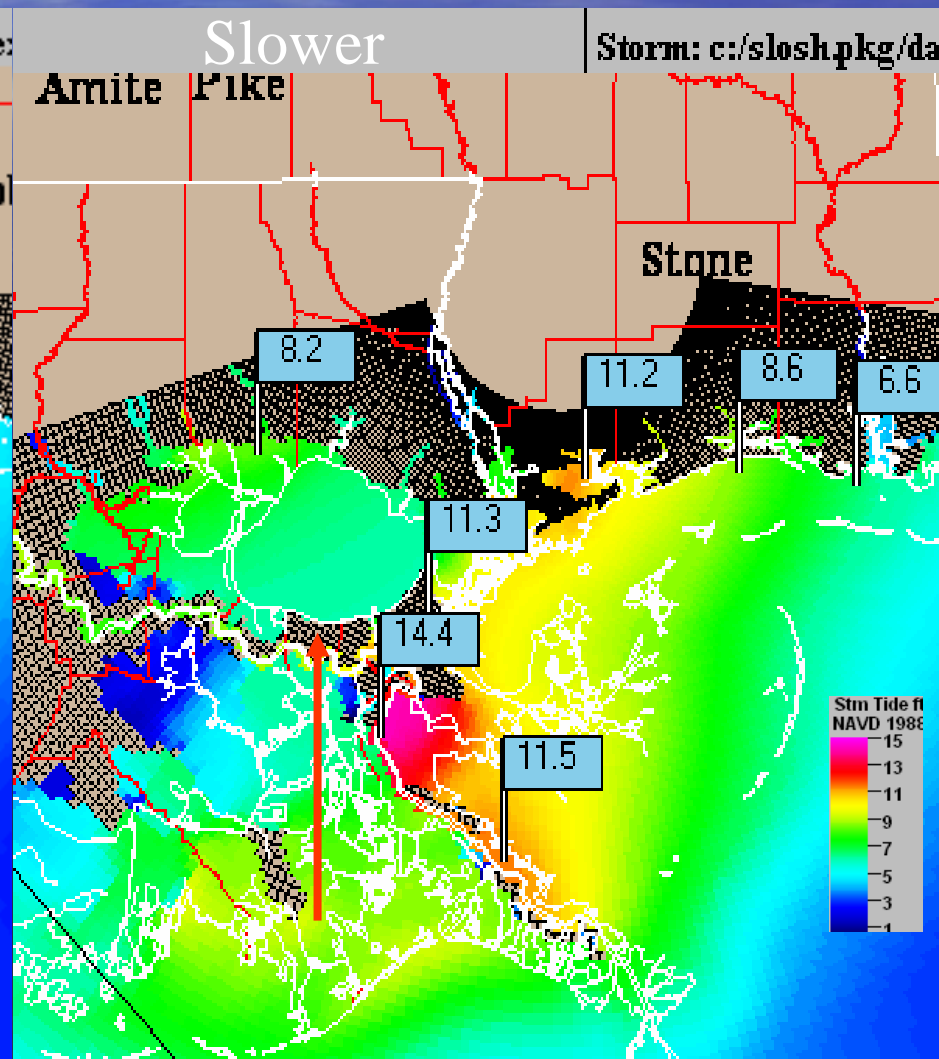
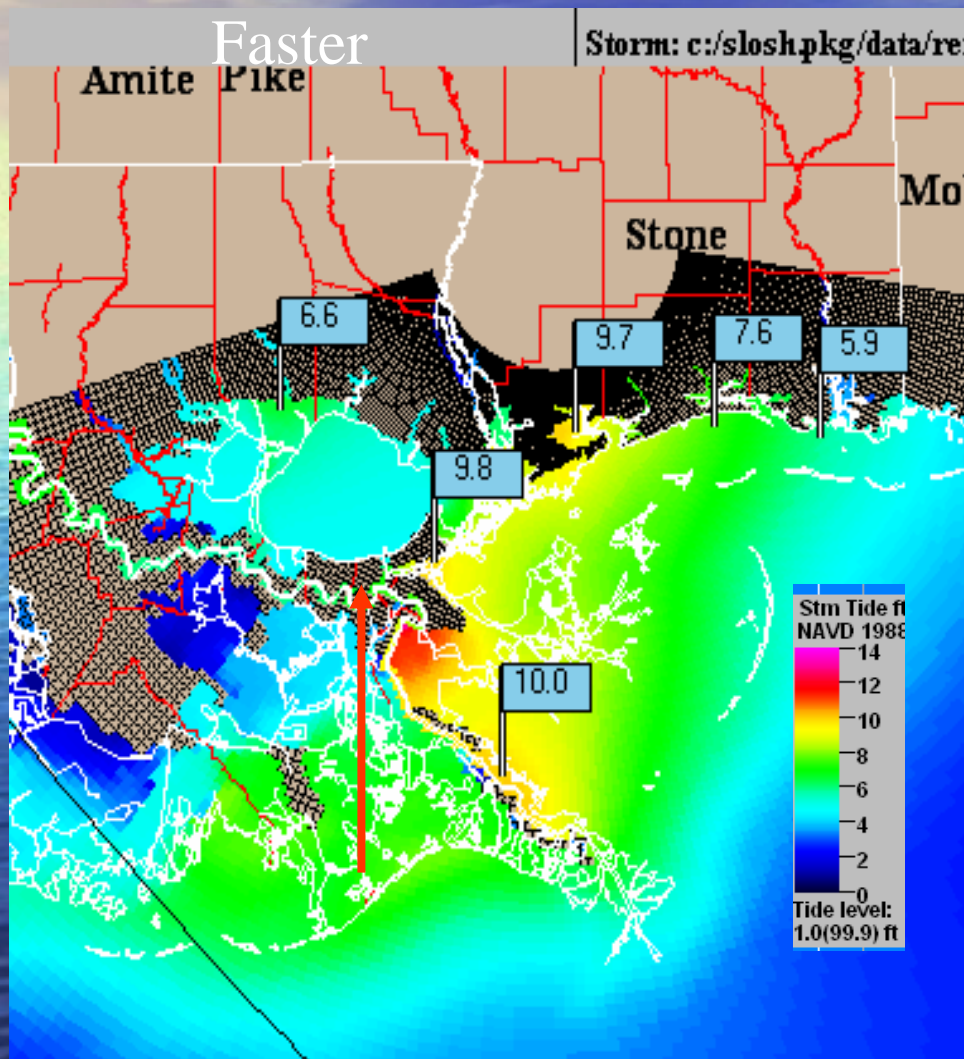
Envelope of
High Water



Gustav estimate if ~ 10 knots stronger



Note that only 10 knots makes the difference between west bank communities dry or wet

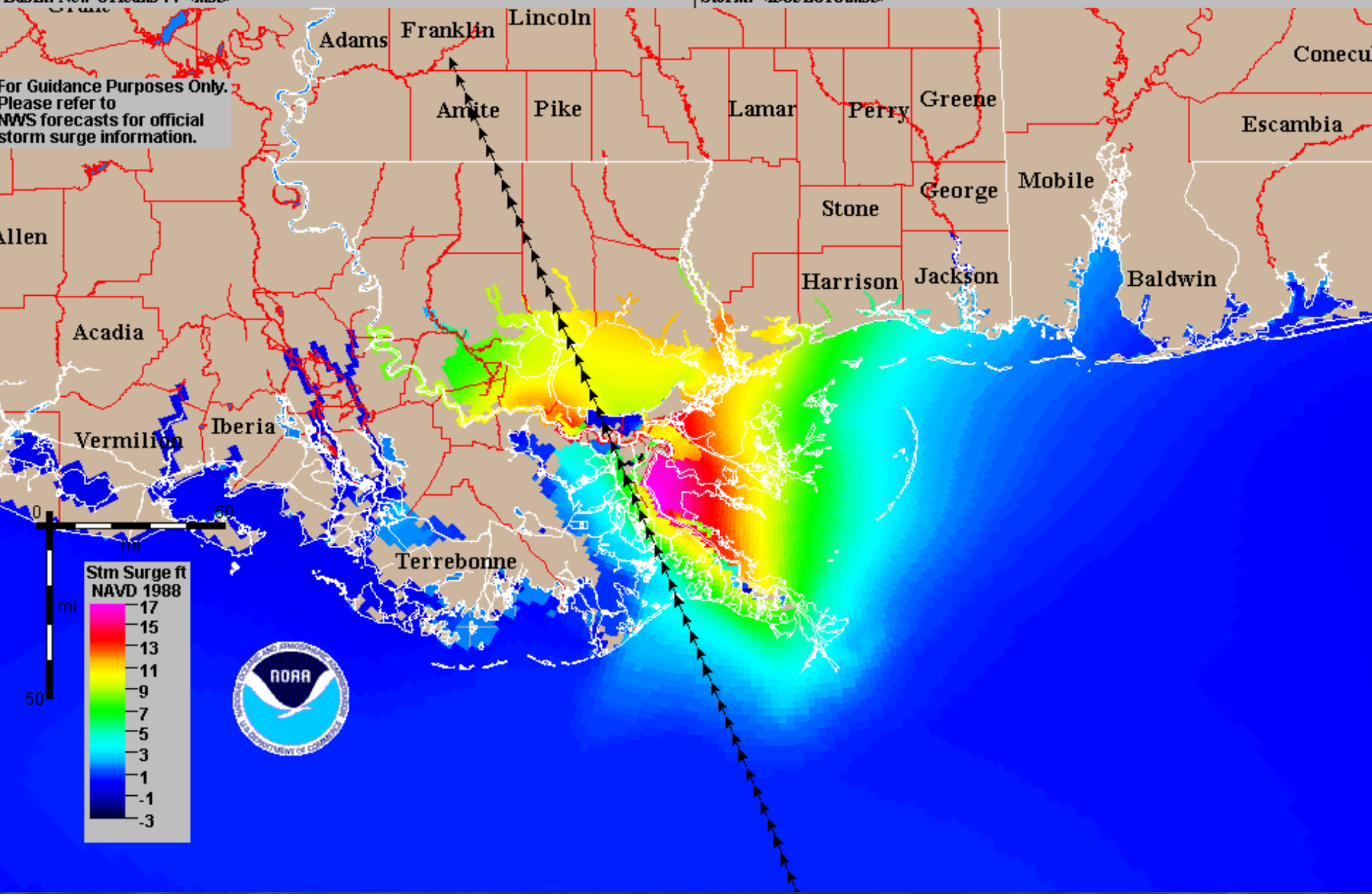


Single Track Storm Surge Plot

Basin: New Orleans v4 <ms3>

Storm: <f305L010.ms3>

For Guidance Purposes Only.
Please refer to
NWS forecasts for official
storm surge information.

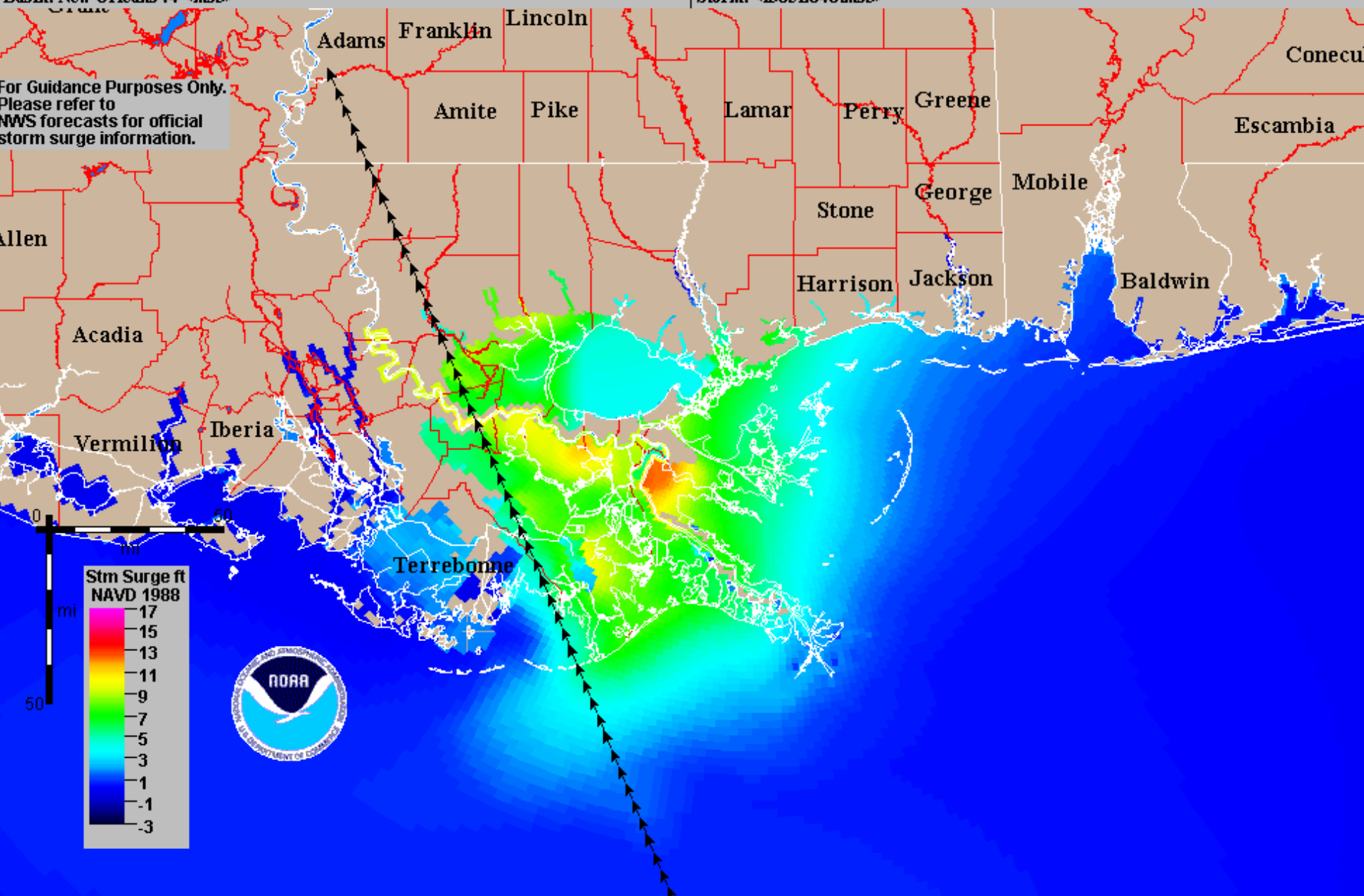


Single Track Storm Surge Plot (moved track west)

Basin: New Orleans v4 <ms3>

Storm: <f305L040.ms3>

For Guidance Purposes Only.
Please refer to
NWS forecasts for official
storm surge information.

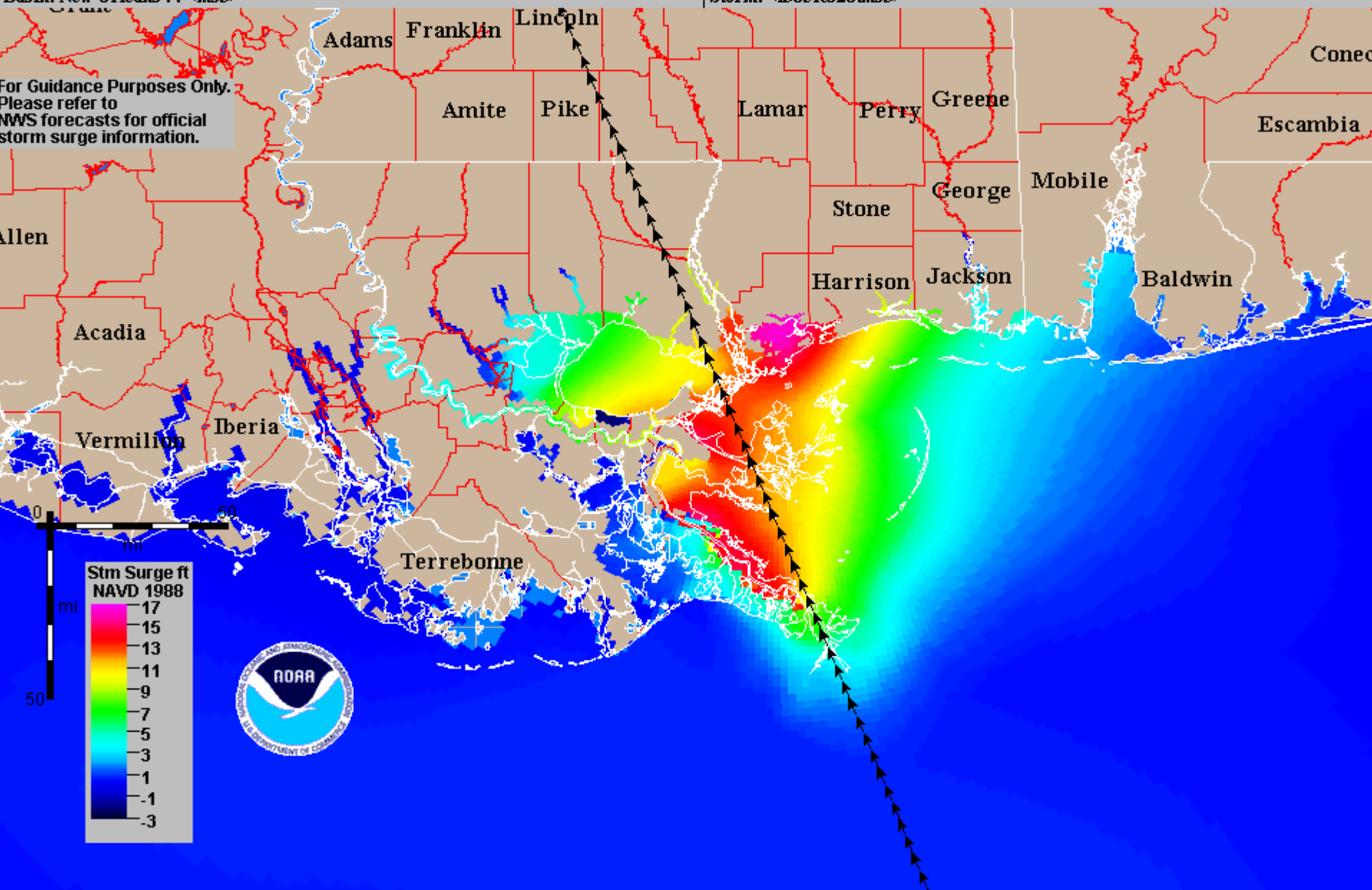


Single Track Storm Surge Plot (moved track east)

Basin: New Orleans v4 <ms3>

Storm: <f305R020.ms3>

For Guidance Purposes Only.
Please refer to
NWS forecasts for official
storm surge information.



[illegible]

Multiple Track Storm Surge Plot

Basin: New Orleans v4 <ms3>

Storm: Dir now: Cat 3: 05 mph

Winn

Jefferson

Franklin

Amite

Copiah

Simpson

Smith

Jasper

Clarke

Wilcox

Butler

Jones

Wayne

Greene

Escambia

Conecuh

Baldwin

Mobile

George

Stone

Jackson

Walton

Acadia

Vermilion

NOAA

Stm Tide ft NAVD 1988

18

16

14

12

10

8

6

4

2

Tide level: 2.0 ft

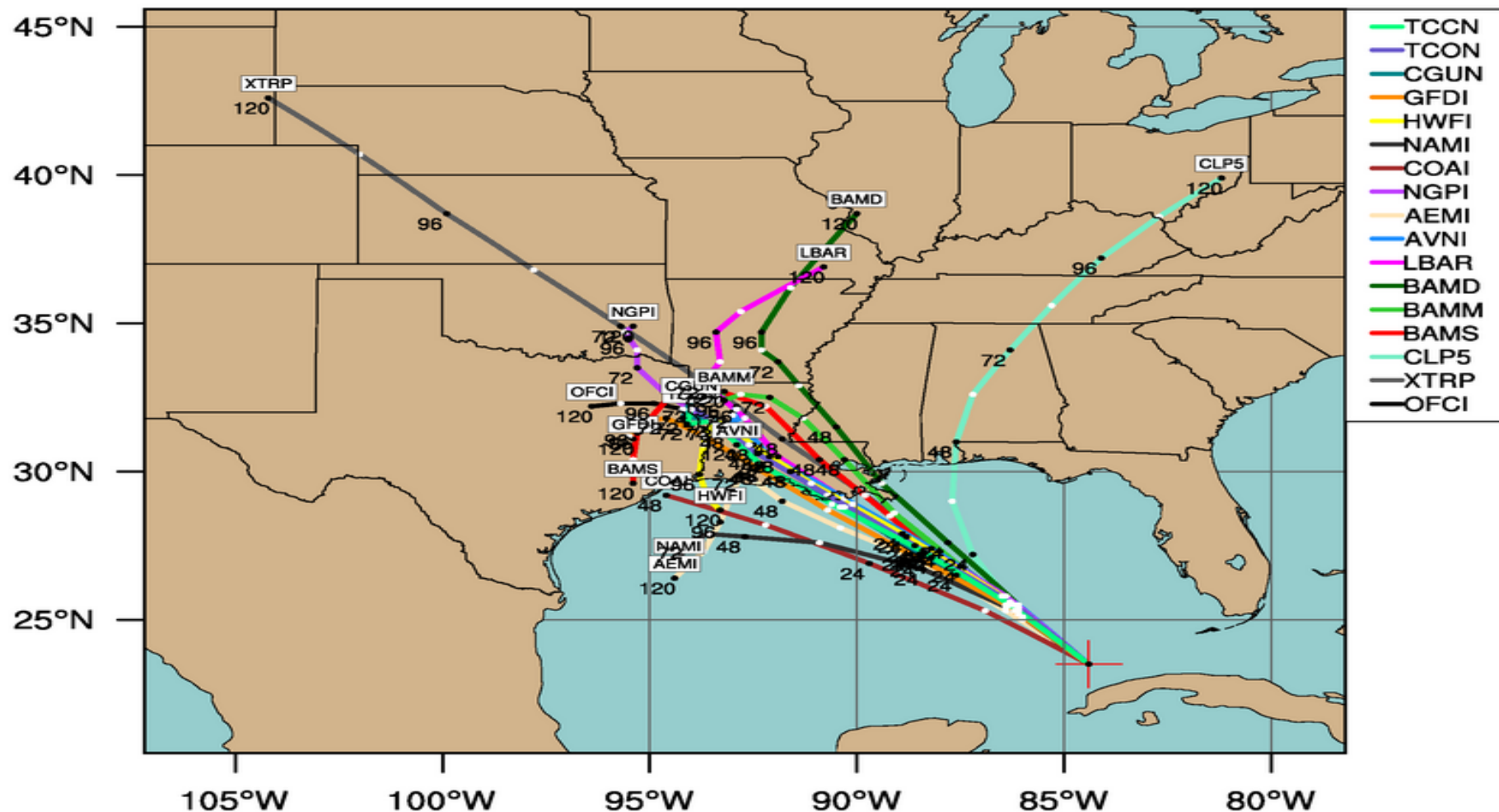
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MAJOR HURRICANE GUSTAV (AL07)

Early-cycle track guidance valid 0600 UTC, 31 August 2008

Current Intensity: 115 kt

Current Basin: North Atlantic



This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

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Communicating Impacts



Time	Event*
0300	Internal Coordination
0700	Governor Briefing
0800	SE Parish Task Force
0900	Internal Coordination
1000	New Orleans FEB
1100	MS Counties Briefing
1500	Internal Coordination
1600	SE Parish Task Force
1700	New Orleans FEB
1800	Governor Briefing

*Does not include briefings on demand, press conferences, or media interviews



Future Improvements



Improving Services for Future:

•Radar Advancements

- Super Resolution Doppler Radar
- Dual-Polarization Radars
- Phased Array Radar

•Warning Dissemination

- Common Alerting Protocol (CAP)
 - Cell Phone
 - Reverse 911
 - In Car Information
 - GIS

•Storm Decision Aids

- Uncertainty Communication



Future Improvements



Improving Services for Future:

- Hurricane Forecast Improvement Research
 - Intensity
 - Track
 - Storm Surge

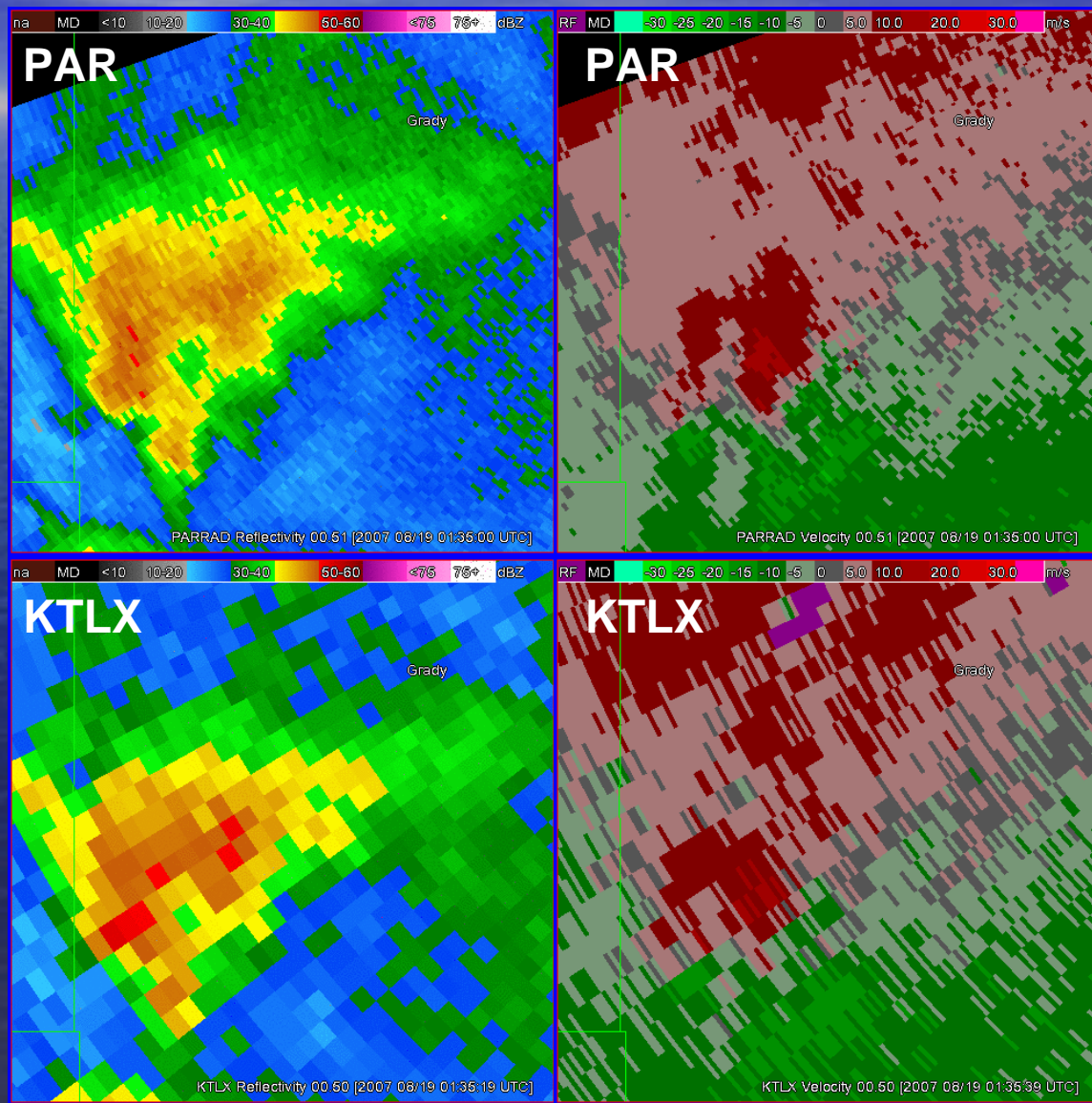


Future Improvements



Advancements In Radar
Technology

Phased Array
compared to
WSR-88D





Future Improvements



- **Improved Social Science Integration**
 - WAS*IS
 - Strong Emergency Management Ties
 - Target Those At Risk
- **Continue Strong Partnerships Related to NOAA Weather Radio**
 - Transmitters
 - Receivers
 - Weather Radio Improvement Project (WRIP)



Continue to Grow Our All Hazards Partnership...



...Incident Support





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