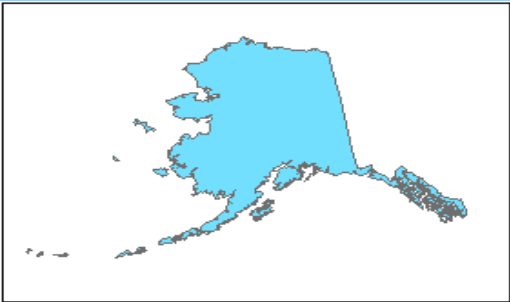


# *Protection of Life*

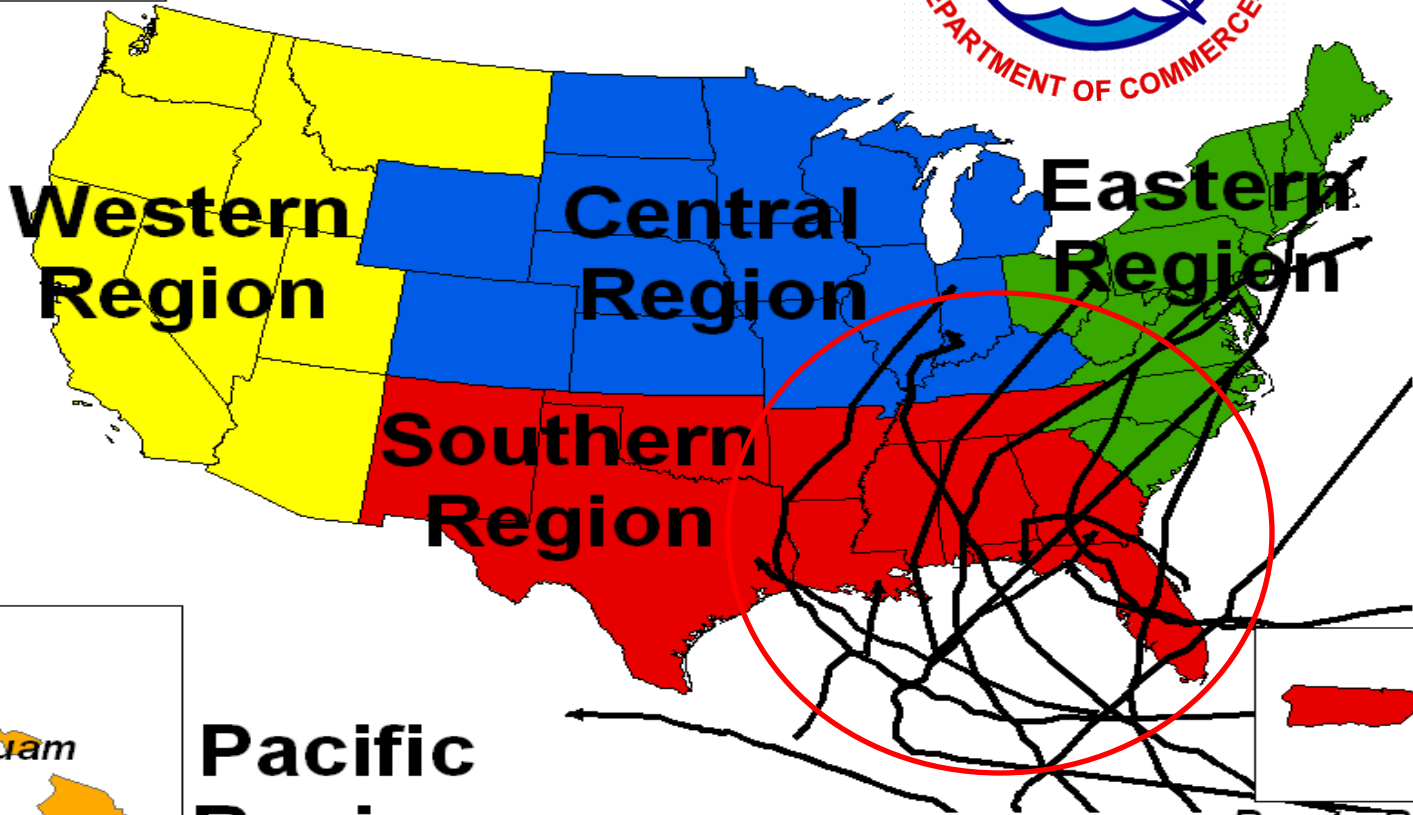
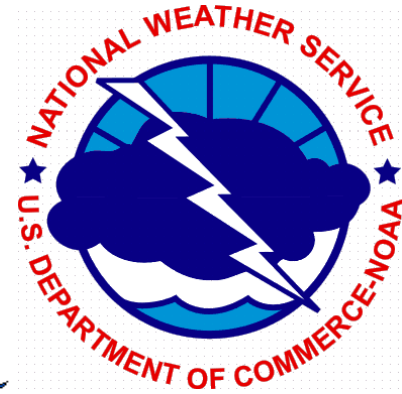
Your **National Weather Service** improves its  
hurricane EM decision-support  
**for a more resilient homeland !**  
Emergency Management Forum  
from: Fort Worth, TX – June 16, 2010

**Bill Proenza, Regional Director  
National Weather Service – Southern USA**

# NWS is divided into six large regions. The Southern has 27% of NWS Offices



**Alaska  
Region**



**Western  
Region**

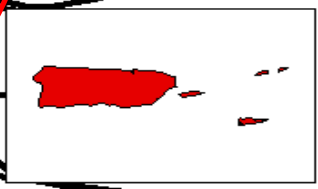
**Central  
Region**

**Eastern  
Region**

**Southern  
Region**

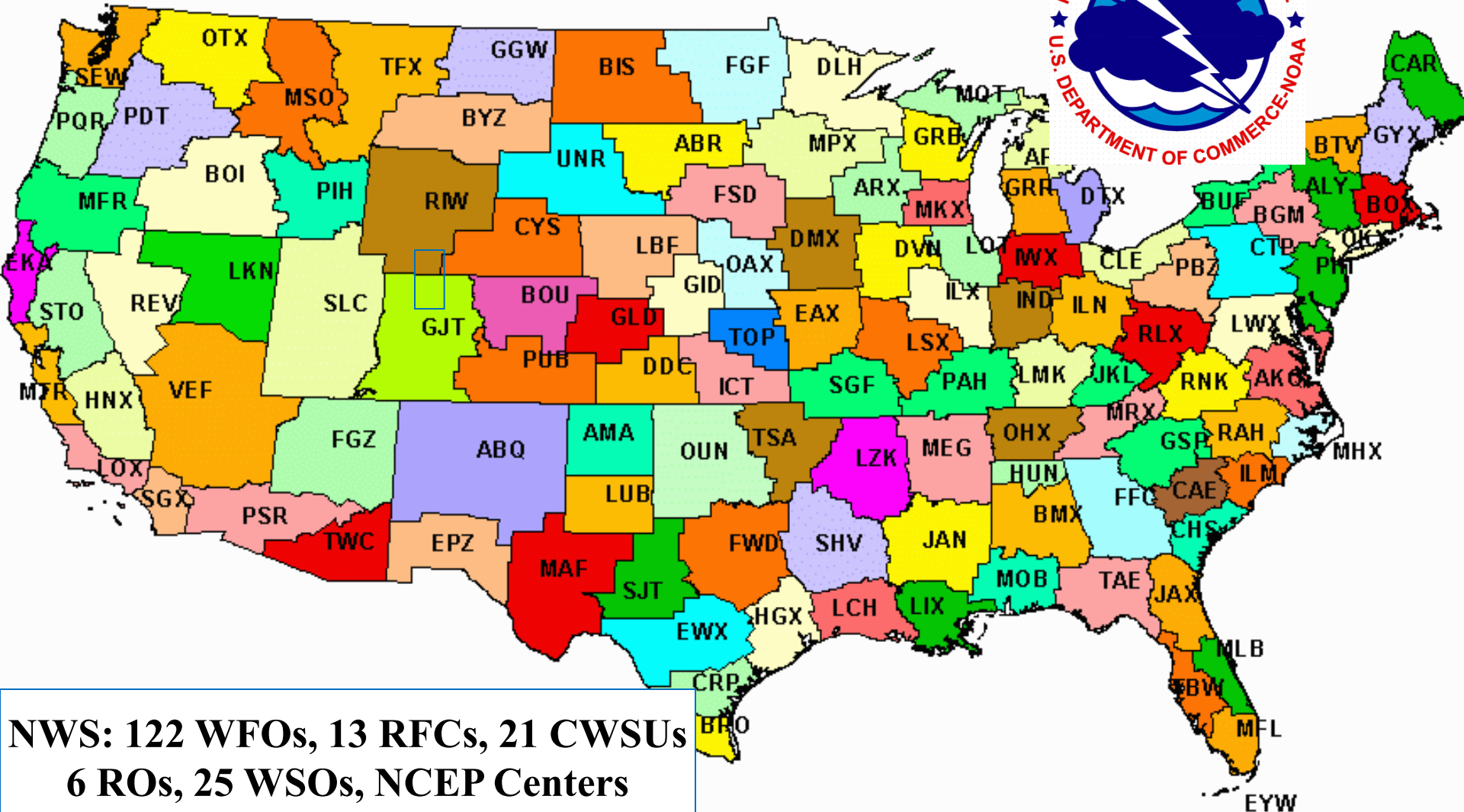
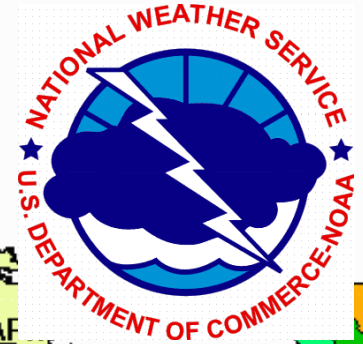


**Pacific  
Region**

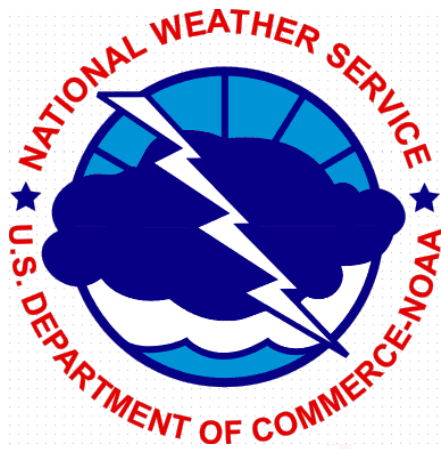


**Puerto Rico and  
Virgin Islands**

# Local /state EMs & Media best serve our Public with local impact weather from their nearby WFO



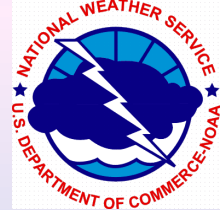
**NWS: 122 WFOs, 13 RFCs, 21 CWSUs  
6 ROs, 25 WSOs, NCEP Centers**



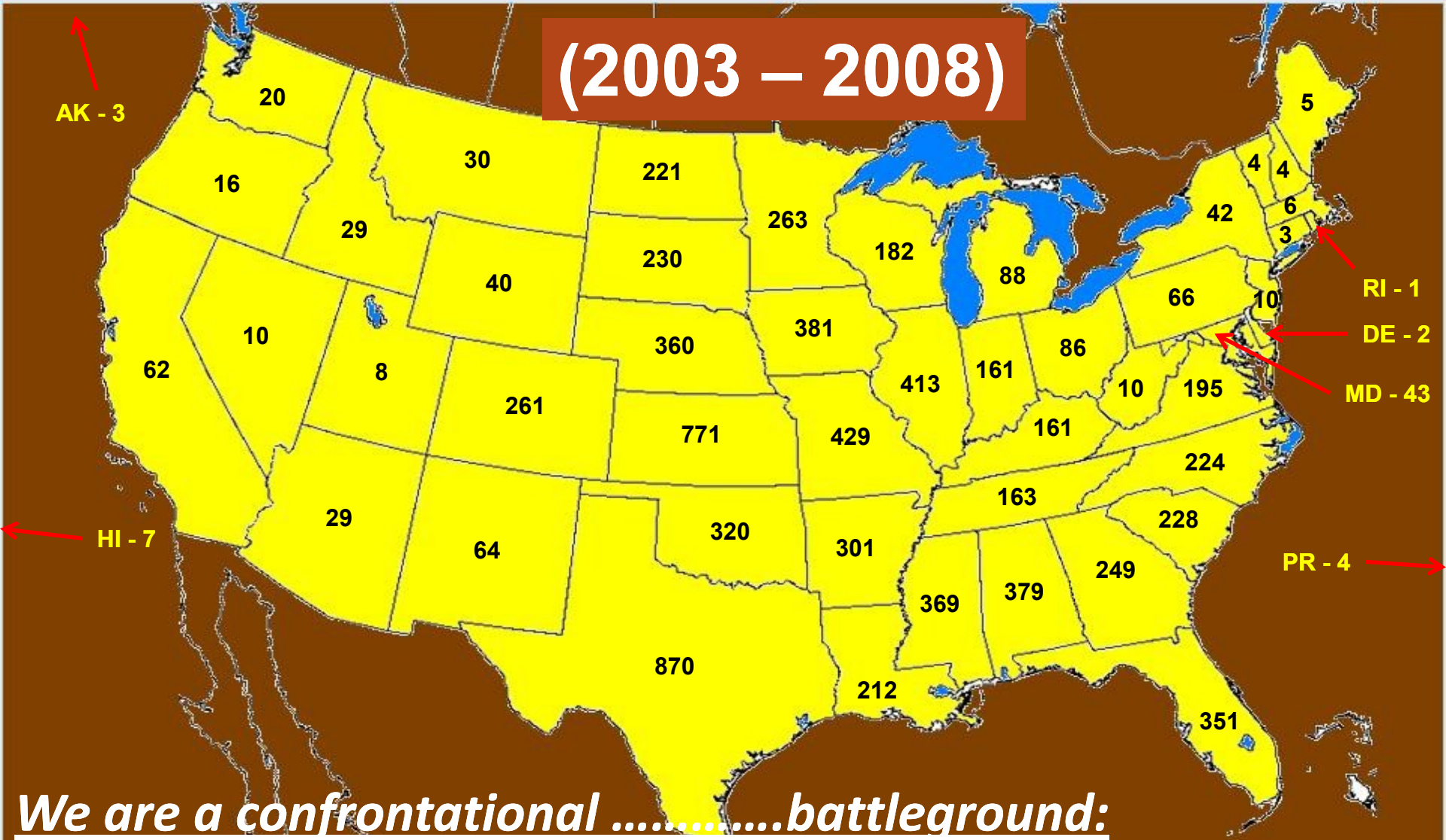
For the latest NASA satellite views (1km to 250m resolution) all around the Earth, including the subset of the Deepwater Horizon oil spill:

**<http://rapidfire.sci.gsfc.nasa.gov>**

# The USA had 8386 Tornadoes in 6 years. We are uniquely tornado vulnerable !

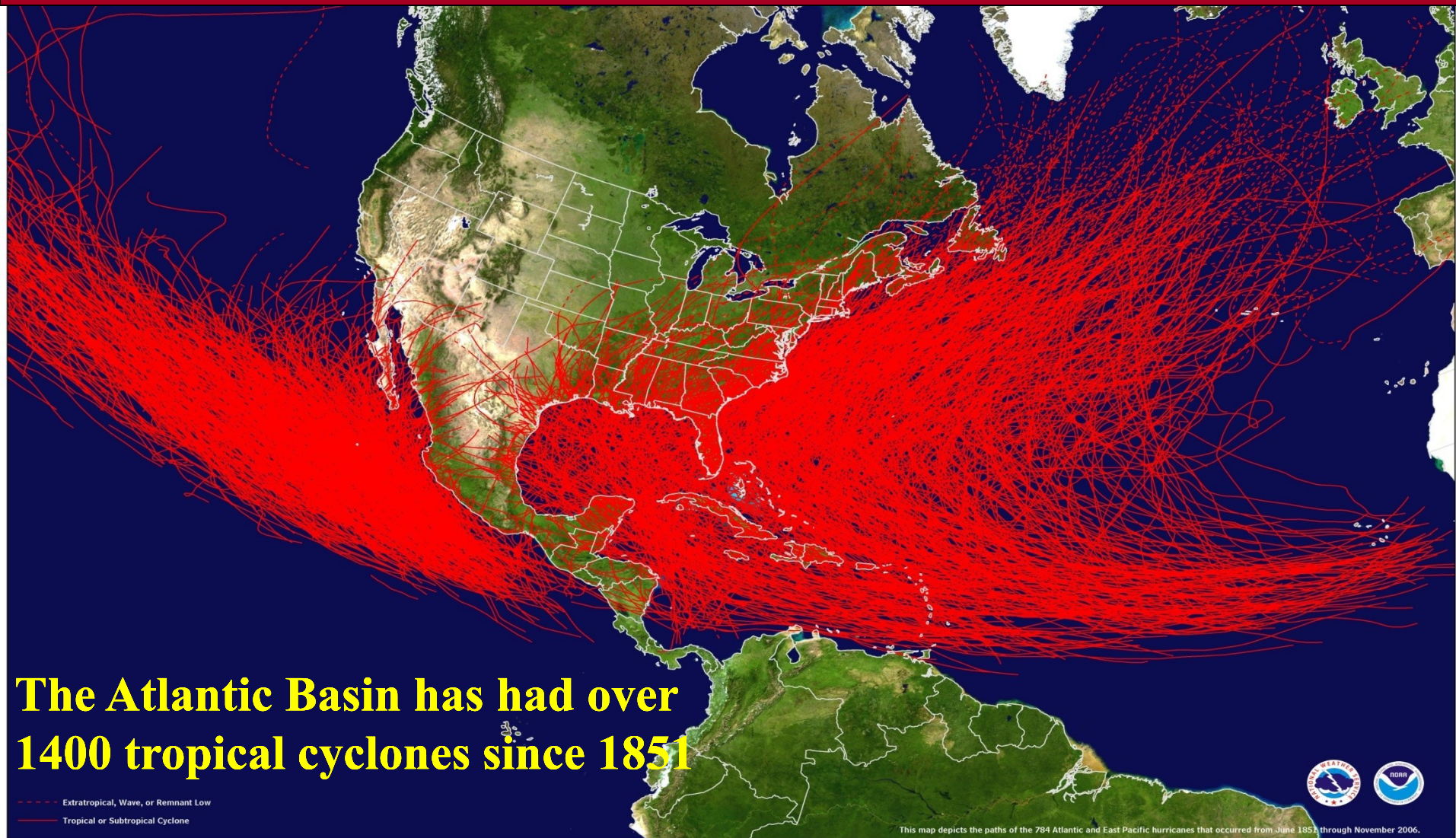


(2003 – 2008)



We are a confrontational .....battleground:  
continental vs tropical air. e.g. '04: 1817; '08: 1690

# We know we're geographically placed to be hurricane vulnerable !

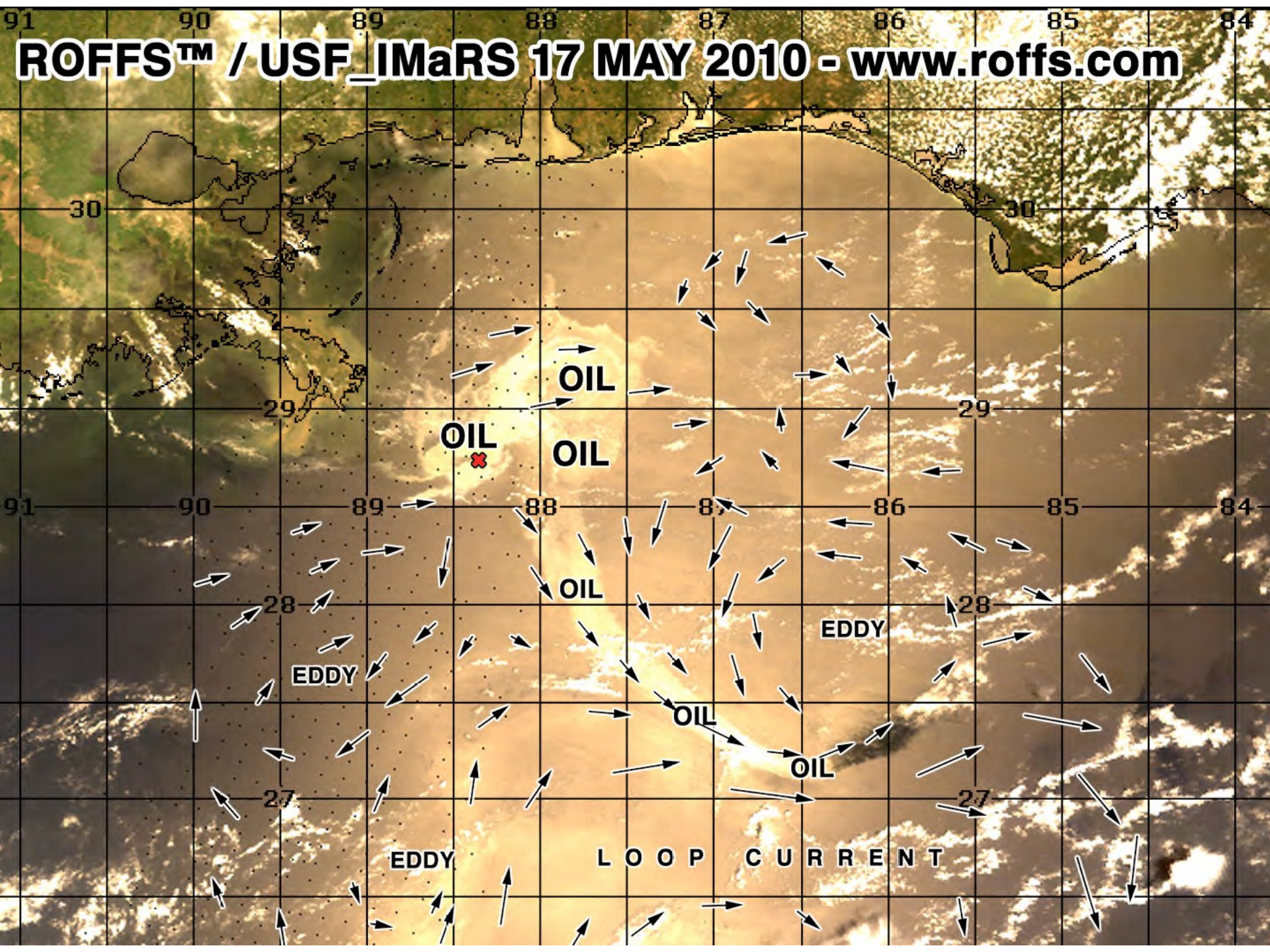


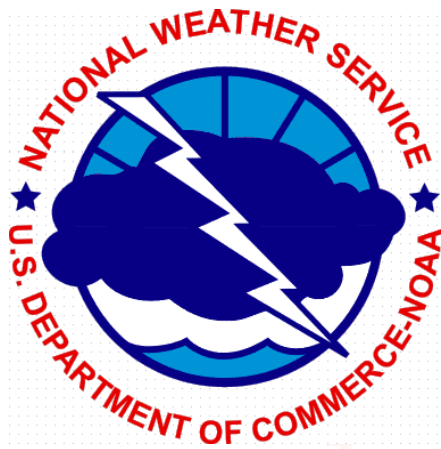
The Atlantic Basin has had over 1400 tropical cyclones since 1851



This map depicts the paths of the 784 Atlantic and East Pacific hurricanes that occurred from June 1851 through November 2006.

**ROFFS™ / USF\_IMaRS 17 MAY 2010 - [www.roffs.com](http://www.roffs.com)**

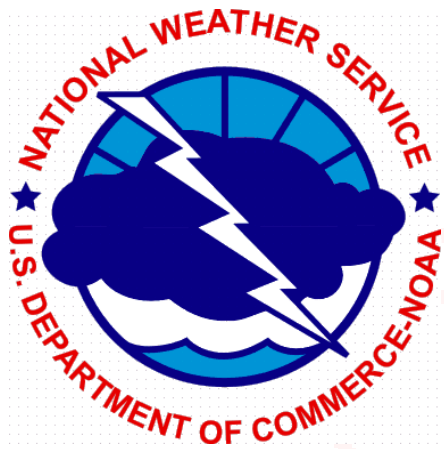




For the latest NASA satellite views (1km to 250m resolution) all around the Earth, including the subset of the Deepwater Horizon oil spill:

<http://rapidfire.sci.gsfc.nasa.gov/subsets/?project=gulfofmexico>





# **2010 Tropical Season Changes, Outlooks etc.**

**Saffir-Simpson Scale Adjustments/Changes:**

**Wind Based only, not surge or pressure.**

**Surges depicted as height above ground !**

**Watch/Warning Lead-Times increases 12 hrs**

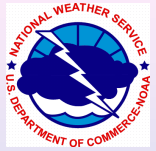
**TC Public Advisory Format Change**

**Tropical Cyclone Graphical Monthly**

**Tropical Cyclone Genesis & Climatology**



# Saffir-Simpson Scale Changes



## Why was Saffir-Simpson Hurricane categories changed?

- Originally was designed independent of surge, atmospheric pressure etc. Yet, later it was allowed to slip into a tool to convey the strength/threats of storm surge.

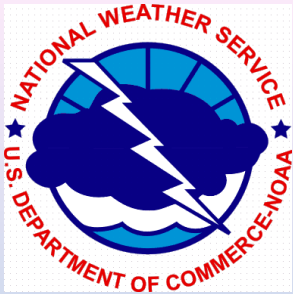
### However:

- storm surge forecasts are dependent on many other factors:
  - **Storm winds**
  - **Size** (e.g radius of maximum wind)
  - **Motion** (both speed & direction relative to coastline)
  - **Barometric pressure**
  - **Bathymetry** (can cause significant variances)
  - **Local topographical features**
- **Storm surge is a separate storm component**. (Katrina, Ike, Charley)



# Saffir-Simpson Wind Scale Defined

<b>CAT</b>	<b>SUSTAINED WIND (mph)</b>	<b>DAMAGE</b>	<b>TYPE OF DAMAGE</b>
<b>1</b>	<b>75-95</b>	<b>MINIMAL</b>	Damage primarily to shrubbery, trees, foliage and unanchored mobile homes. No real damage to other structures.
<b>2</b>	<b>96-100</b>	<b>MODERATE</b>	Some trees blown down. Major damage to exposed mobile homes. Some damage to roofing materials, windows and doors.
<b>3</b>	<b>111-130</b>	<b>EXTENSIVE</b>	Large trees blown down. Mobile homes destroyed. Some structural damage to roofing materials of buildings. Some structural damage to small buildings.
<b>4</b>	<b>131-155</b>	<b>EXTREME</b>	Trees blown down. Complete destruction of mobile homes. Extensive damage to roofing materials, windows and doors. Complete failure of roofs on many small residences.
<b>5</b>	<b>&gt;155</b>	<b>CATASTROPHIC</b>	Complete failure of roofs on many residences and industrial buildings. Extensive damage to windows



# Saffir-Simpson Wind Scale – Updated Summary

**Category One Hurricane** (Sustained winds 74-95 mph, 64-82 kt, or 119-153 km/hr).

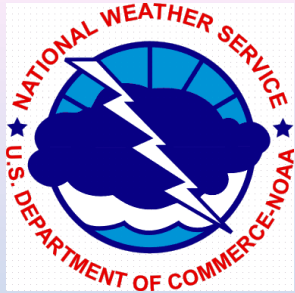
*Very dangerous winds will produce some damage.*

People, livestock, and pets struck by flying or falling debris could be injured or killed. Older mobile homes could be destroyed. Poorly constructed frame homes can experience major damage. Unprotected windows break by flying debris. Masonry chimneys can be toppled. Extensive damage to power lines and poles will likely result in power outages that could last a few to several days.

**Category Two Hurricane** (Sustained winds 96-110 mph, 83-95 kt, or 154-177 km/hr).

*Extremely dangerous winds will cause extensive damage.*

Substantial risk of injury or death to people, livestock, and pets due to flying and falling debris. Mobile homes have a very high chance of being destroyed. Unprotected windows broken by flying debris. Well-constructed frame homes could sustain major roof and siding damage. Some trees will be snapped or uprooted. Near-total power loss is expected with outages that could last from several days to weeks. Potable water could become scarce.



# Saffir-Simpson Wind Scale – Updated Summary

**Category Three Hurricane** (Sustained winds 111-130 mph, 96-113 kt, or 178-209 km/hr).

*Devastating damage will occur.*

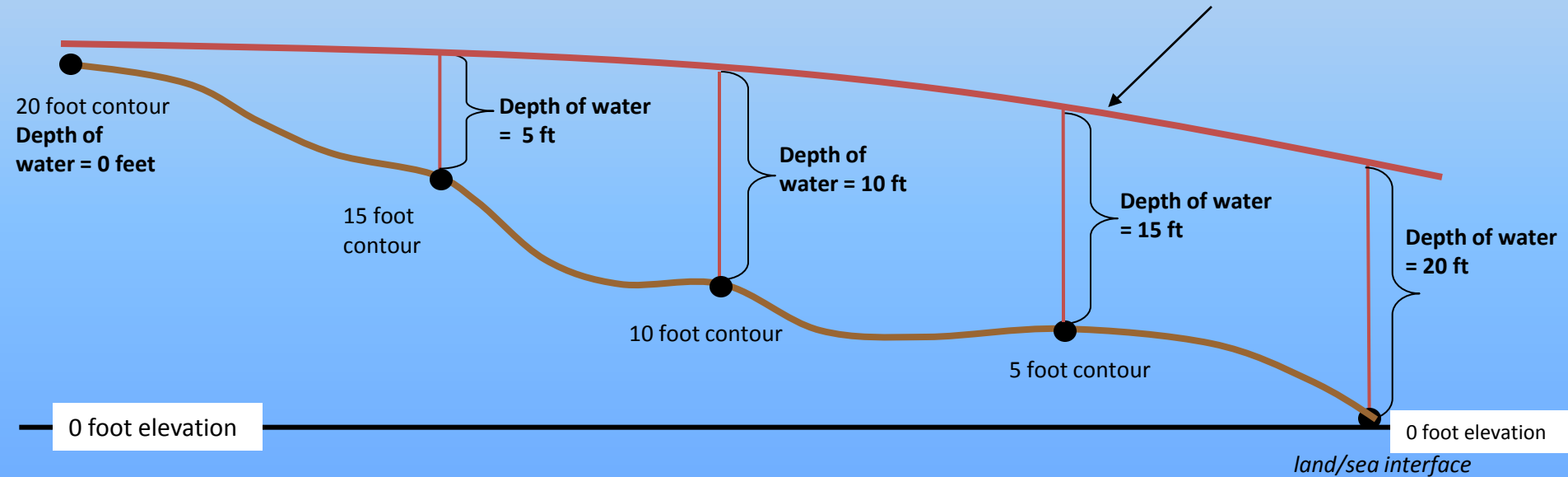
High risk of injury or death to people, livestock, and pets due to flying and falling debris. Mobile homes and some frame homes destroyed. Windows broken by flying debris. Well-built frame homes can experience major damage. Isolated structural damage to wood or steel framing can occur. Complete failure of older metal buildings possible. Many trees will be snapped or uprooted. Electricity and water unavailable for several days to a few weeks.

# Storm Surge

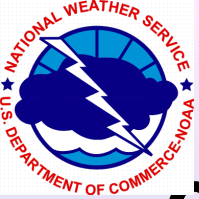
What does a 20-foot storm surge really mean to your location?

Storm surge models output water surface elevations for a specific area (grid cell)

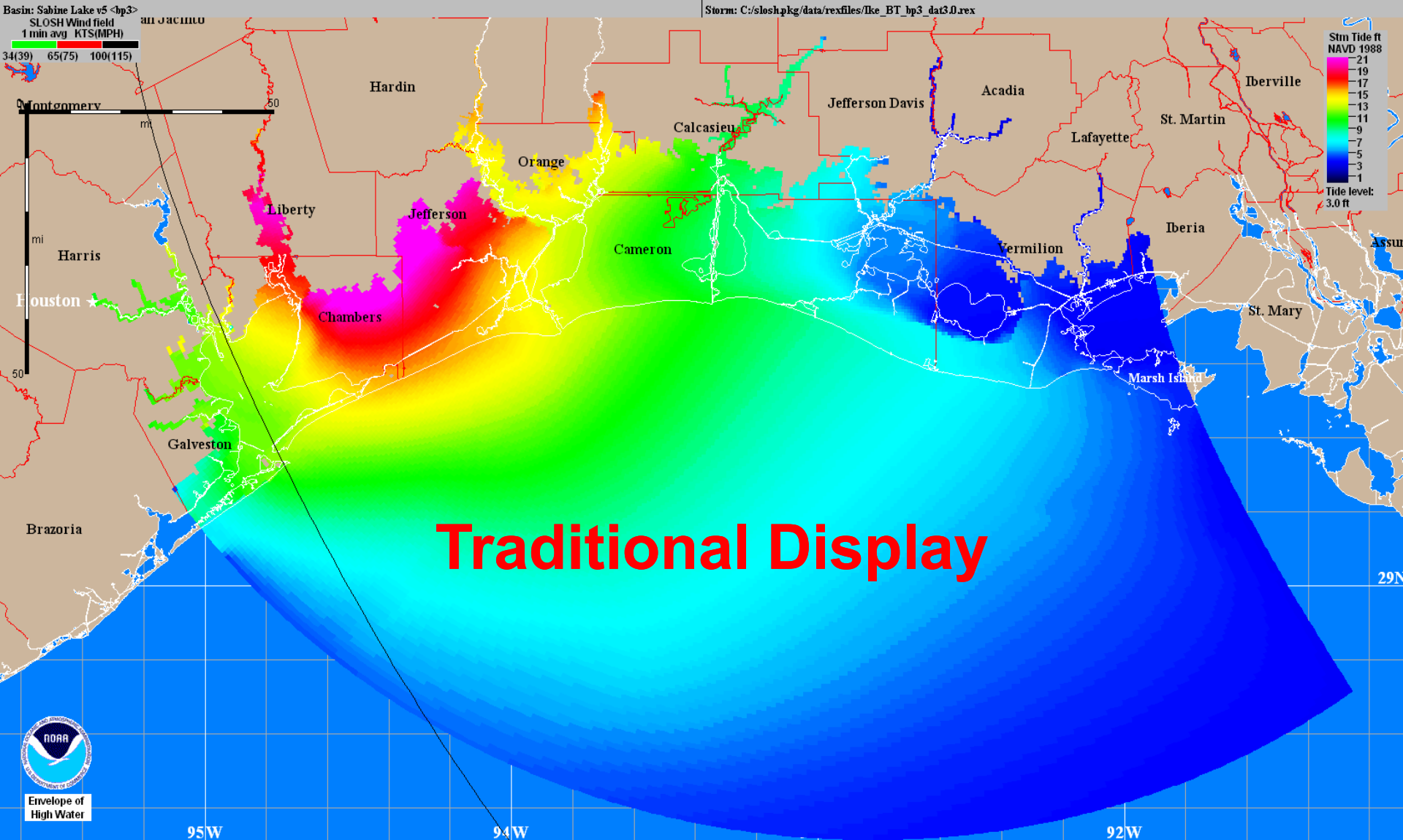
**Water Surface Elevation = 20-foot surge\***

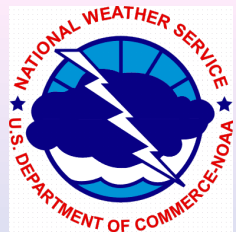


**\*This only represents surge. There may be waves on top of the surge.**

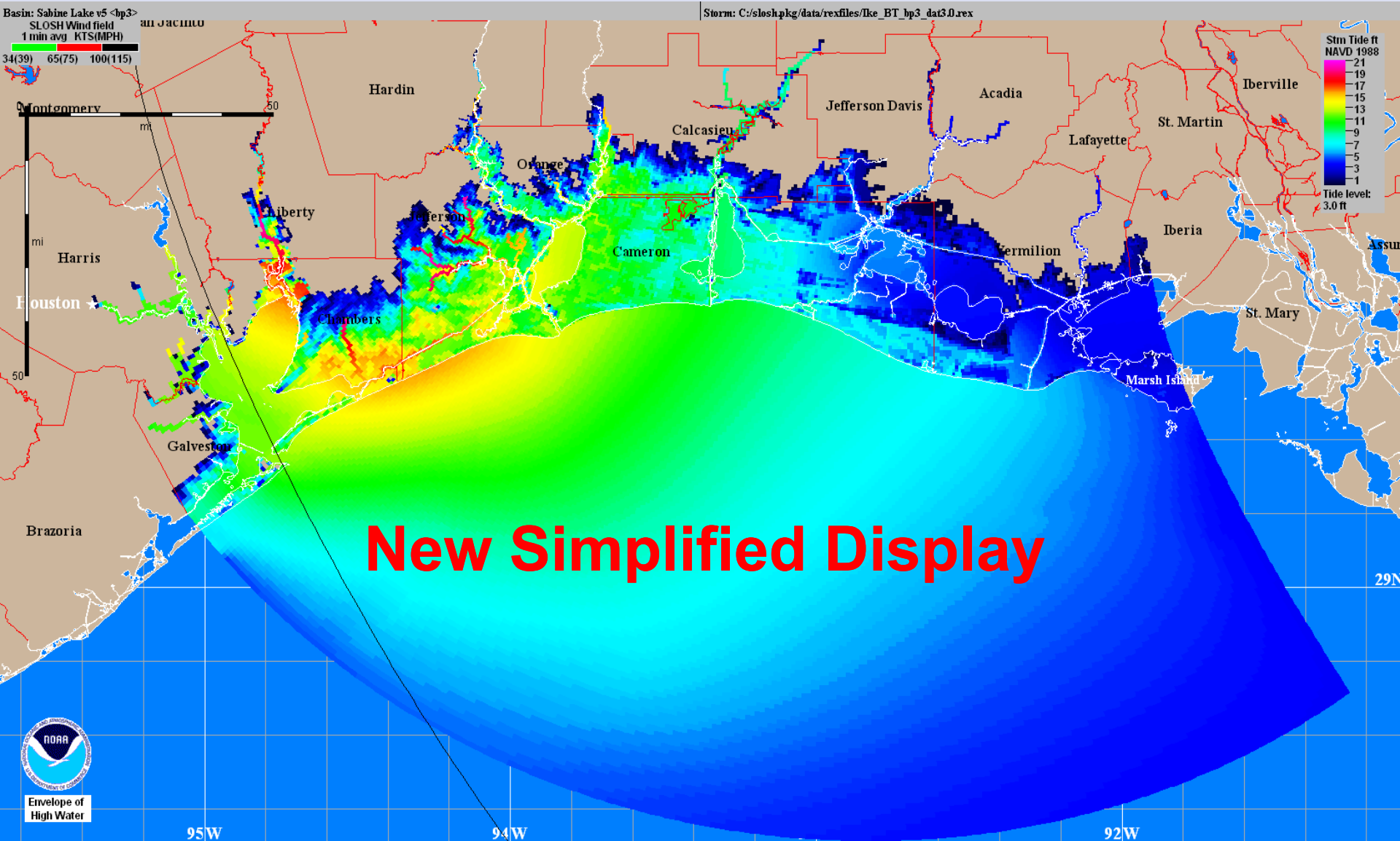


# Old Surge Height Display: example: above normal sea level



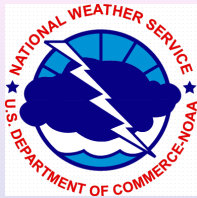


# New Surge Height Display: Above Ground Level (AGL)



Envelope of High Water





# 2010 Watch/Warning Lead Times

- Watches and warnings for landfalling tropical storm and hurricane conditions will have:  
**12-hour longer lead times.**
  - **TROPICAL STORM/HURRICANE WATCHES:** instead of 36 hours, will be **48 hours.**
  - **TROPICAL STORM/HURRICANE WARNINGS:** instead of 24 hours, will be **36 hours.**



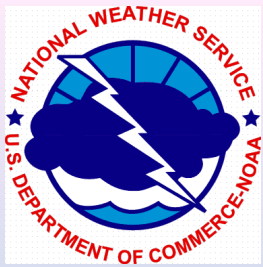
# TC Public Advisory Changes



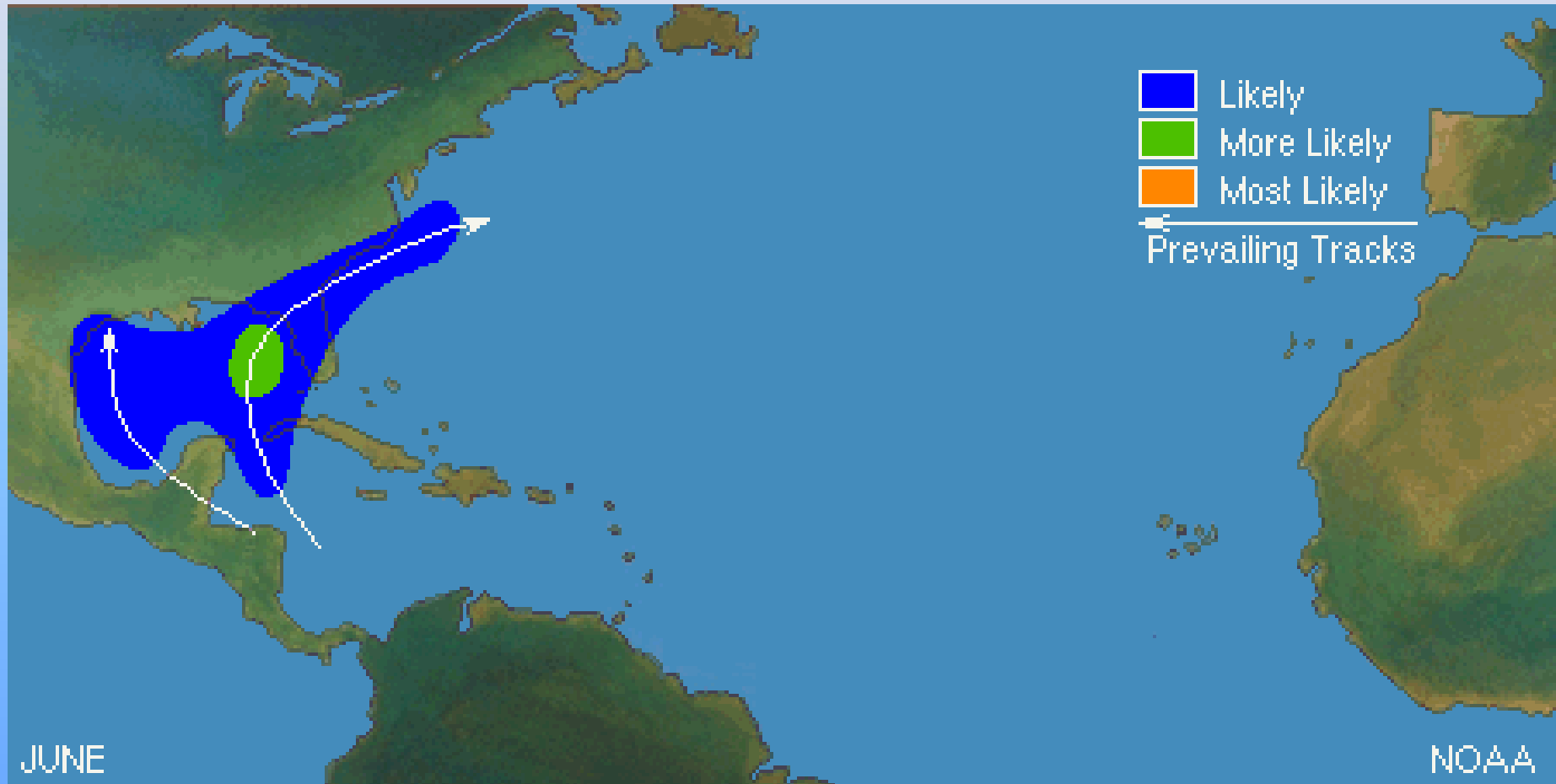
Format of Tropical Cyclone Public Advisory is changing.

**Most significant changes are:**

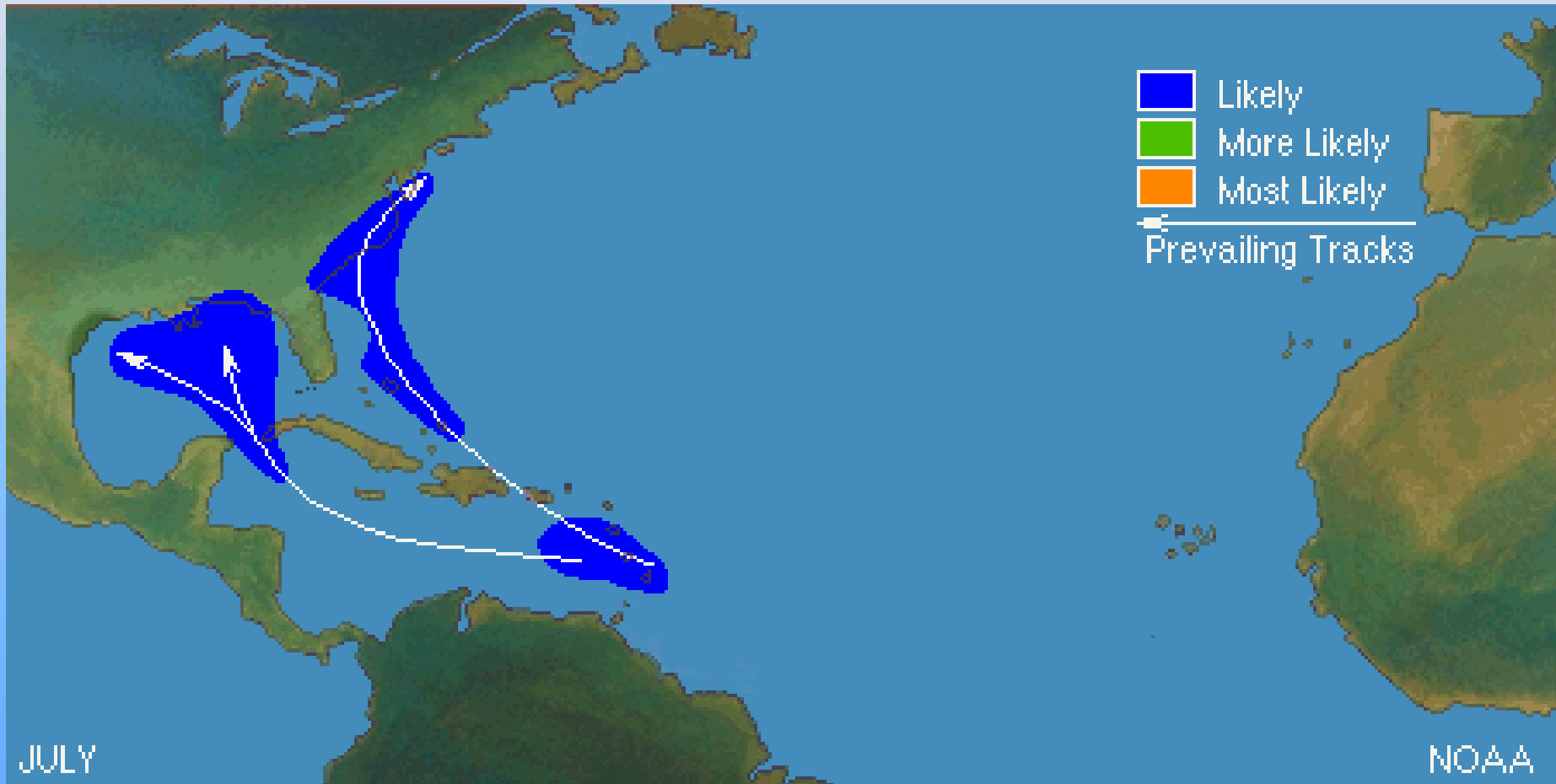
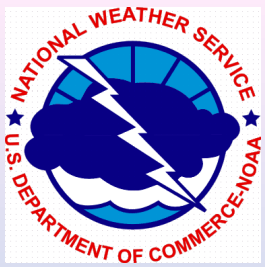
- The Public Advisory will be organized into **“Sections”**.
  - Within these sections, keywords will be used to assist the human eye and computer software to find specific information more readily.
- The **“Summary”** section of the advisory will move to the top of the product, immediately following the headline.
  - The summary section will contain more information than it did previously.
- Watch and warning information will be organized differently and be presented in **“List”** or **“Bullet”** format.

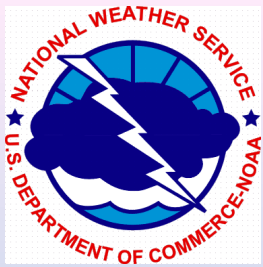


# Tropical Cyclone Climatology

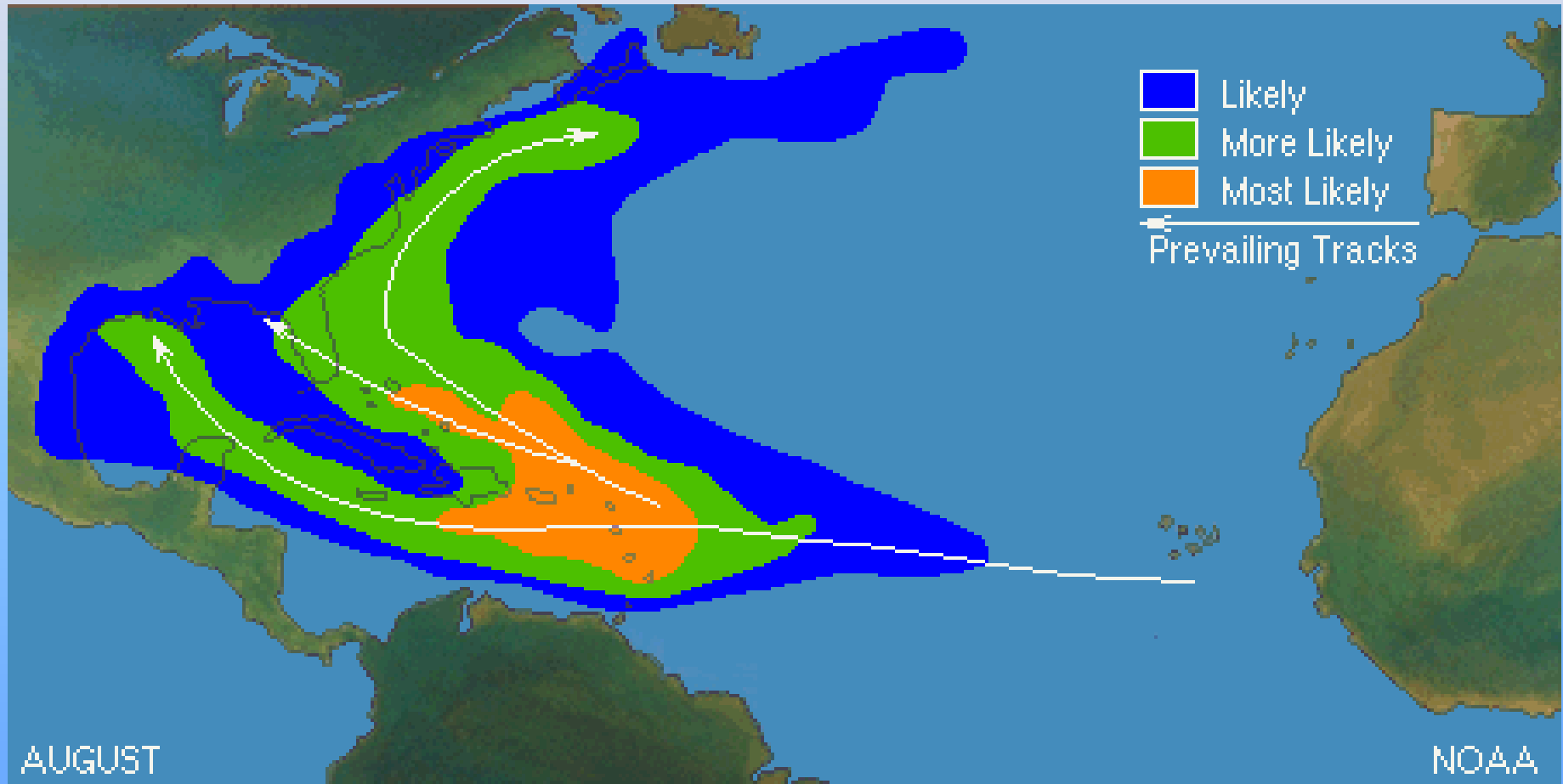


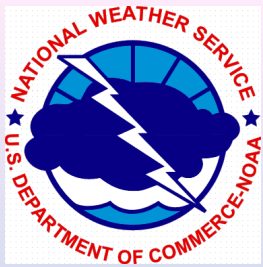
# Tropical Cyclone Climatology



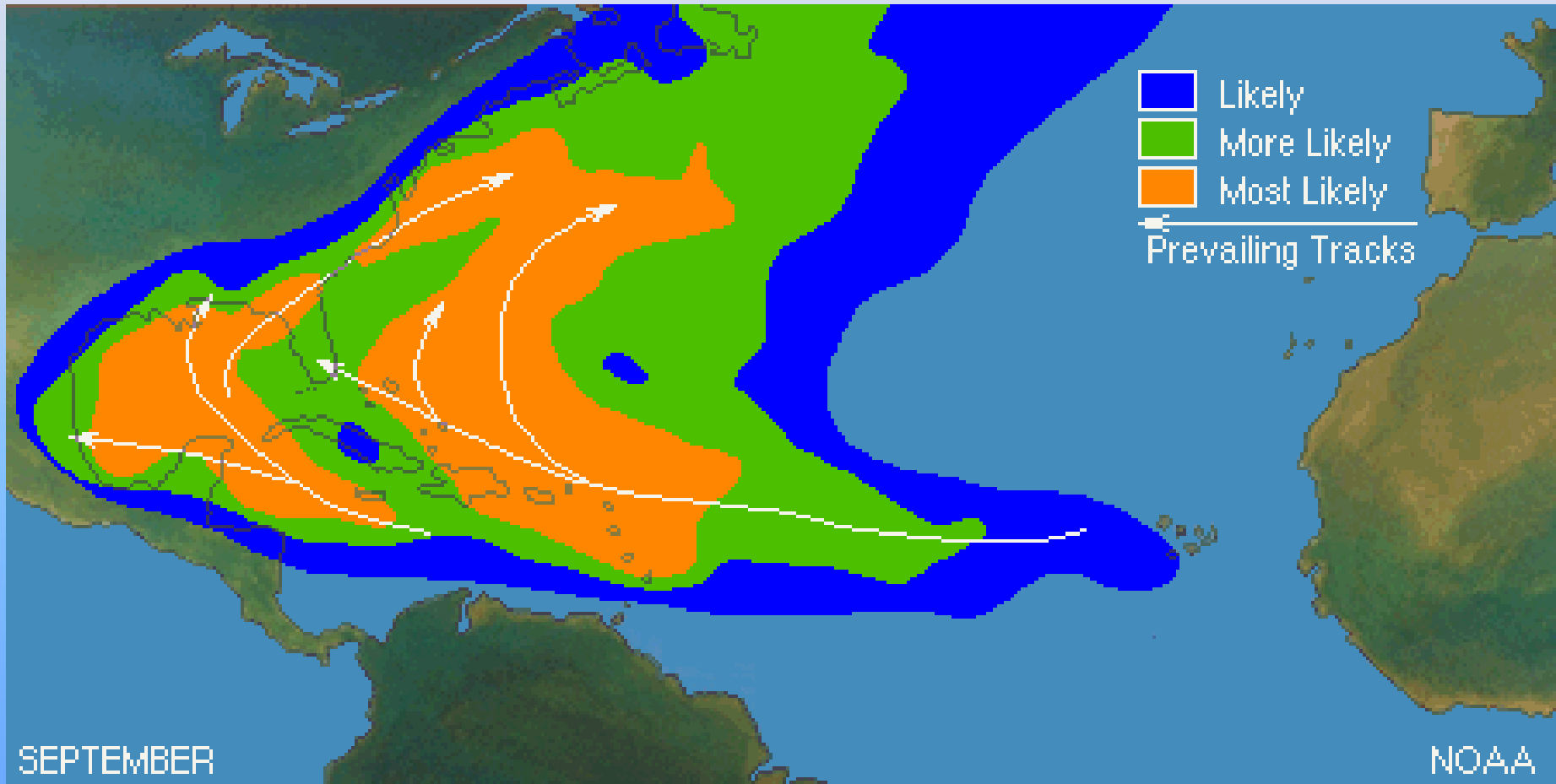


# Tropical Cyclone Climatology



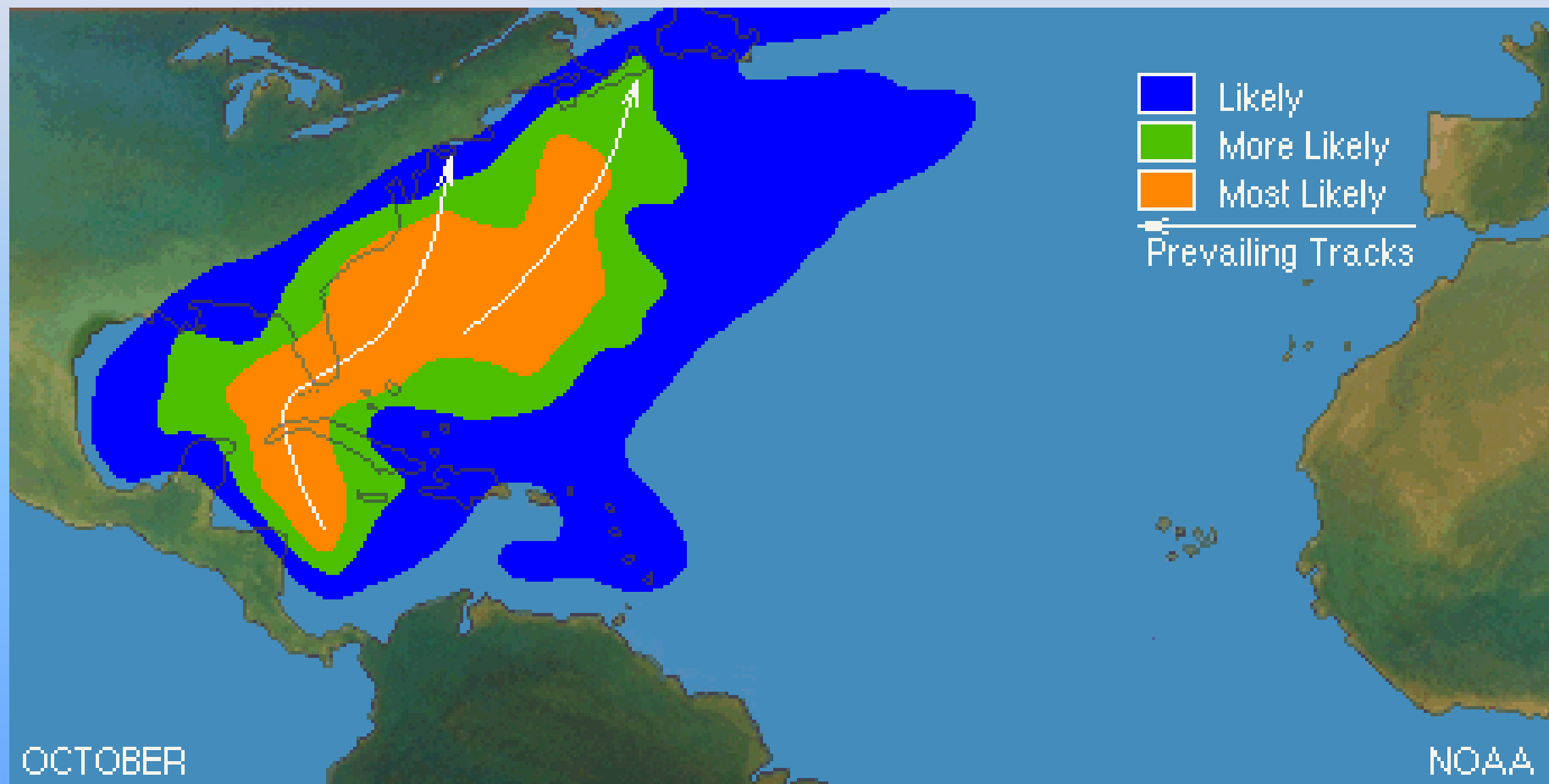


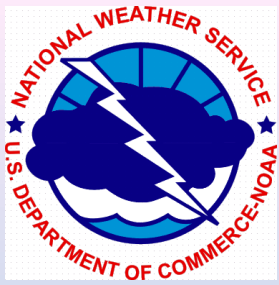
# Tropical Cyclone Climatology



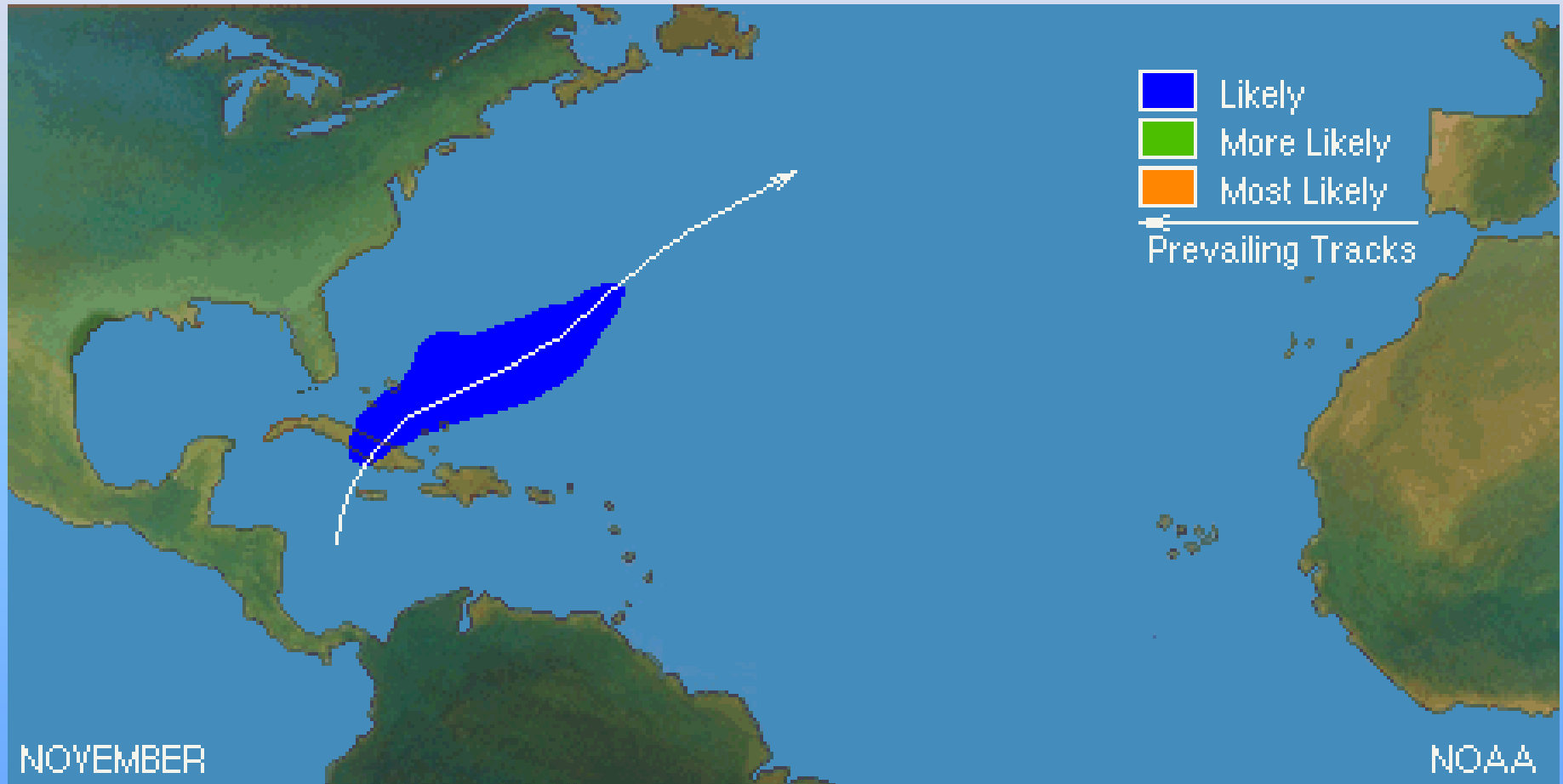


# Tropical Cyclone Climatology





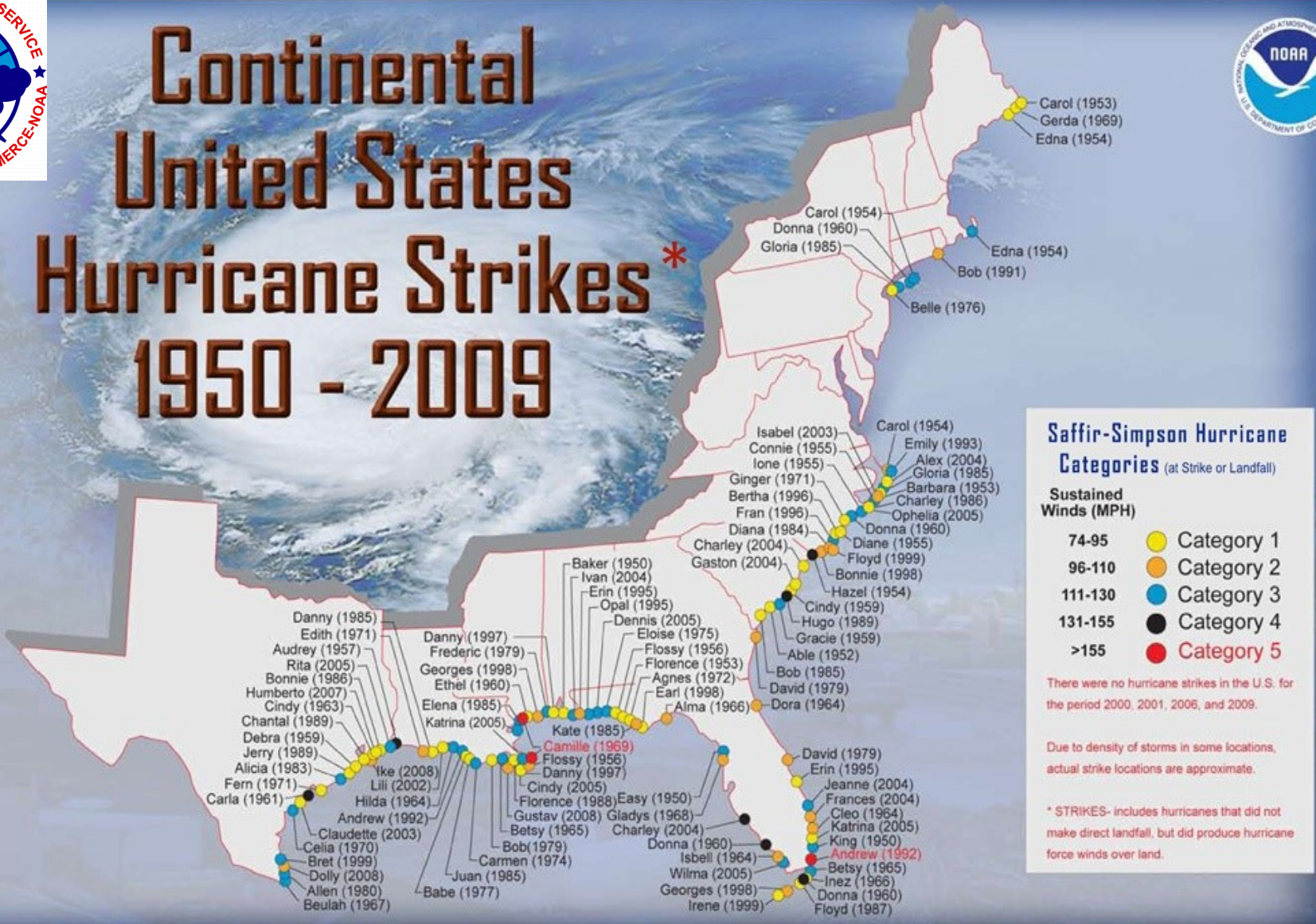
# Tropical Cyclone Climatology







# Continental United States Hurricane Strikes 1950 - 2009



### Saffir-Simpson Hurricane Categories (at Strike or Landfall)

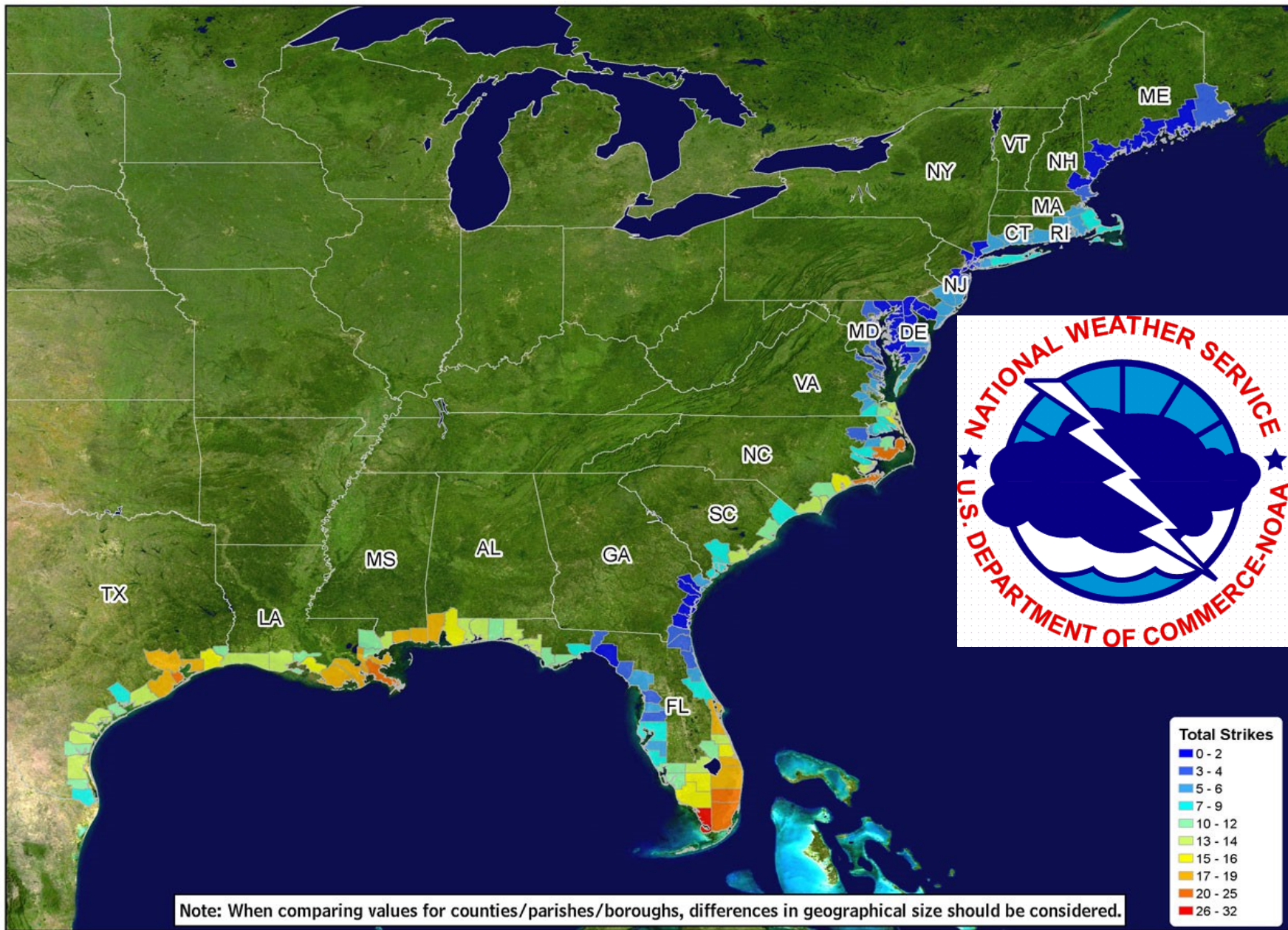
**Sustained Winds (MPH)**

- 74-95 ● Category 1
- 96-110 ● Category 2
- 111-130 ● Category 3
- 131-155 ● Category 4
- >155 ● Category 5

There were no hurricane strikes in the U.S. for the period 2000, 2001, 2006, and 2009.

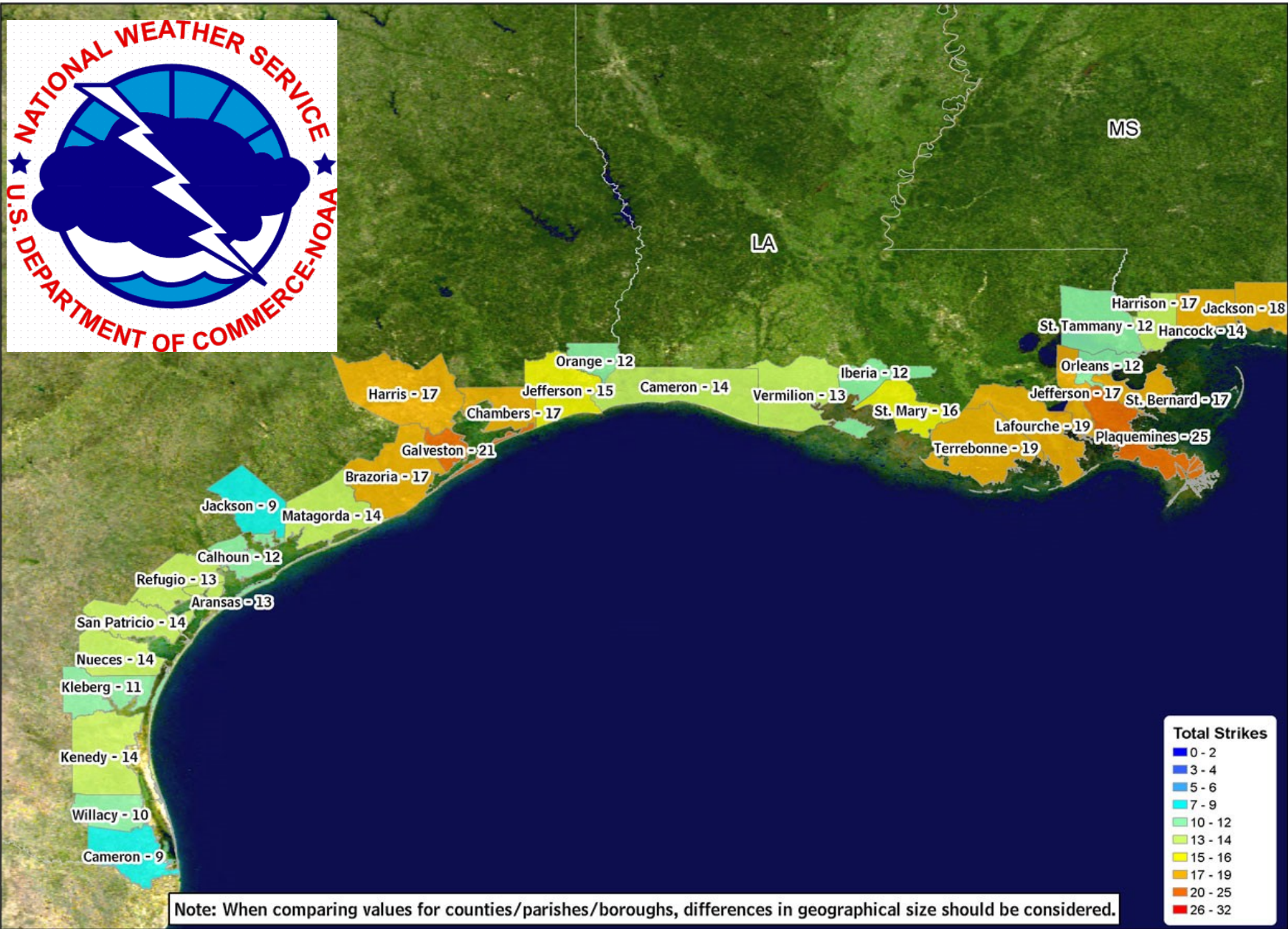
Due to density of storms in some locations, actual strike locations are approximate.

\* STRIKES- includes hurricanes that did not make direct landfall, but did produce hurricane force winds over land.



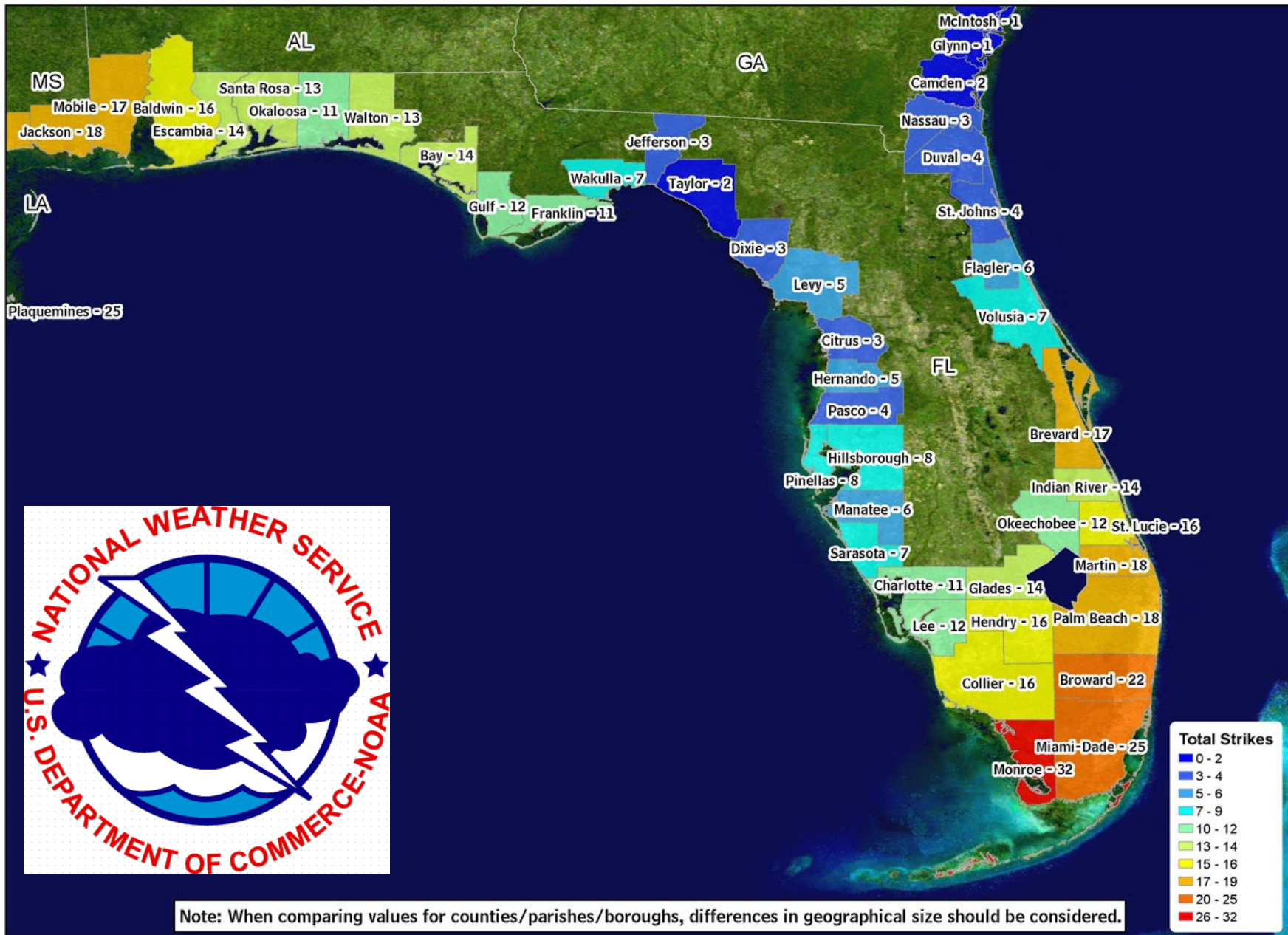
## Total number of hurricane strikes by counties/parishes/boroughs, 1900-2009

Data from NWS NHC 46: Hurricane Experience Levels of Coastal County Populations from Texas to Maine. Jerry D. Jarrell, Paul J. Hebert, and Max Mayfield. August, 1992, with updates.



## Total number of hurricane strikes by counties/parishes/boroughs, 1900-2009

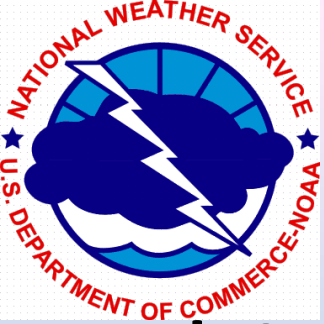
Data from NWS NHC 46: Hurricane Experience Levels of Coastal County Populations from Texas to Maine. Jerry D. Jarrell, Paul J. Hebert, and Max Mayfield. August, 1992, with updates.



Note: When comparing values for counties/parishes/boroughs, differences in geographical size should be considered.

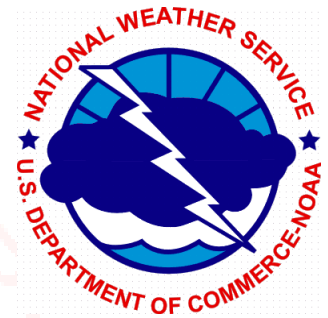
### Total number of hurricane strikes by counties/parishes/boroughs, 1900-2009

Data from NWS NHC 46: Hurricane Experience Levels of Coastal County Populations from Texas to Maine. Jerry D. Jarrell, Paul J. Hebert, and Max Mayfield. August, 1992, with updates.



# Key Tropical Cyclone Web Sites

- Latest US Coastal Weather Radars:  
<http://www.srh.weather.gov/ridge/>
- Latest Tropical Weather Outlook (Graphical):  
[http://www.nhc.noaa.gov/gtwo\\_atl.shtml](http://www.nhc.noaa.gov/gtwo_atl.shtml)
- Latest Tropical Weather Update:  
<http://www.srh.noaa.gov/srh/tropicalwx/tropical.php>
- Tropical Weather Satellite Imagery:  
<http://www.srh.noaa.gov/srh/tropicalwx/satellite.php>
- Saffir-Simpson Hurricane Wind Scale:  
<http://www.nhc.noaa.gov/aboutsshs.shtml>
- Definition of NWS Track Forecast Cone:  
<http://www.nhc.noaa.gov/aboutcone.shtml>



# The Outlook?

**The National Weather Service released its latest tropical cyclone seasonal outlook for this year on May 27, 2010.**

**Both CSU's Gray/Klotzbach and NWS foresee an active hurricane season:**

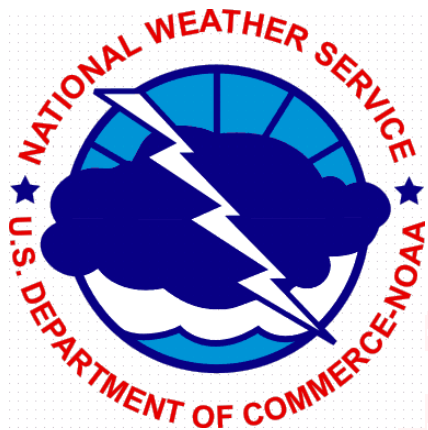
“...above-average activity...anomalous warming of Atlantic tropical sea surface temperatures and El Niño will weaken...” Gray/Klotzbach

“ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2010

Forecast Parameter and 1950-2000 Climatology (in parentheses)

CSU's Issue Date 7 April 2010....NOAA/NWS Issue Date 27 May 2010:

	CSU	NWS/NOAA
Named Storms (NS) (9.6)	15	14-23
Hurricanes (H) (5.9)	8	8-14
Major Hurricanes (MH) (2.3)	4	3-7

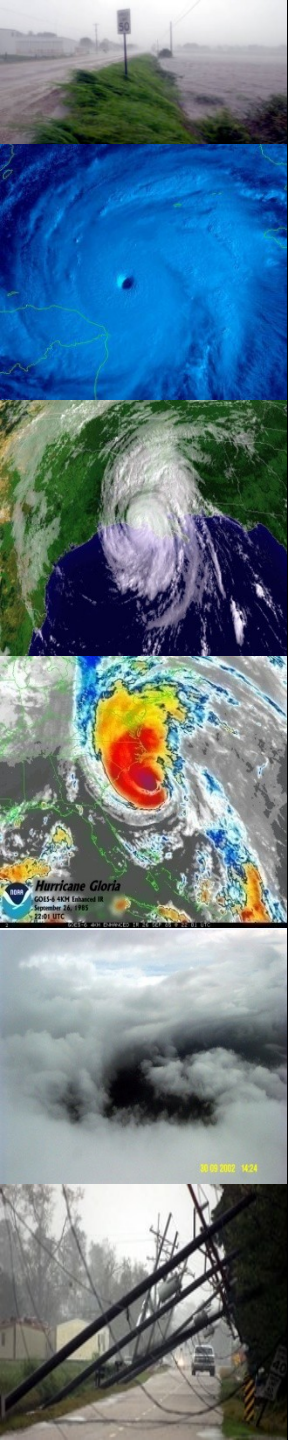


# ***Questions, comments ?***

**Bill Proenza, Regional Director  
National Weather Service, Southern U.S.**

**[bill.proenza@noaa.gov](mailto:bill.proenza@noaa.gov)**

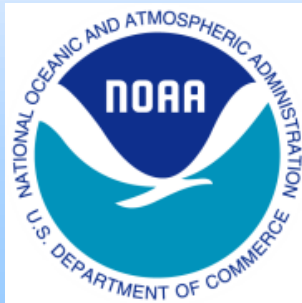
**Office: 817-978-1000**



Further, your local  
National Weather Service WFO  
epitomizes the concept:

*...decision support weather closest to  
emergency management, serves best.*

Bill Proenza, Regional Director  
National Weather Service, Southern Region



[www.SRH.weather.gov](http://www.SRH.weather.gov)

