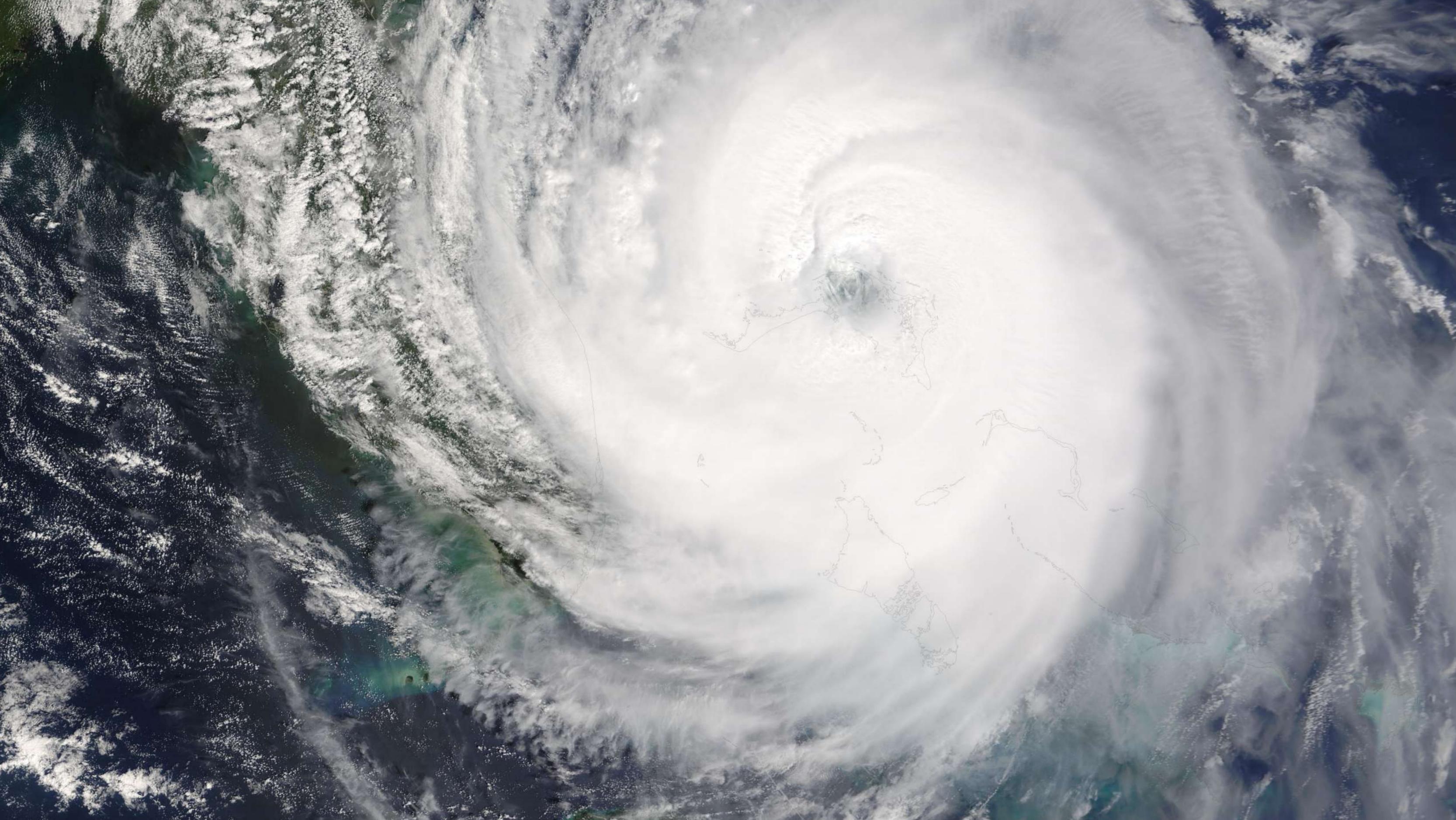
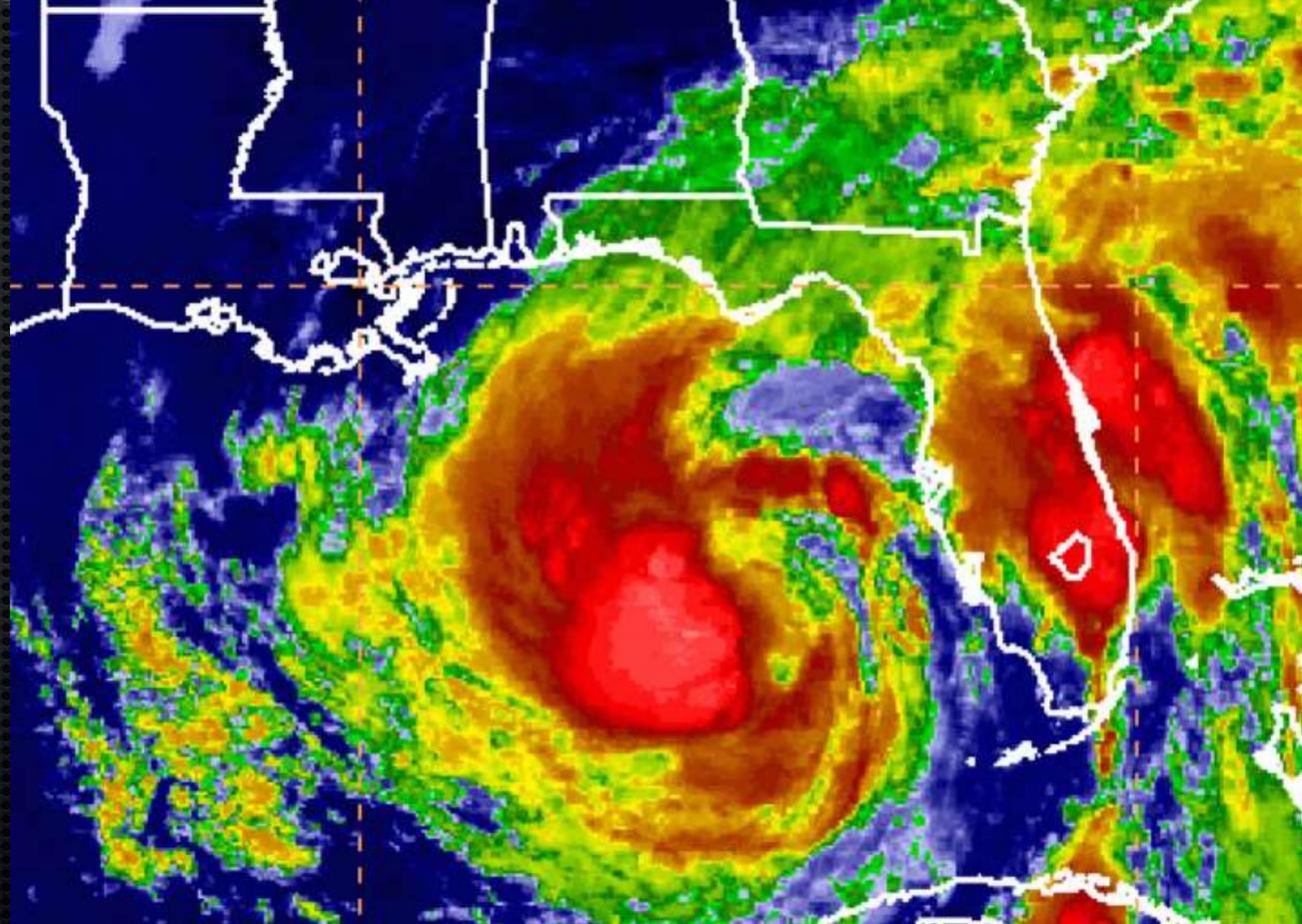
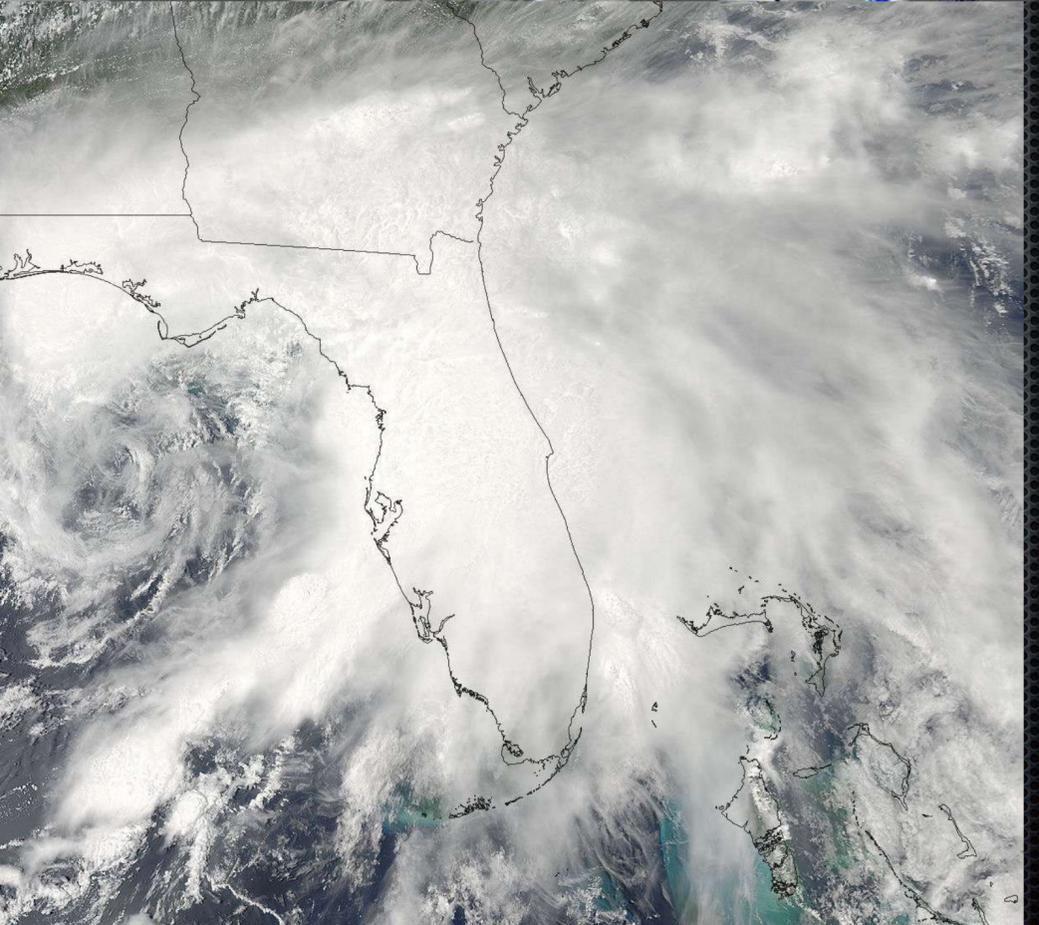
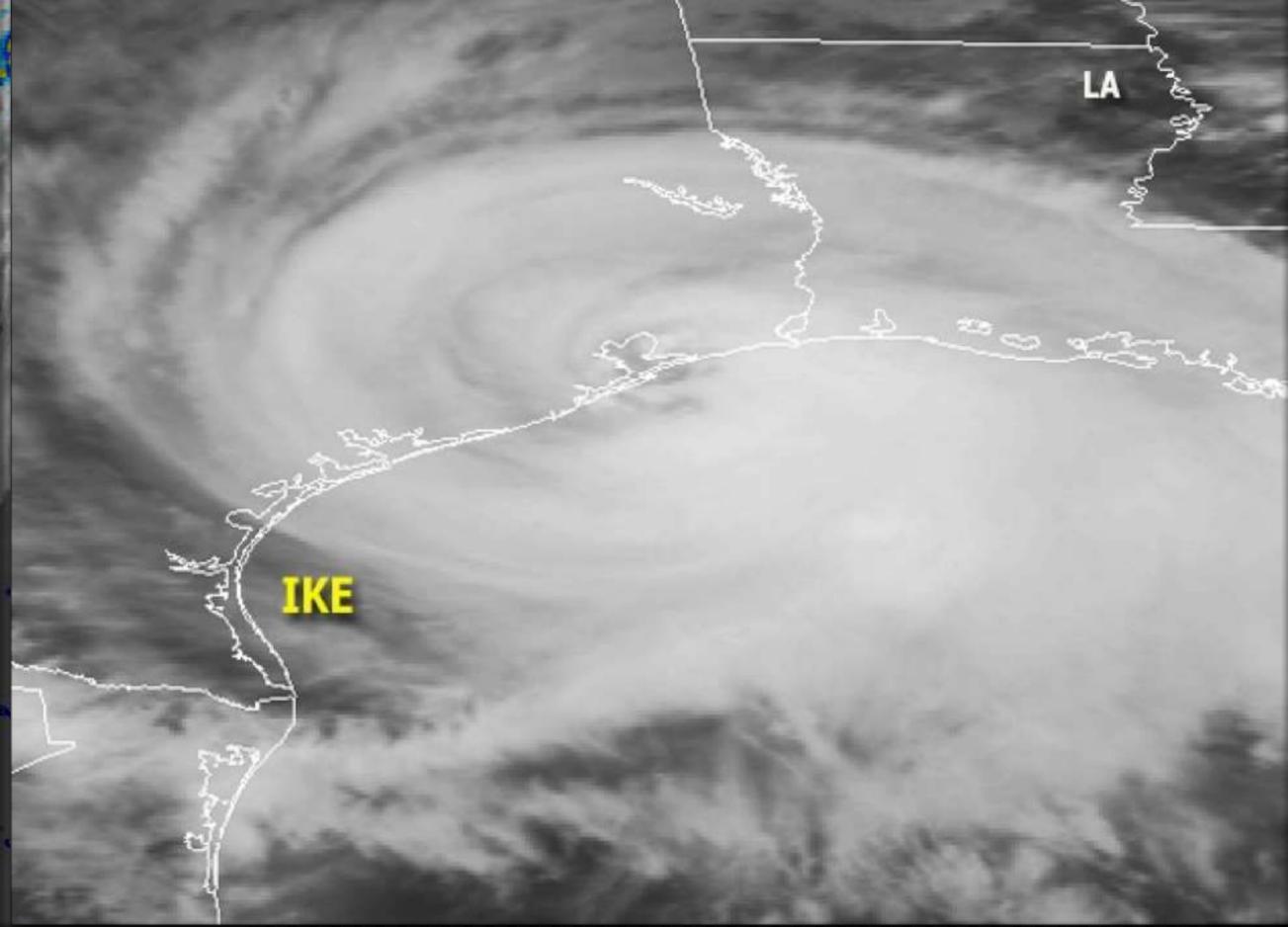
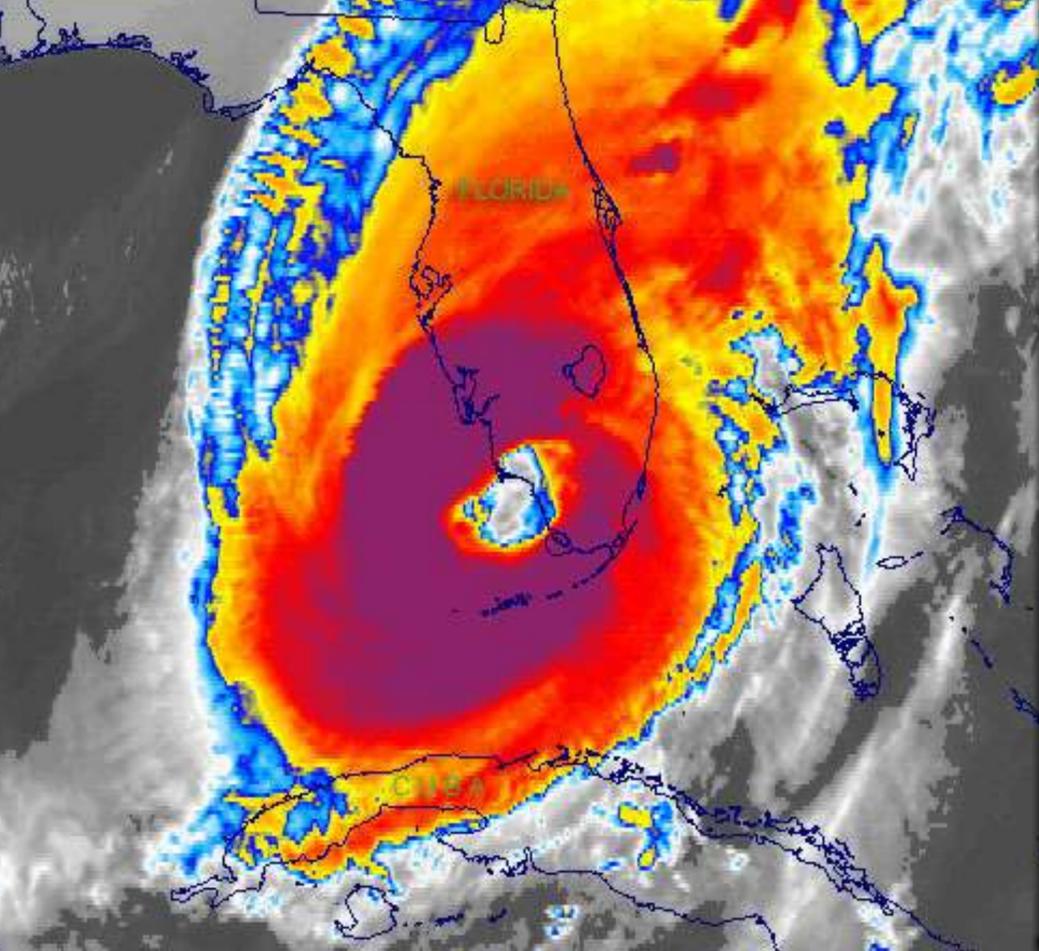


What's New in 2016 and What's Coming in 2017?

Dr. Rick Knabb
Director, National Hurricane Center

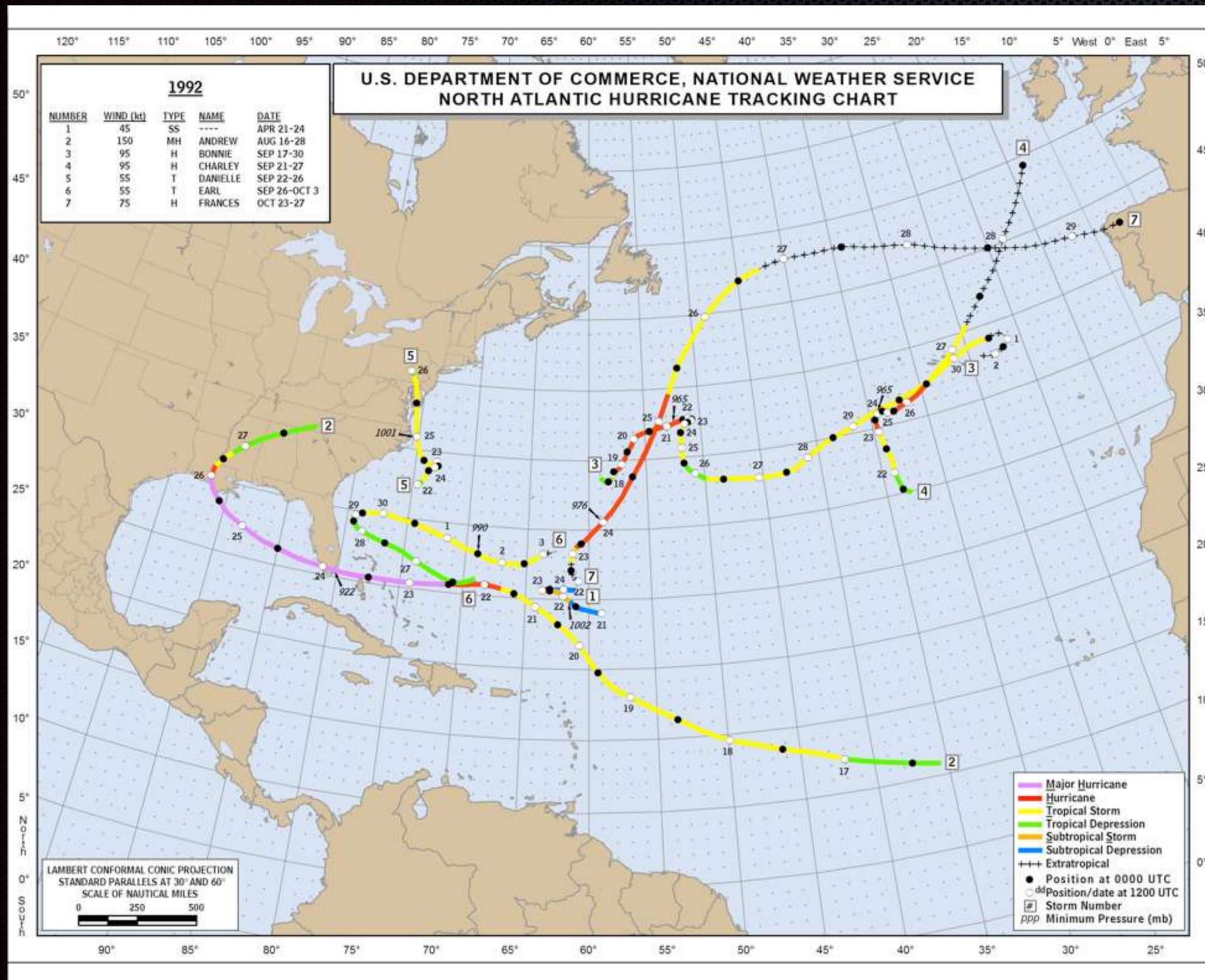
@NHCDirector
Richard.Knabb@noaa.gov

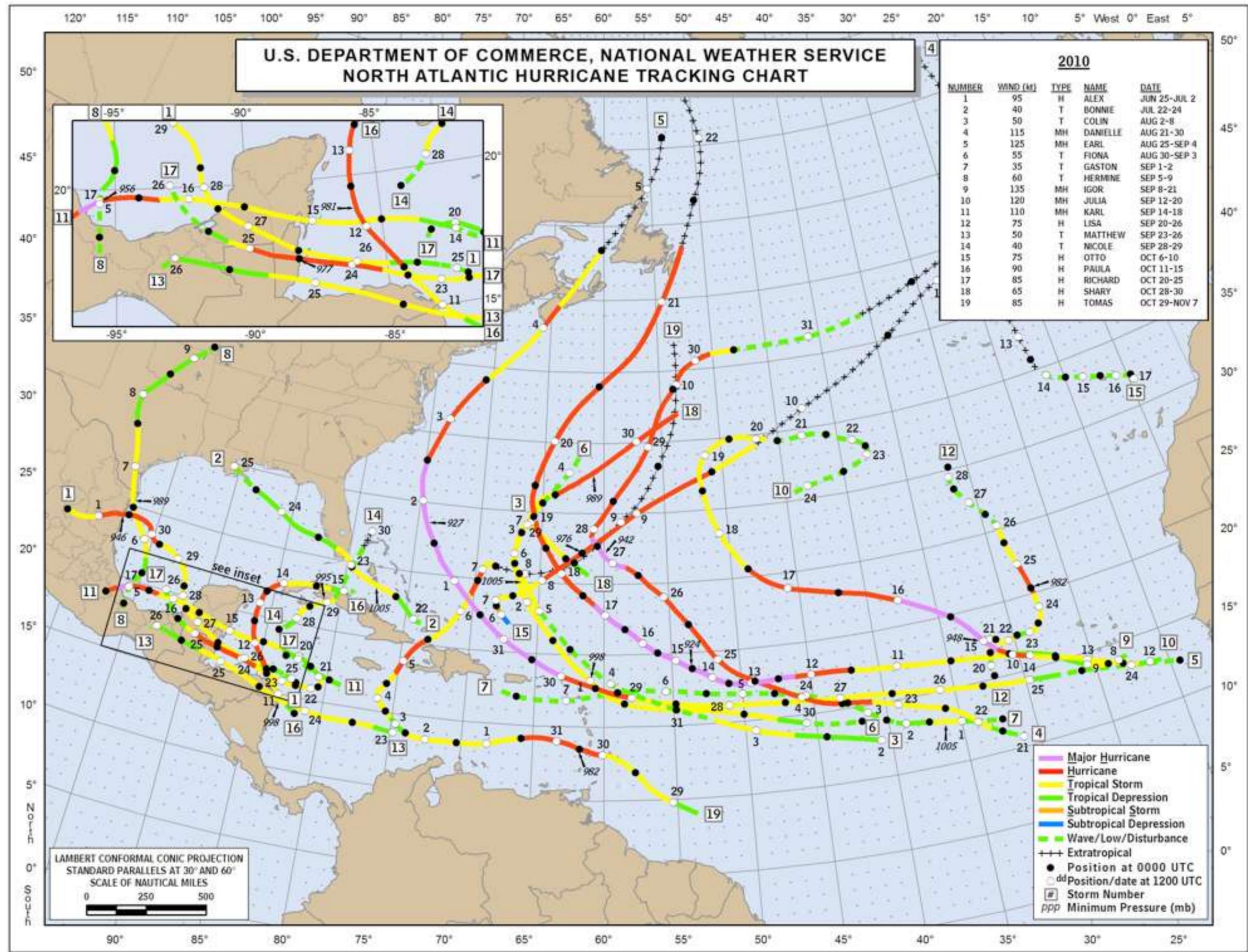




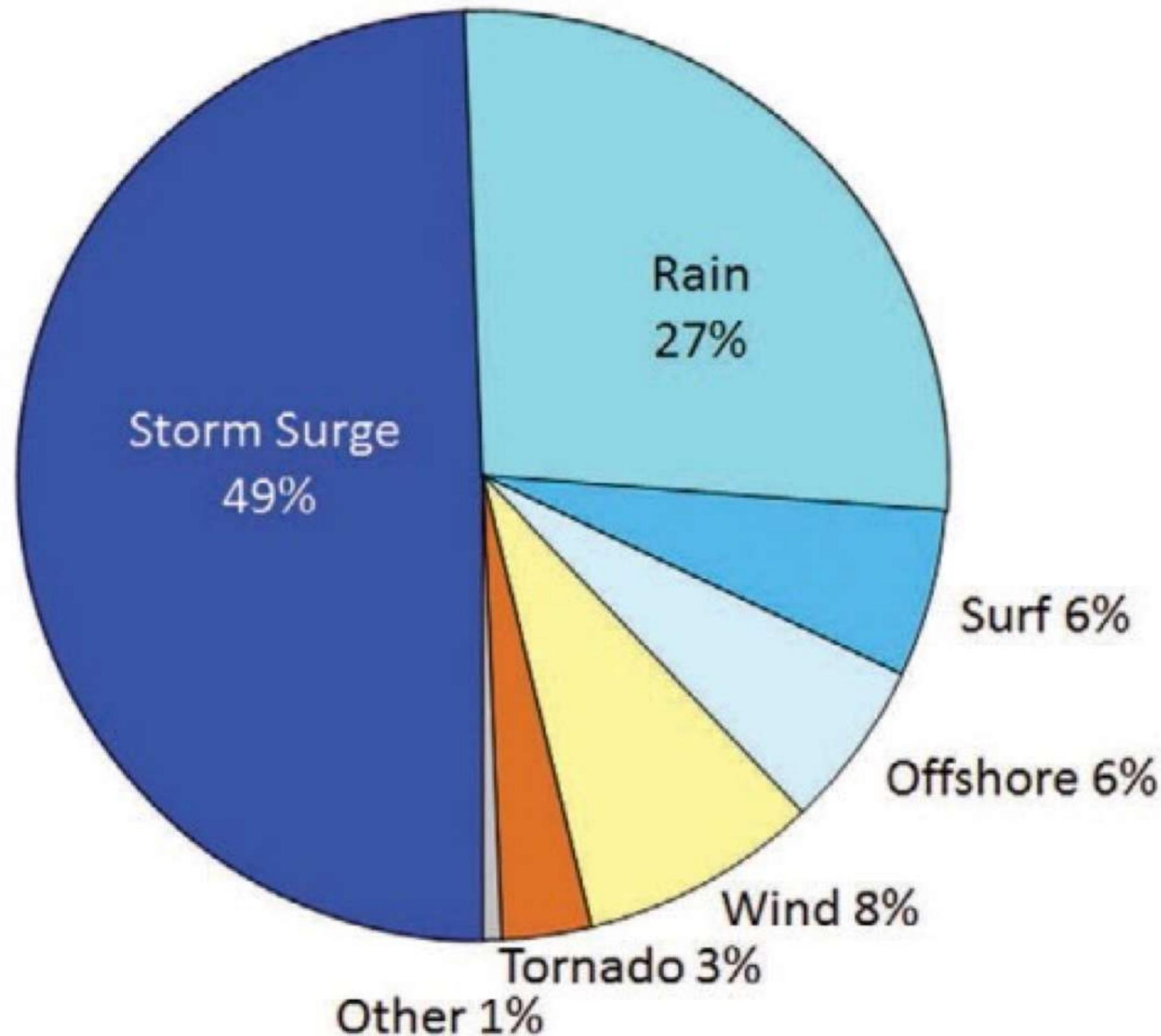
Hurricane Andrew 1992

26 U. S. fatalities, \$58B U. S. damages (adjusted to 2010)





Causes of death
directly attributable
to Atlantic tropical
cyclones
1963-2012

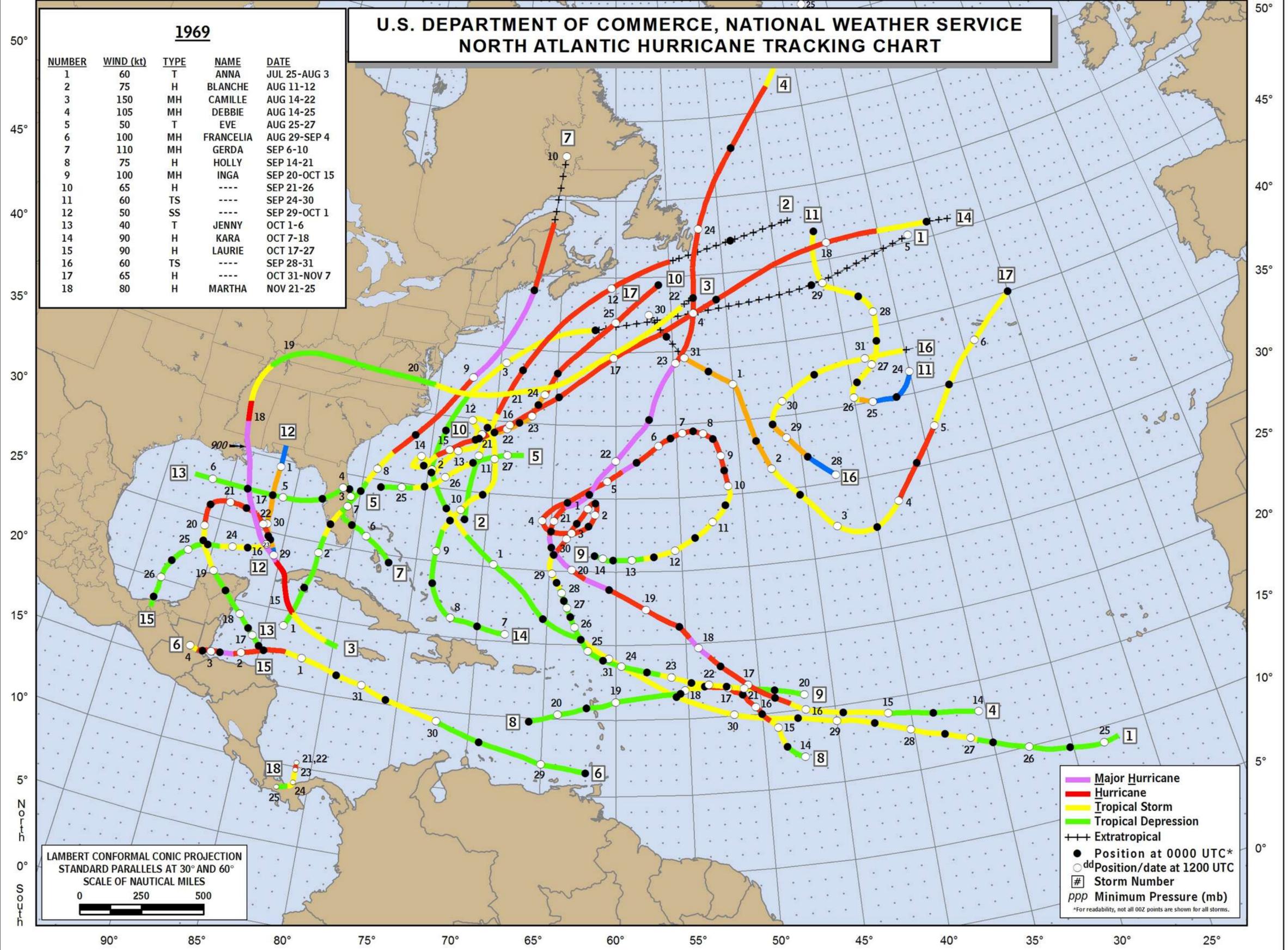


120° 115° 110° 105° 100° 95° 90° 85° 80° 75° 70° 65° 60° 55° 50° 45° 40° 35° 30° 25° 20° 15° 10° 5° West 0° East 5°

**U.S. DEPARTMENT OF COMMERCE, NATIONAL WEATHER SERVICE
NORTH ATLANTIC HURRICANE TRACKING CHART**

1969

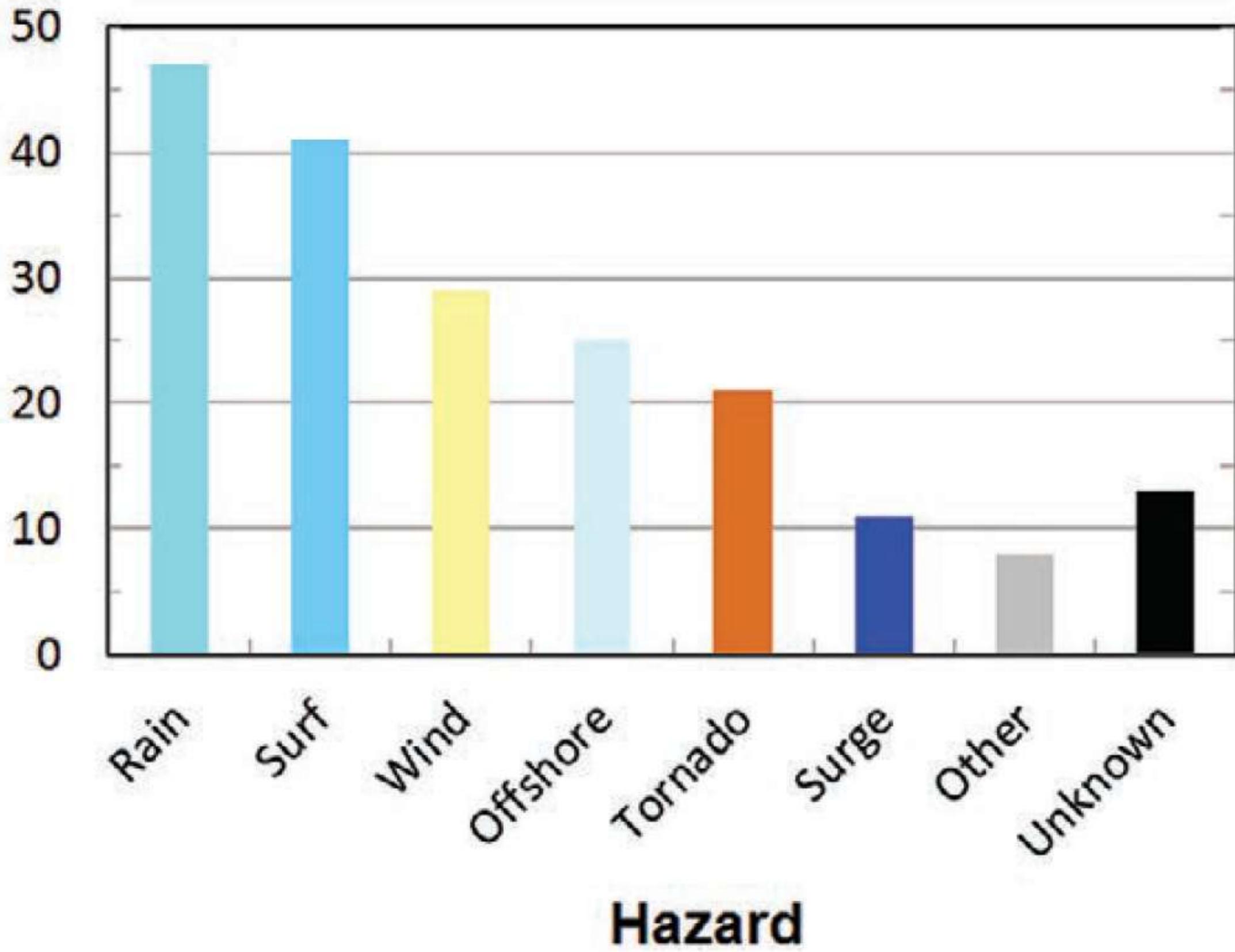
NUMBER	WIND (kt)	TYPE	NAME	DATE
1	60	T	ANNA	JUL 25-AUG 3
2	75	H	BLANCHE	AUG 11-12
3	150	MH	CAMILLE	AUG 14-22
4	105	MH	DEBBIE	AUG 14-25
5	50	T	EVE	AUG 25-27
6	100	MH	FRANCELIA	AUG 29-SEP 4
7	110	MH	GERDA	SEP 6-10
8	75	H	HOLLY	SEP 14-21
9	100	MH	INGA	SEP 20-OCT 15
10	65	H	----	SEP 21-26
11	60	TS	----	SEP 24-30
12	50	SS	----	SEP 29-OCT 1
13	40	T	JENNY	OCT 1-6
14	90	H	KARA	OCT 7-18
15	90	H	LAURIE	OCT 17-27
16	60	TS	----	SEP 28-31
17	65	H	----	OCT 31-NOV 7
18	80	H	MARTHA	NOV 21-25



LAMBERT CONFORMAL CONIC PROJECTION
STANDARD PARALLELS AT 30° AND 60°
SCALE OF NAUTICAL MILES
0 250 500

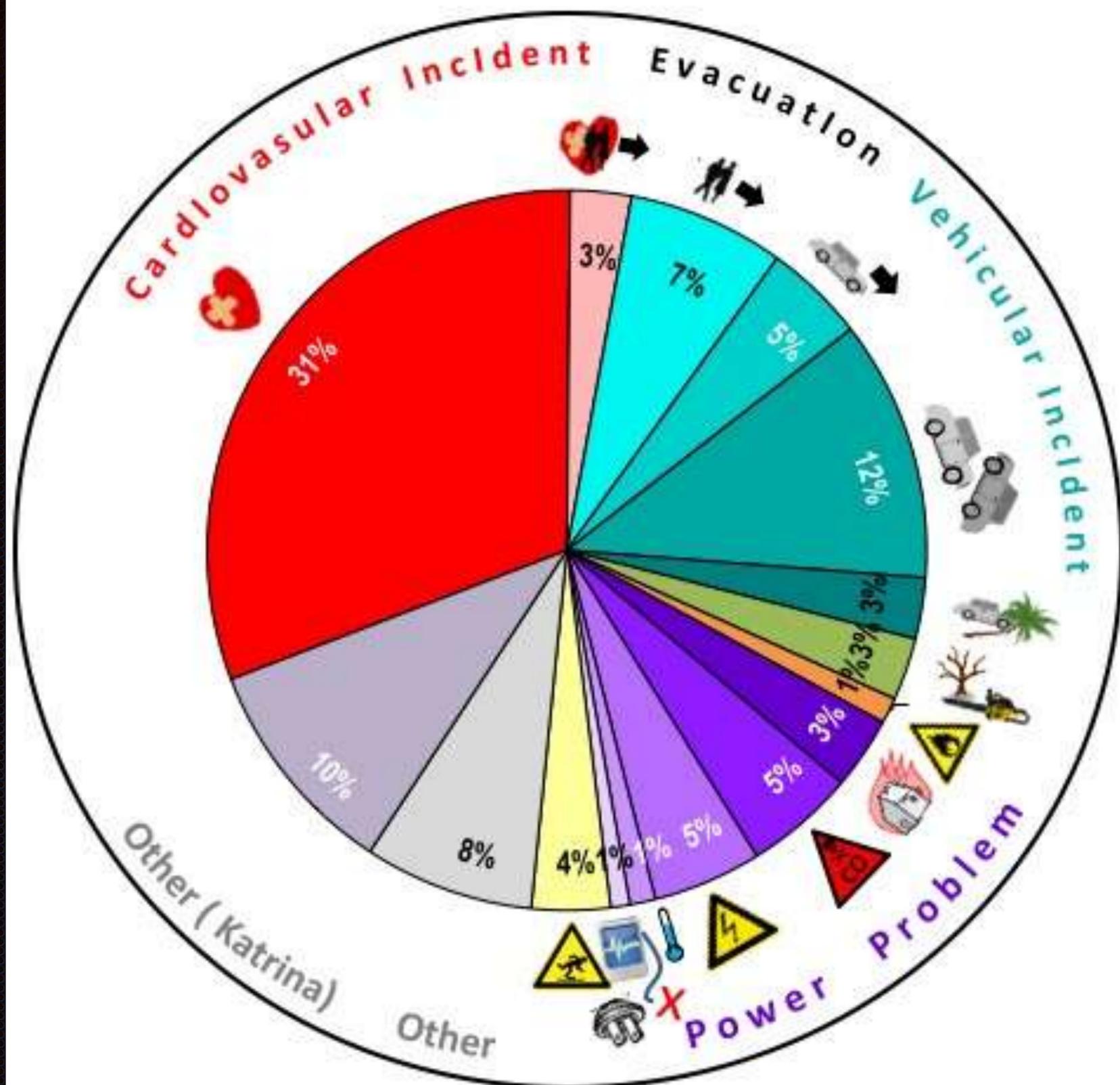
— Major Hurricane
— Hurricane
— Tropical Storm
— Tropical Depression
 --- Extratropical
 ● Position at 0000 UTC*
 ○ Position/date at 1200 UTC
 # Storm Number
 ppp Minimum Pressure (mb)
*For readability, not all 00Z points are shown for all storms.

**Percent Occurrence
In Deadly U.S.
Tropical Cyclones**



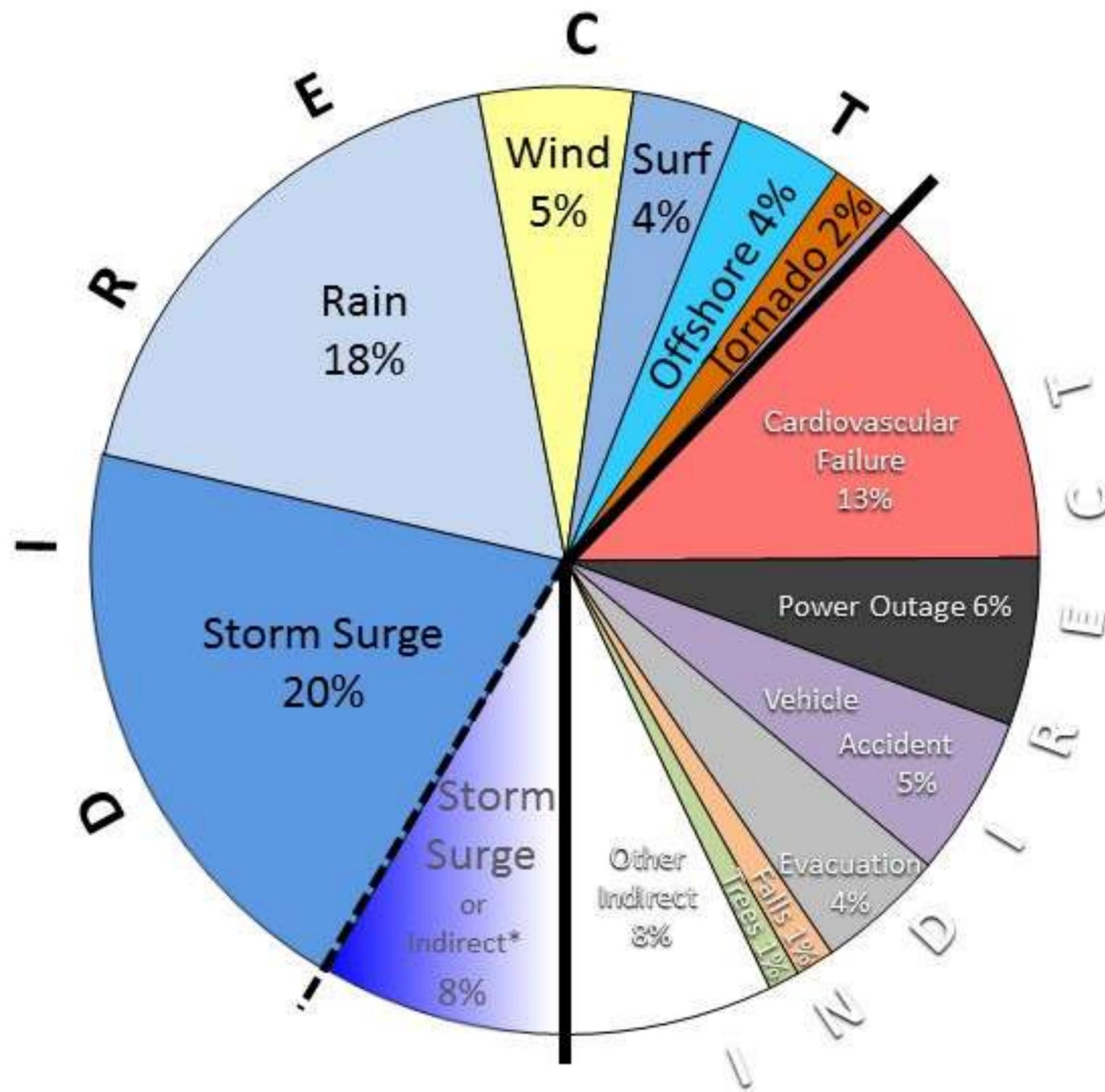
**Percent Occurrence
In All Atlantic
Tropical Cyclones**

U.S. Atlantic Tropical Cyclone Indirect Deaths, 1963-2012

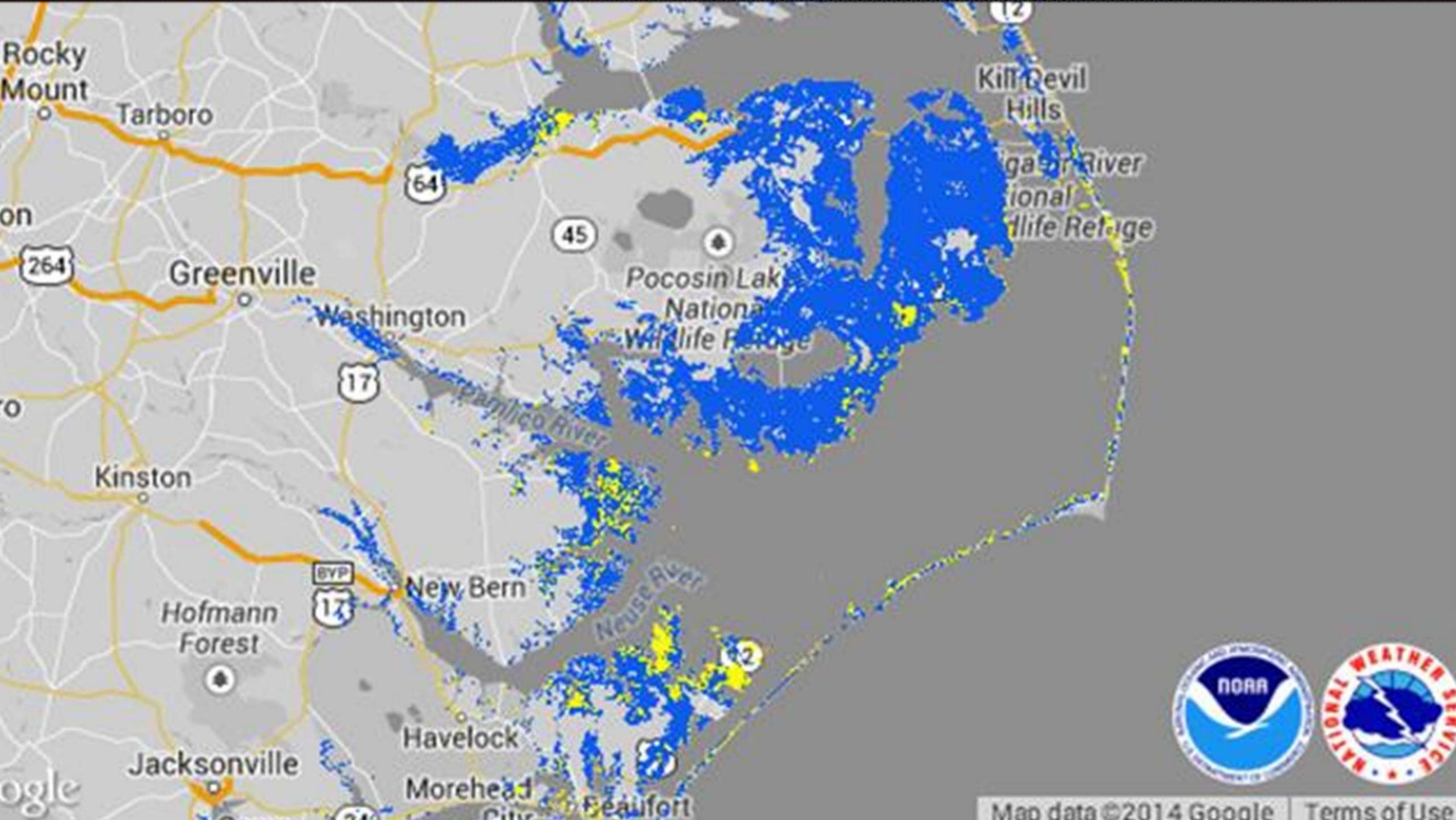


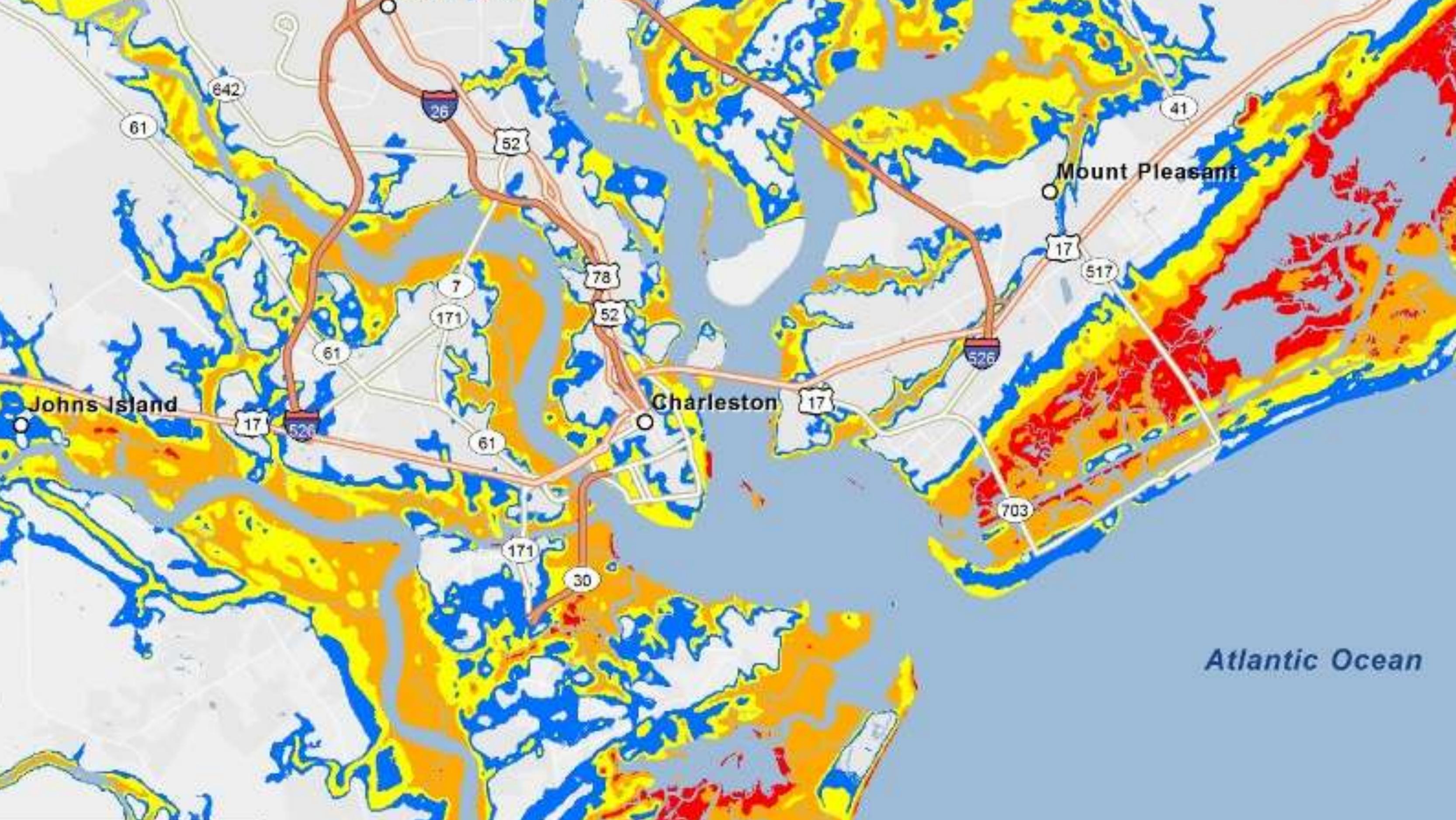
-  Cardiovascular failure
-  Cardiovascular failure of evacuee
-  Evacuation (not with vehicle)
-  Vehicle accident w/evacuation (not with tree)
-  Vehicle accident (not w/evacuation, not with tree)
-  Vehicle hit downed tree
-  Tree work
-  Fire (not from open flame at residence)
-  Residential fire from open flame
-  Carbon monoxide poisoning
-  Electrocution
-  Hypothermia
-  Medical equipment outage
-  Fall

U.S. Atlantic Tropical Cyclone Direct and Indirect Deaths, 1963-2012



* Indeterminate in Katrina using LA Office of Epidemiology data





Johns Island

Charleston

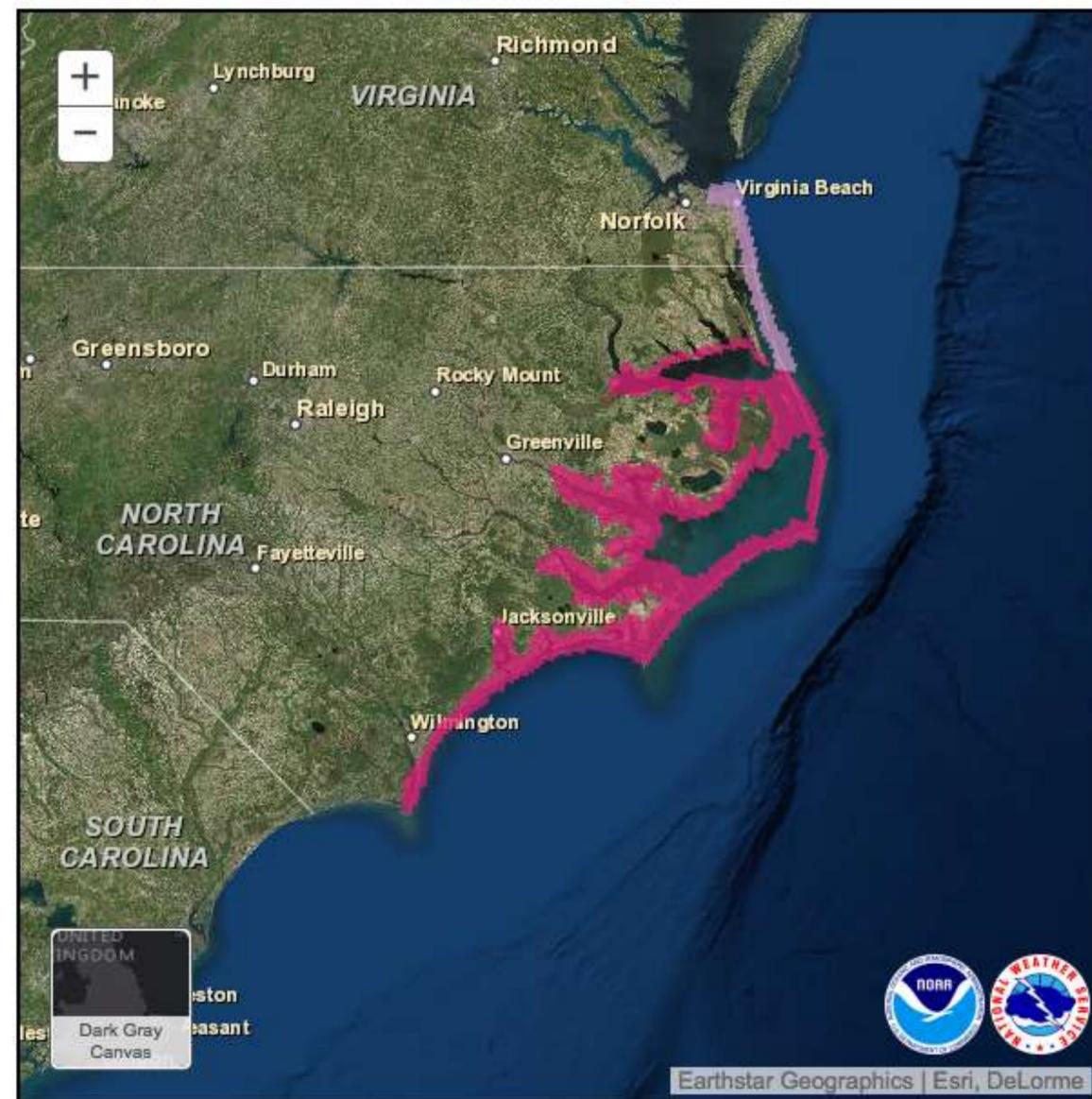
Mount Pleasant

Atlantic Ocean

Prototype Storm Surge Watch/Warning Graphic*

Hurricane Zelda

Advisory 12 Issued: Fri Jul 04 2014 8 PM EDT



0 30 60mi

Prototype Storm Surge Watch/Warning

- Prototype Storm Surge Warning
- Prototype Storm Surge Watch

*Prototype Product - For official NWS tropical cyclone information, see hurricanes.gov. This graphic displays areas that would qualify for inclusion under a storm surge watch/warning that is under development by the National Weather Service. A storm surge warning indicates there is a danger of life-threatening inundation from rising water moving inland from the shoreline somewhere within the specified area, generally within 36 hours. A storm surge watch indicates that life-threatening inundation is possible somewhere within the specified area, generally within 48 hours. All persons, regardless of whether or not they are in the highlighted areas shown in the graphic, should promptly follow evacuation orders and other instructions from local officials. User feedback on the prototype storm surge watch/warning graphic can be provided at [LINK](#). Upon completion of development, formal public comment/review of this graphic and the experimental storm surge watch/warning will take place in 2016, with operational implementation planned in 2017, if approved.

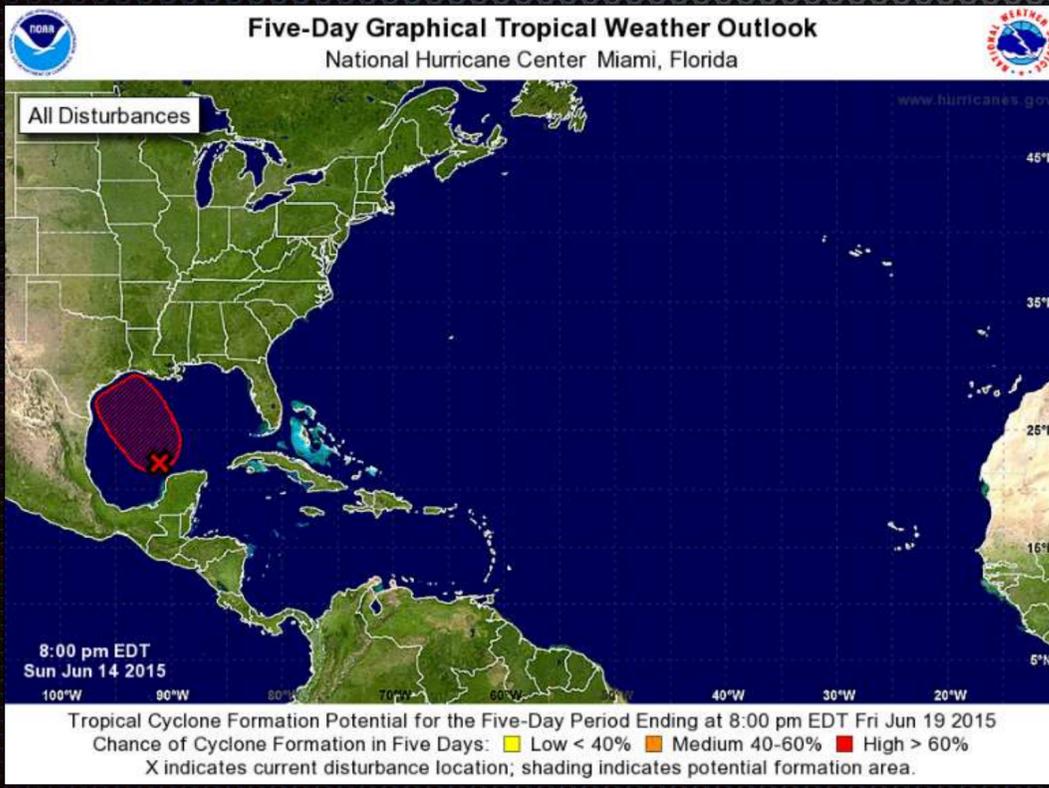
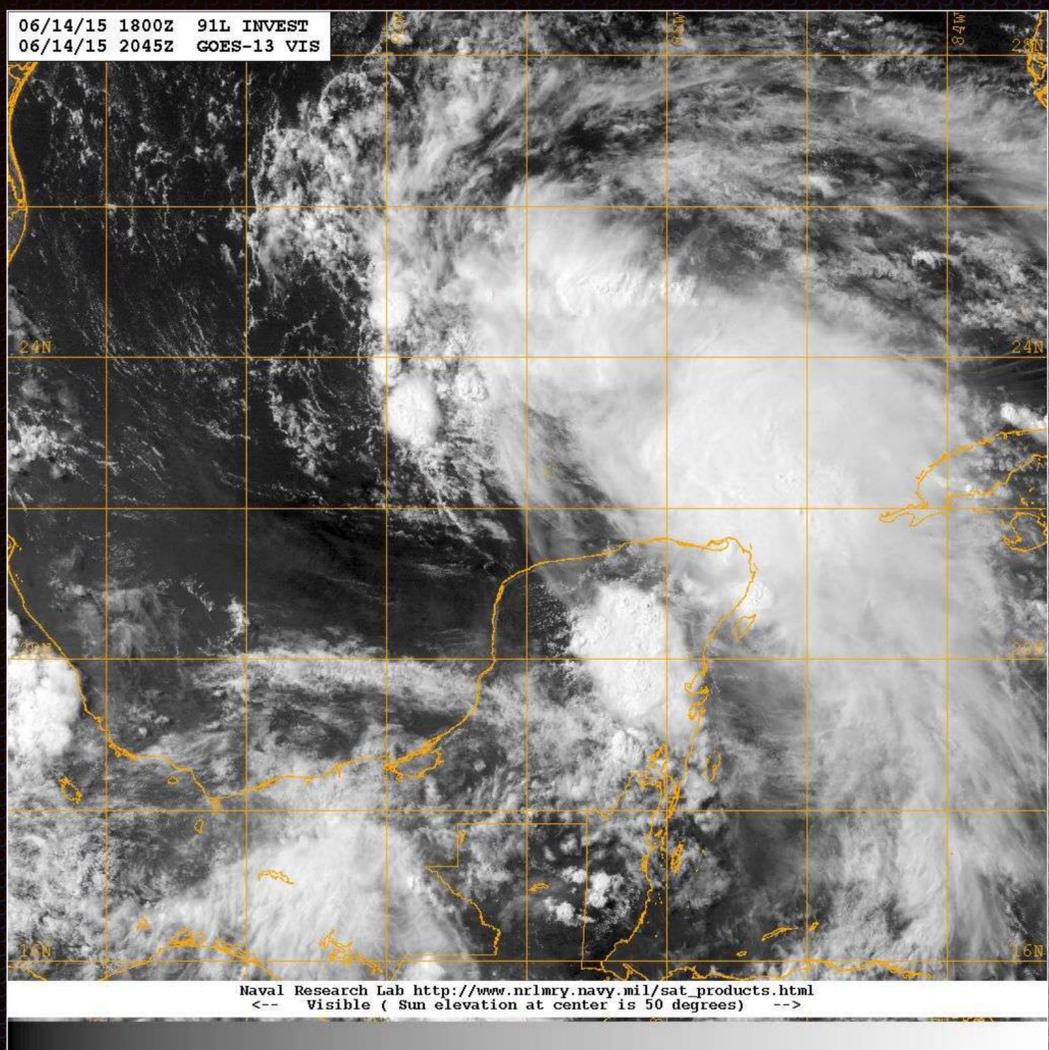


Hurricane Charley

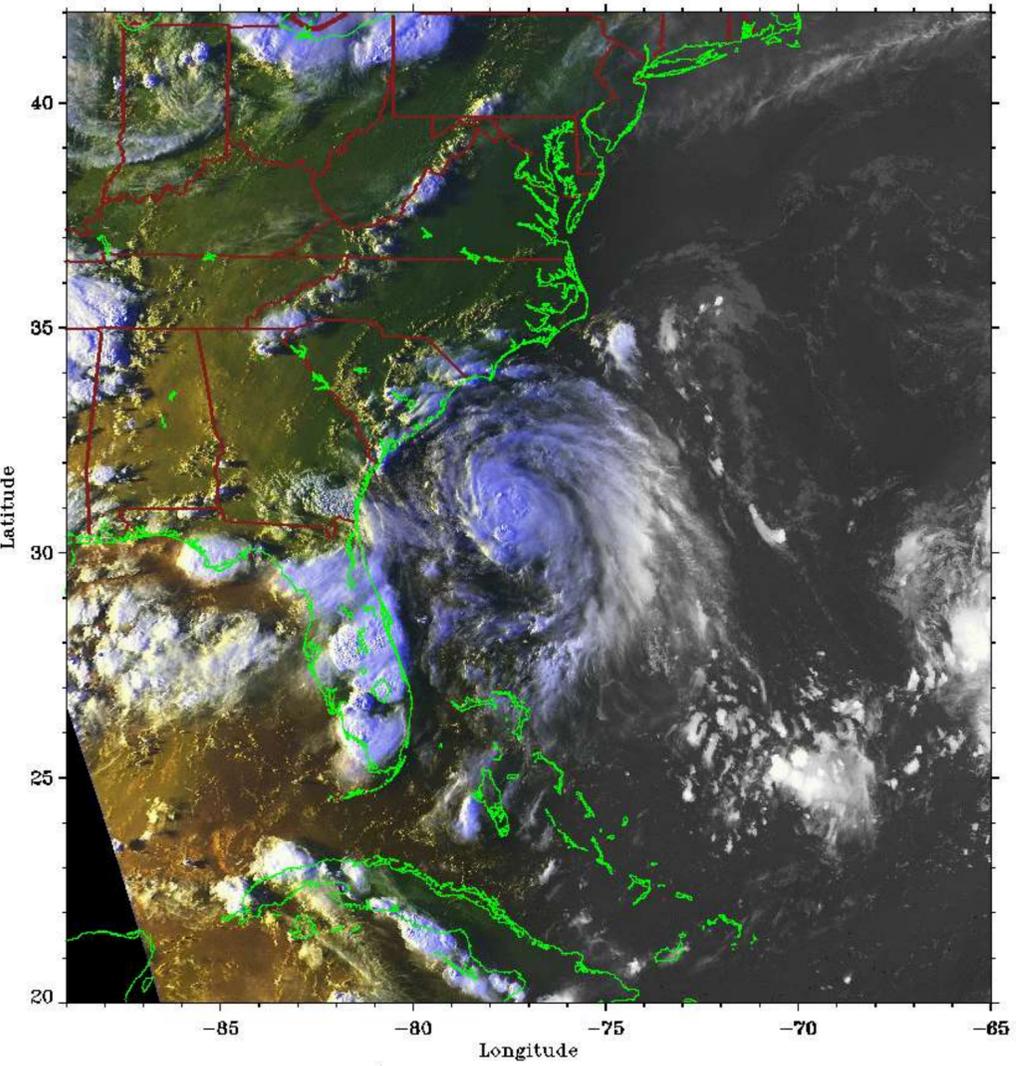


Earliest Reasonable Arrival Time of Sustained Tropical Storm Force (at least 39 mph) Winds

**Thursday August 12, 2004
5 PM EDT Advisory #X**



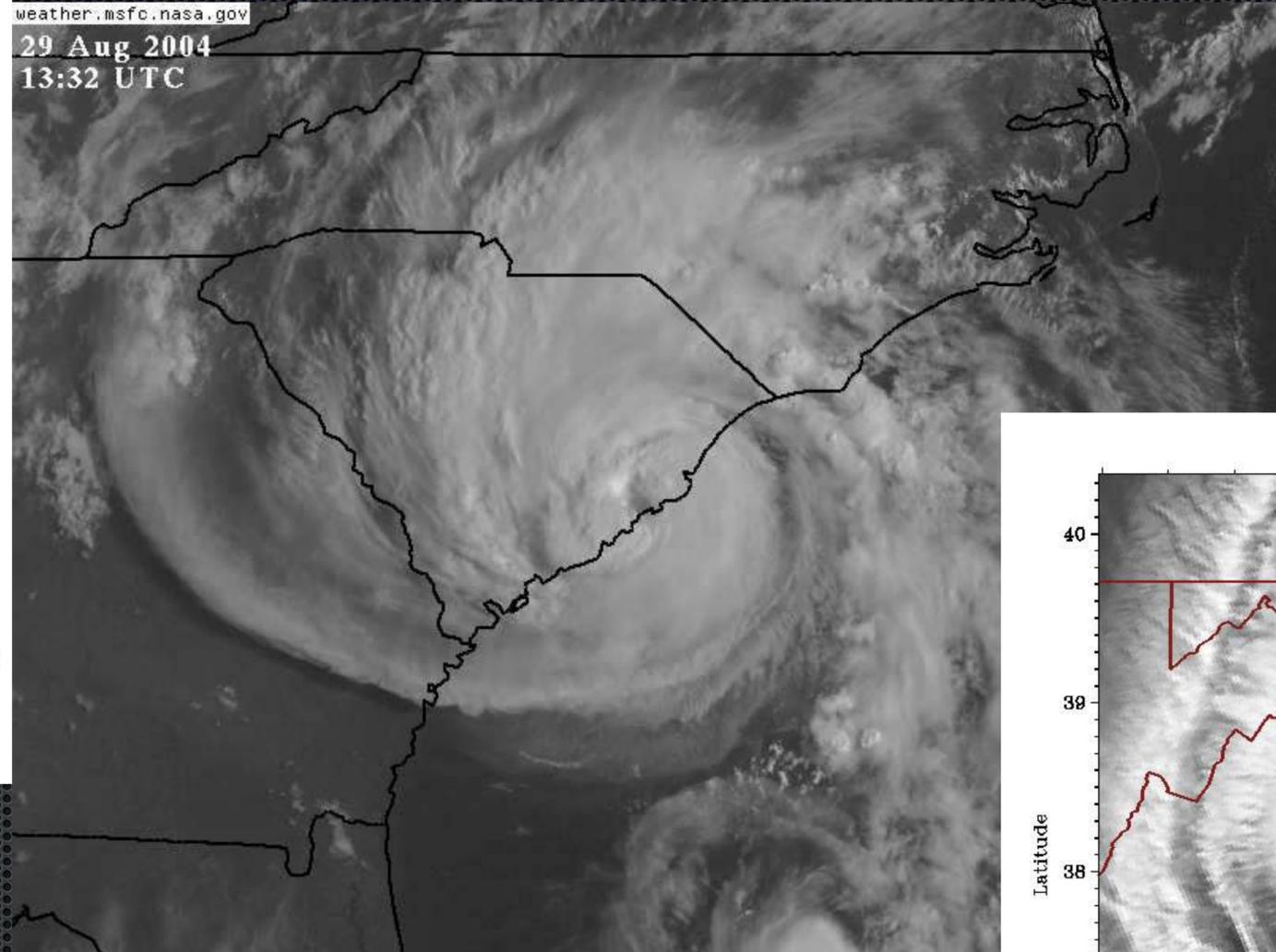
Southeastern United States



AVHRR 3 Channel Color Composite
NOAA-15 AVHRR 2004 Aug 27 22:58 UT
Daytime: R=C1 G=C2 B=-C4, Nighttime: -C4

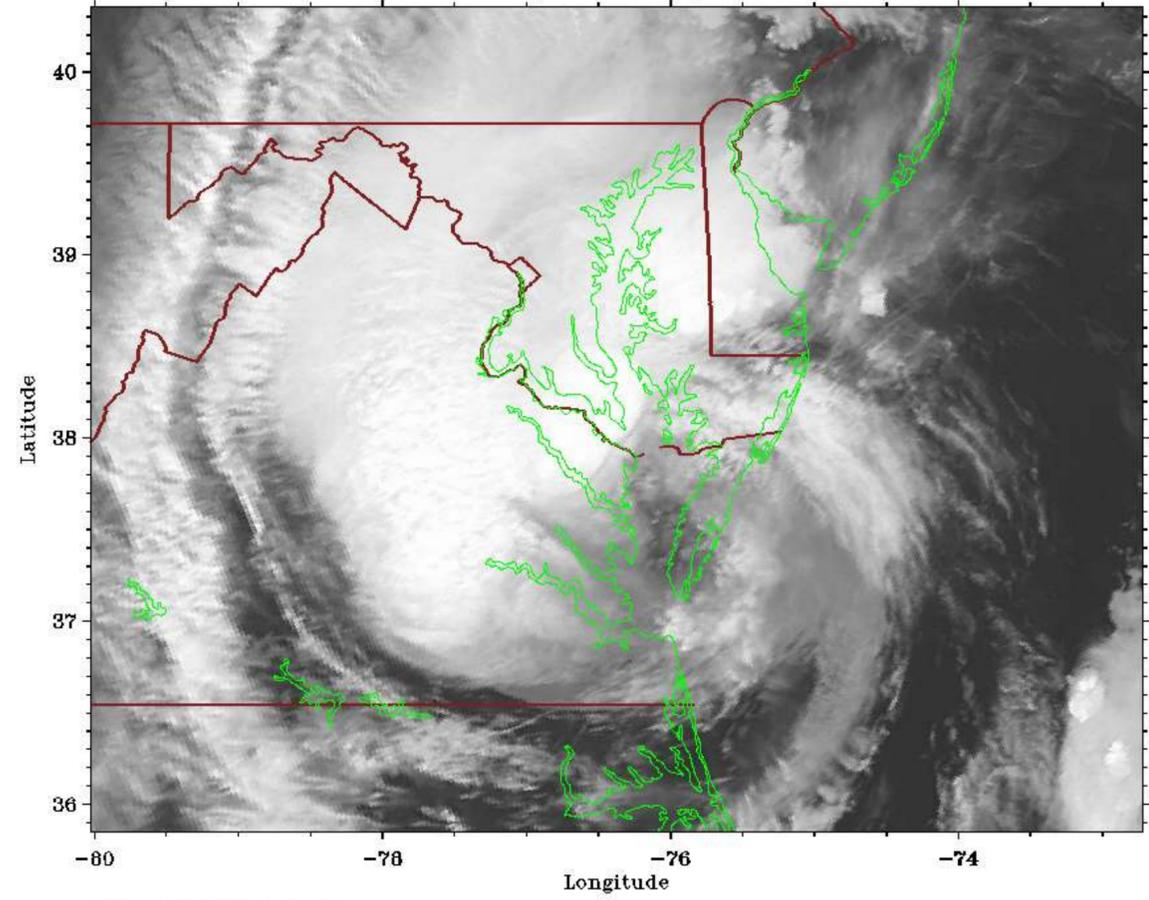
Copyright © 2004 by the Ocean Remote Sensing Group, Johns Hopkins University Applied Physics Laboratory, 23:19:13

Gaston 2004



weather.msfc.nasa.gov
29 Aug 2004
13:32 UTC

Chesapeake Bay Area



AVHRR Channel 4 image
NOAA-17 AVHRR 2004 Aug 31 02:13 UT
Nighttime: -C4

Copyright © 2004 by the Ocean Remote Sensing Group, Johns Hopkins University Applied Physics Laboratory, 02:33:23

Operational Feeds

@NHC_Atlantic

@NHC_Pacific

@NHC_TAFB



NHC Atlantic Ops @NHC_Atlantic · 17h

Tropical Storm #Bill advisory 1 issued.
Tropical storm warning issued as tropical storm #Bill forms go.usa.gov/W3H

← ↻ 399 ★ 120 ⋮



NHC Atlantic Ops @NHC_Atlantic · 17h

NHC is initiating advisories on Tropical Storm Bill and expects to release the advisory in the next 20 minutes.

← ↻ 448 ★ 158 ⋮



NHC Atlantic Ops @NHC_Atlantic · 23h

NHC is not planning to initiate advisories on the system in the Gulf of Mexico at 5 PM. Next aircraft will be in the system before 8 PM.

← ↻ 133 ★ 45 ⋮



NHC Atlantic Ops @NHC_Atlantic · Jun 15

Gulf low very likely to become a tropical storm this afternoon or this evening as it continues moving northwest.

hurricanes.gov

Interactive Outreach

@NWSNHC
@NHCDirector
@NHC_Surge



Natl Hurricane Ctr @NWSNHC · 4h

A tropical cyclone landfall occurs when the center intersects the coastline. hurricanes.gov

8 4



Natl Hurricane Ctr @NWSNHC · 4h

Bill about to make landfall, centered at 10 a.m CDT about 15 mi south of Port O'Connor TX. hurricanes.gov



122 23

View photo



Natl Hurricane Ctr @NWSNHC · 6h

Inland flooding 2nd only to storm surge in tropical cyclone deaths. High flood risk with Bill. hurricanes.gov



Key Messages on Hurricane Joaquin

Wednesday Evening, September 30, 2015



- 1. Preparations to protect life and property within the warning areas in the Bahamas should be rushed to completion.**
- 2. A significant adjustment to the forecast has been made this afternoon to reflect an increased threat to the mid-Atlantic states and the Carolinas.** However, confidence in the details of the forecast after 72 hours remains low, since we have one normally excellent model that keeps Joaquin far away from the United States east coast. The range of possible outcomes is still large, and includes the possibility of a major hurricane landfall in the Carolinas.
- 3. Every effort is being made to provide the forecast models with as much data as possible.** The NOAA G-IV jet has begun a series of missions in the storm environment, and the National Weather Service has begun launching extra balloon soundings.
- 4. Because landfall, if it occurs, is still more than three days away, it's too early to talk about specific wind, rain, or surge impacts from Joaquin in the United States.** Regardless of Joaquin's track, strong onshore winds will create minor to moderate coastal flooding along the coasts of the mid-Atlantic and northeastern states through the weekend.
- 5. A hurricane watch for a portion of the U.S. coast could be required as early as Thursday evening.**
- 6. Many areas of the eastern U.S. are currently experiencing heavy rains and gusty winds associated with a frontal system.** This inclement weather is expected to continue over the next few days, which could complicate preparations for Joaquin should it head toward the coast, and greatly exacerbate the impacts from the hurricane.





Inside the Eye

Official Blog of the National Hurricane Center

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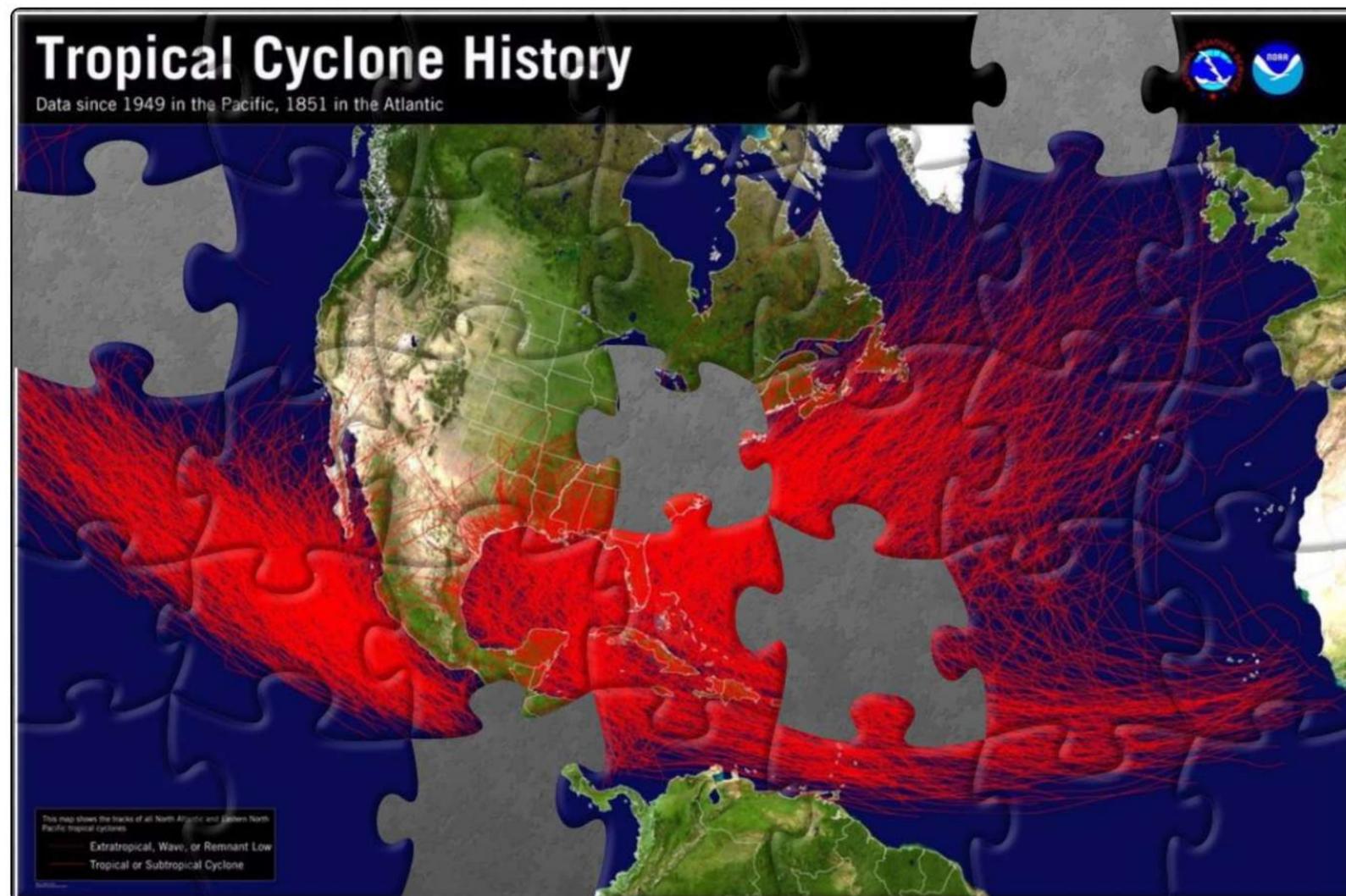
[NHC on Social Media](#)

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[Disclaimer and Privacy](#)

Solving the Jigsaw Puzzle of Hurricane History

POSTED ON FEBRUARY 11, 2016 UPDATED ON FEBRUARY 11, 2016



Start of the Atlantic Hurricane Season

June 1st, 2016

2

months to go.

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Follow

National Hurricane Center

The annual NHC "Update on National Hurricane Center Products and Services" has been issued for

2016

HURRICANE AWARENESS TOUR

5 Cities

5 Days

1,321 Miles











National Hurricane Preparedness Week

May 15-21, 2016

Sunday

Determine your risk

Monday

Plan for evacuation

Tuesday

Shop for supplies

Wednesday

Update insurance

Thursday

Strengthen your home

Friday

Identify trusted sources of information

Saturday

Complete your written hurricane plan



**#HURRICANE
STRONG™**

Make A Plan



Know your evacuation zone



Have an insurance check-up



Build a disaster supply kit



Strengthen your home



Help your neighbor

AMBASSADOR™



WEATHER-READY NATION