

Hurricanes in Florida



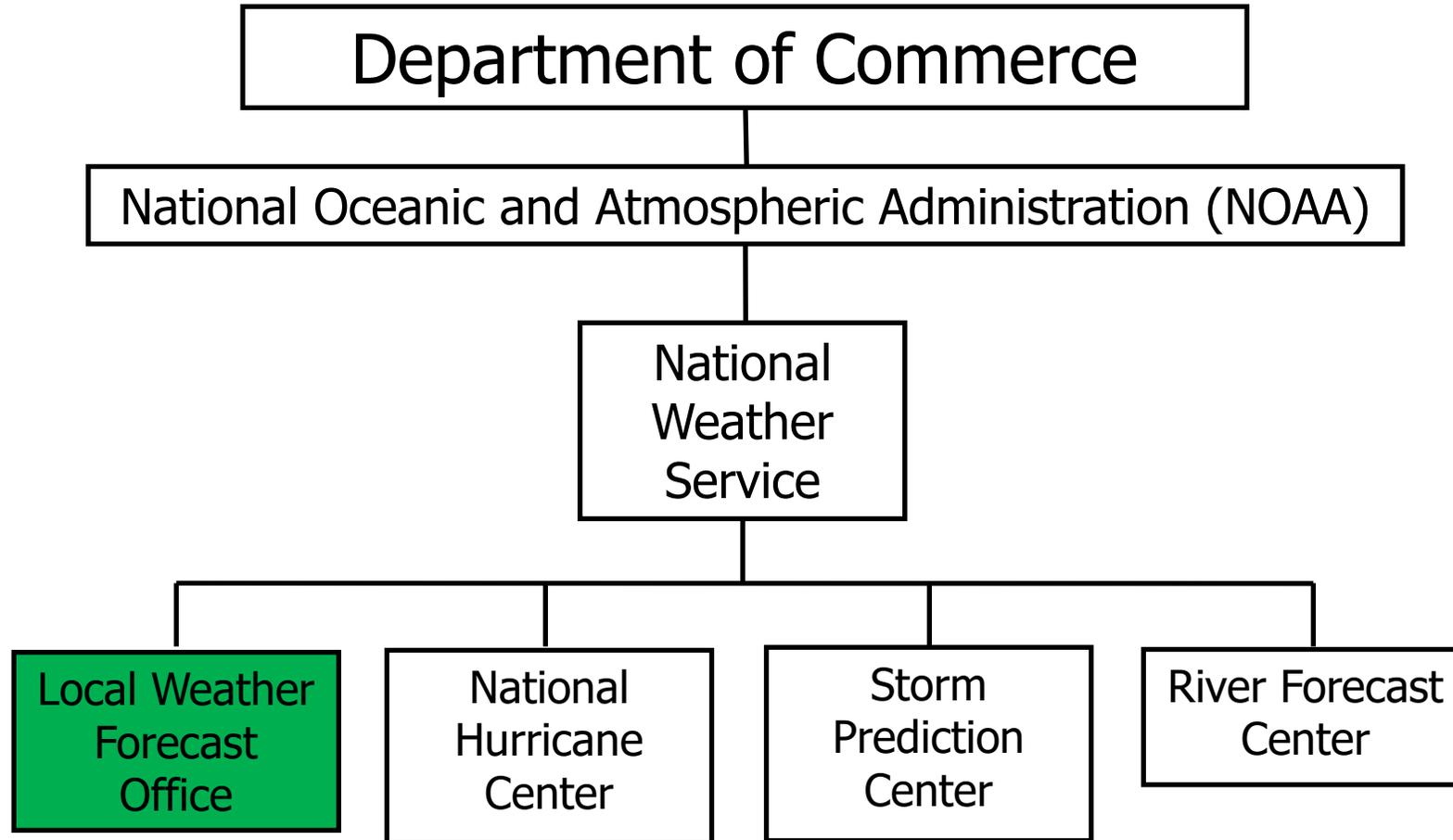
Daniel Noah

Warning Coordination Meteorologist

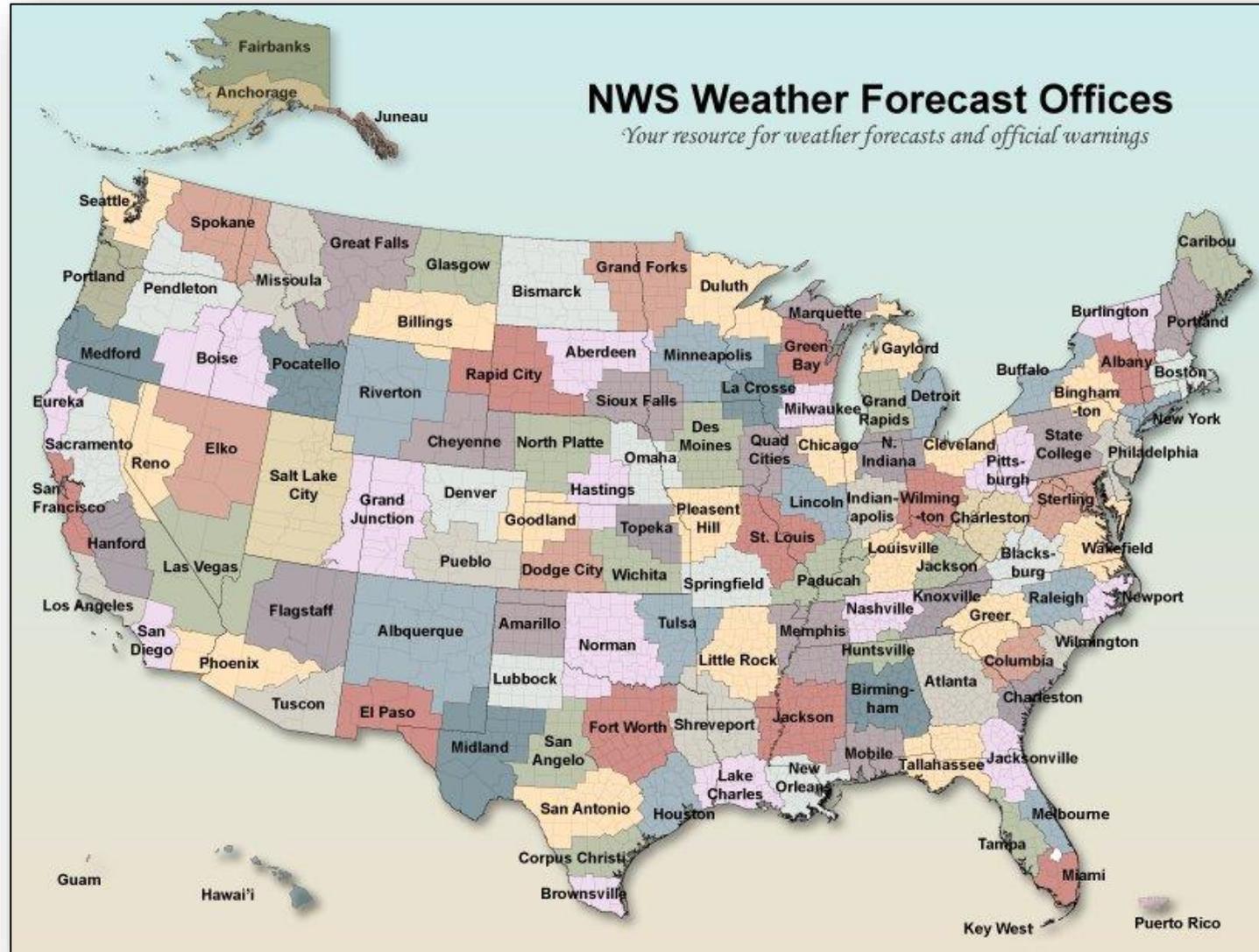
daniel.noah@noaa.gov

<https://weather.gov/tampabay>

We are a Federal Government Agency



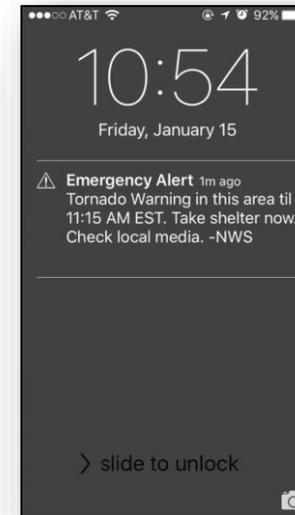
122 NWS Local Weather Forecast Offices



- 23 Employees
- 17 are Meteorologists
- 24 hours a day
- 365 days a year



We Issue the Weather Warnings You Hear on Radio/TV



Members of the Integrated Warning Team



Emergency
Management
and Public
Officials

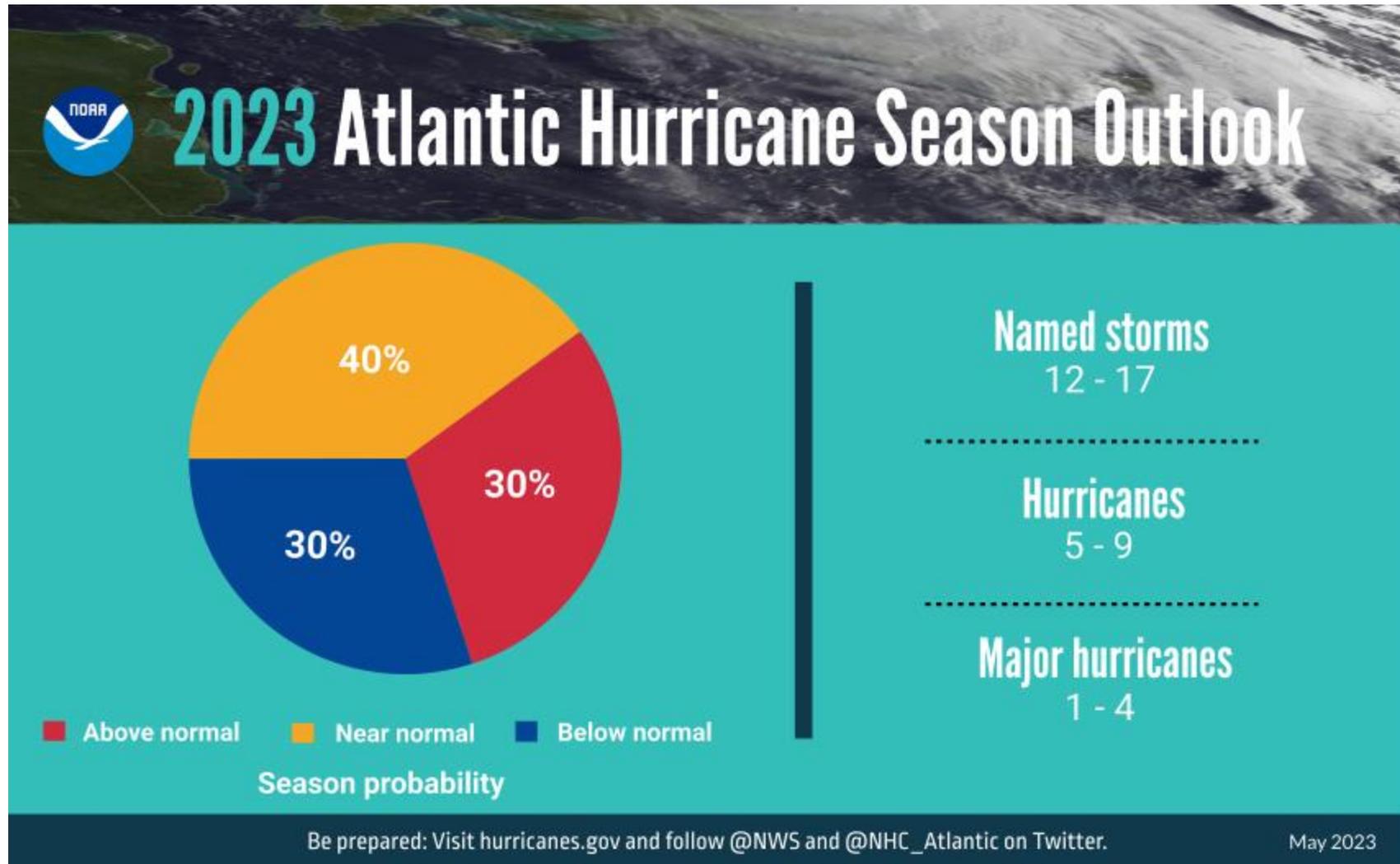


National
Weather
Service



America's Weather
and Climate Industry
(e.g. TV, Radio, Newspaper,
Media, Private Companies,
& App Developers)

2023 Hurricane Season Forecast



Have Multiple Ways to Receive Weather Warnings

Commercial Apps
From your favorite local
TV, Radio, or Newspaper



Search for FEMA
in App Store



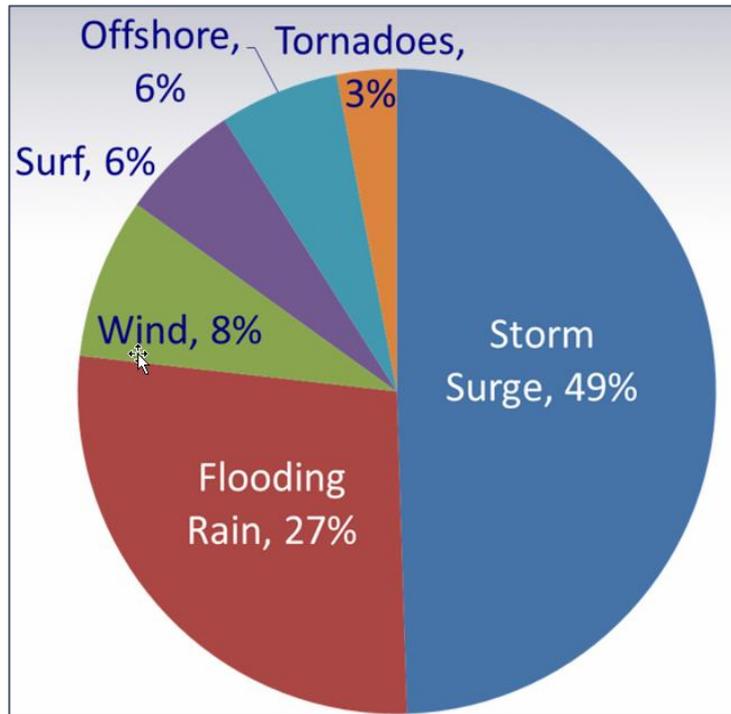
Weather Radio



AlertFlorida.com



When you close your eyes, what do you see when you think of a hurricane?



9 out of 10 U.S. tropical cyclone fatalities are due to water

Hurricane Threats



Storm
Surge



Wind



Flooding
Rain

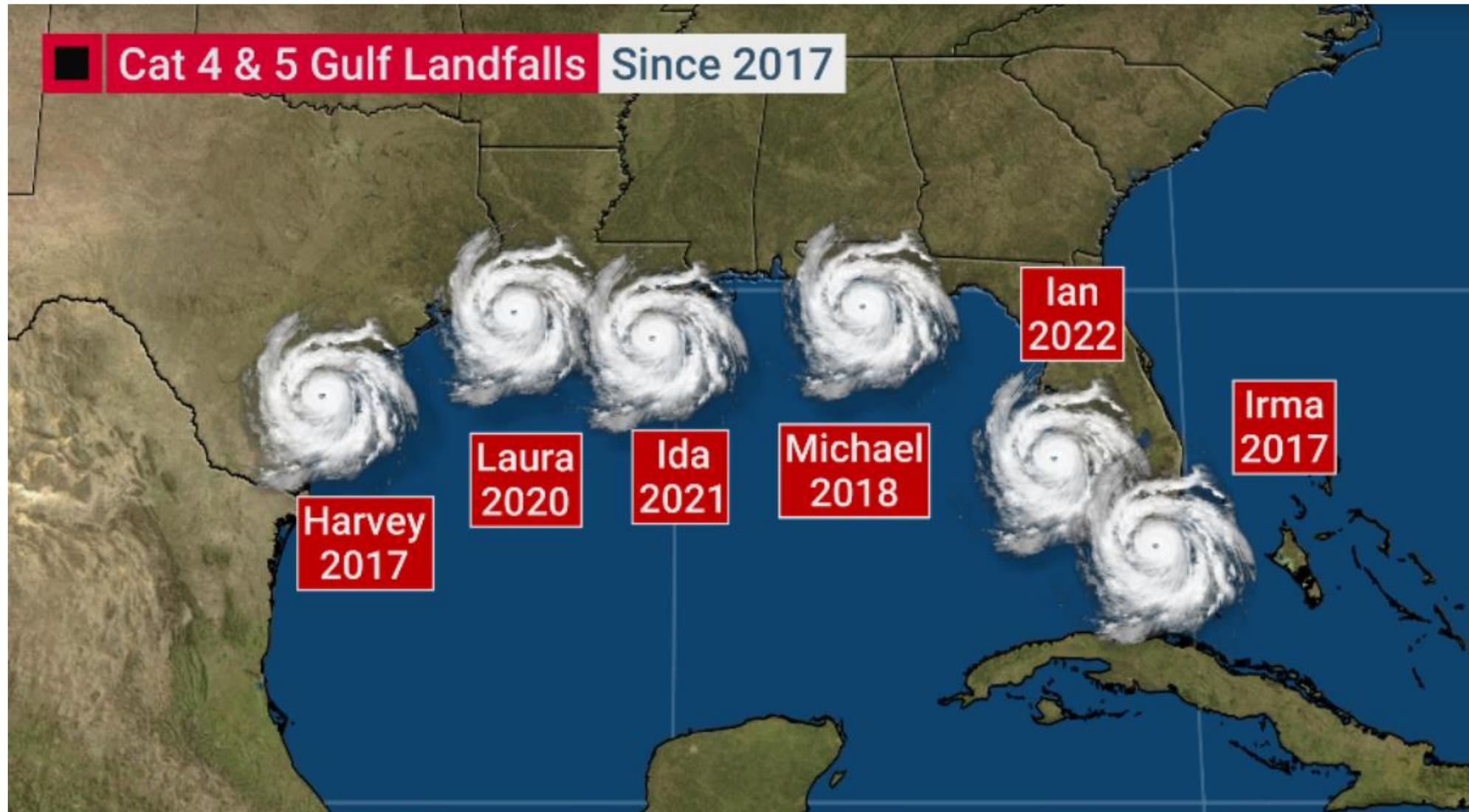


Waves
and Rip
Currents

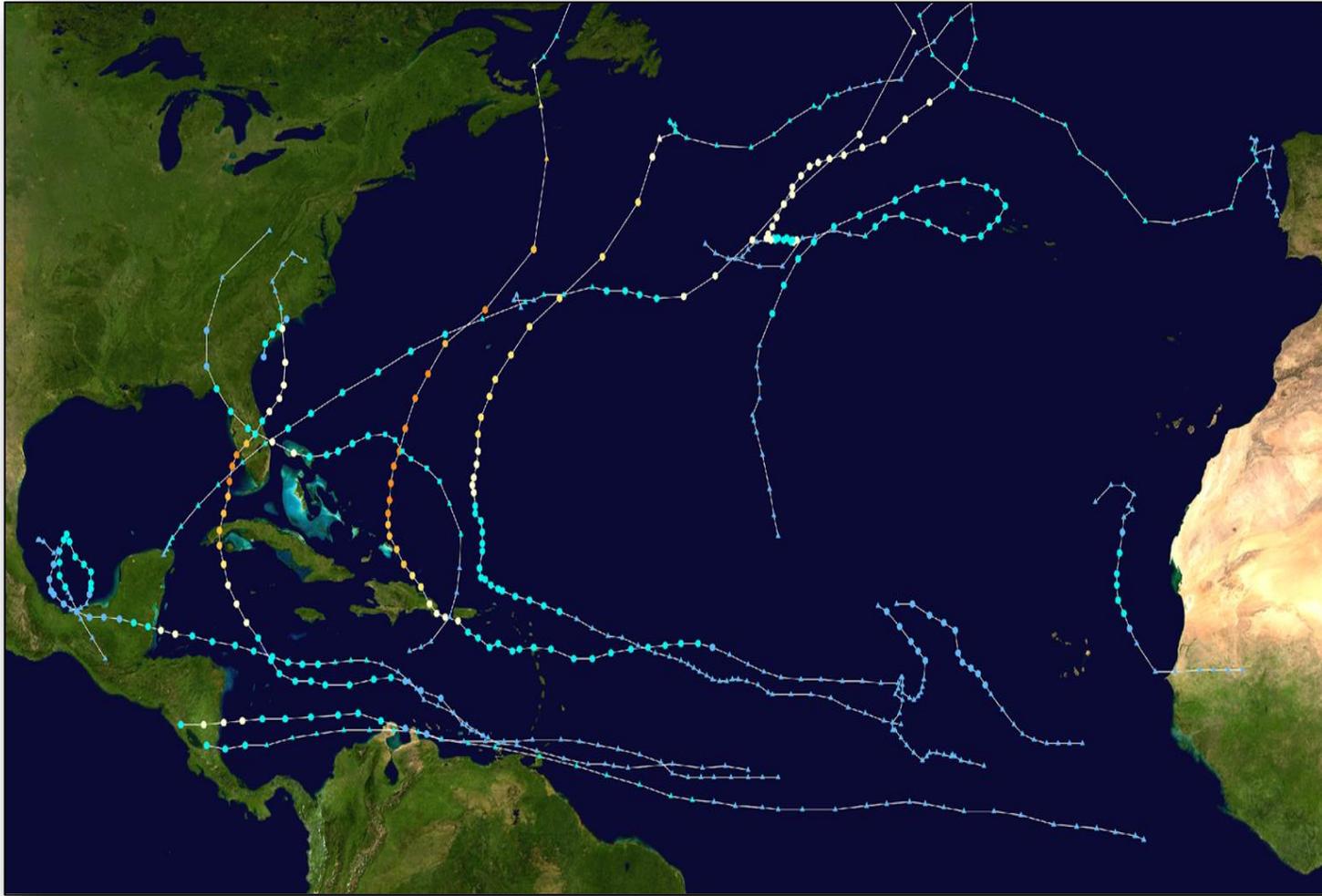


Tornadoes

Gulf of Mexico: Category 4 and 5 Hurricanes Since 2017



2022 Hurricane Season: **It only takes one!**



Season: June 1 – Nov 30

First Storm: June 5 (Alex)

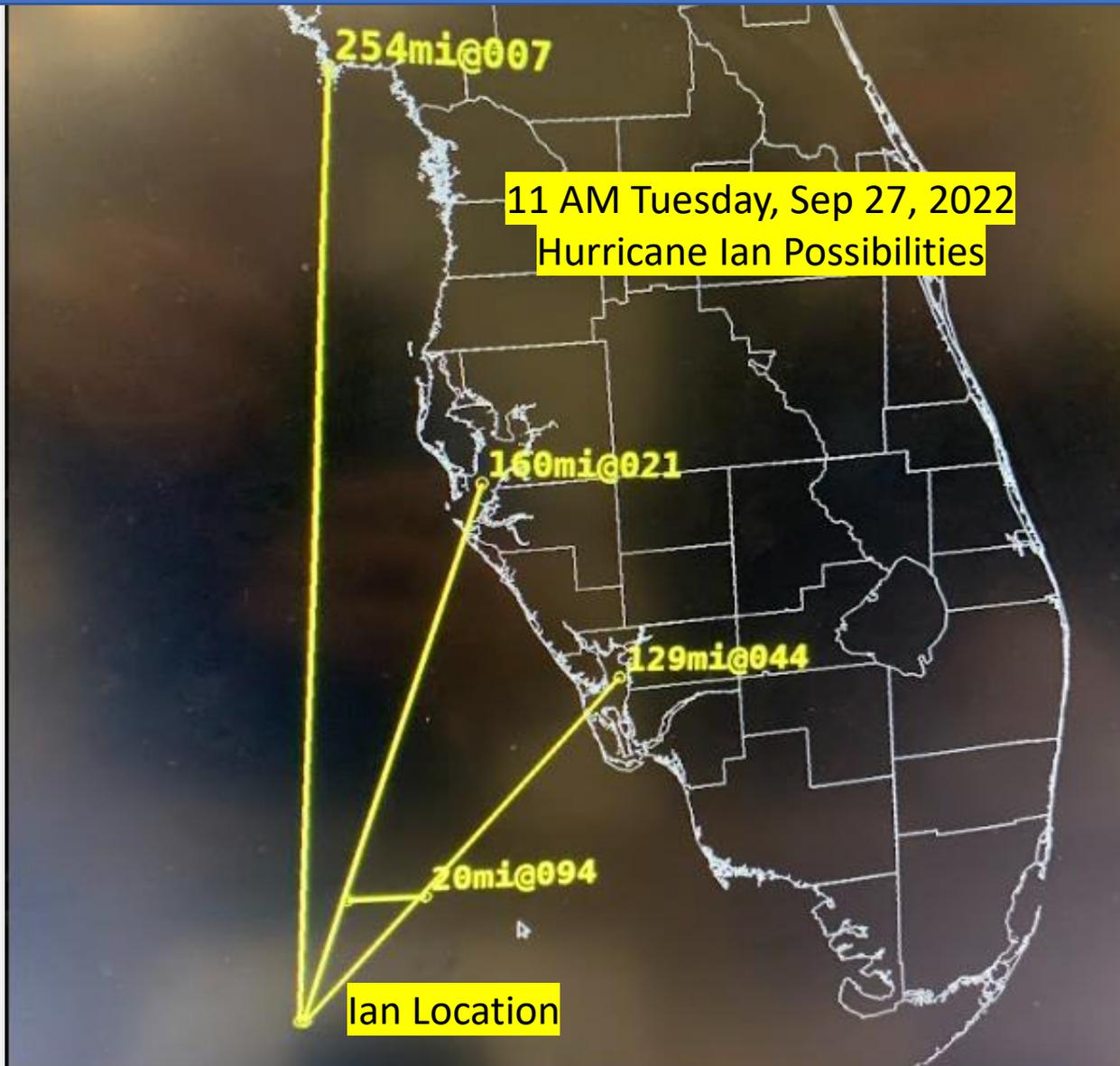
Last Storm: Nov 7 (Nicole)

Significant impacts from
Hurricanes **Ian**, **Fiona**, **Nicole**.

Social Science: Who Evacuates

First Out 21%	Anxious and eager to leave if a hurricane is in the forecast
Constrained 14%	Aware of risks & willing to evacuate but face barriers
Optimists 16%	Doubt that a hurricane will occur but willing to evacuate
Reluctant 27%	Reluctant to evacuate but will leave if ordered to
Diehards 22%	Confident they can safely ride out hurricanes at home

Hurricane Sandy study by Jennifer Marlon, Yale University



Hurricane Ian took about 20 hours for the eyewall to move from Cuba and make landfall Wednesday Afternoon near Punta Gorda in Coya Costa

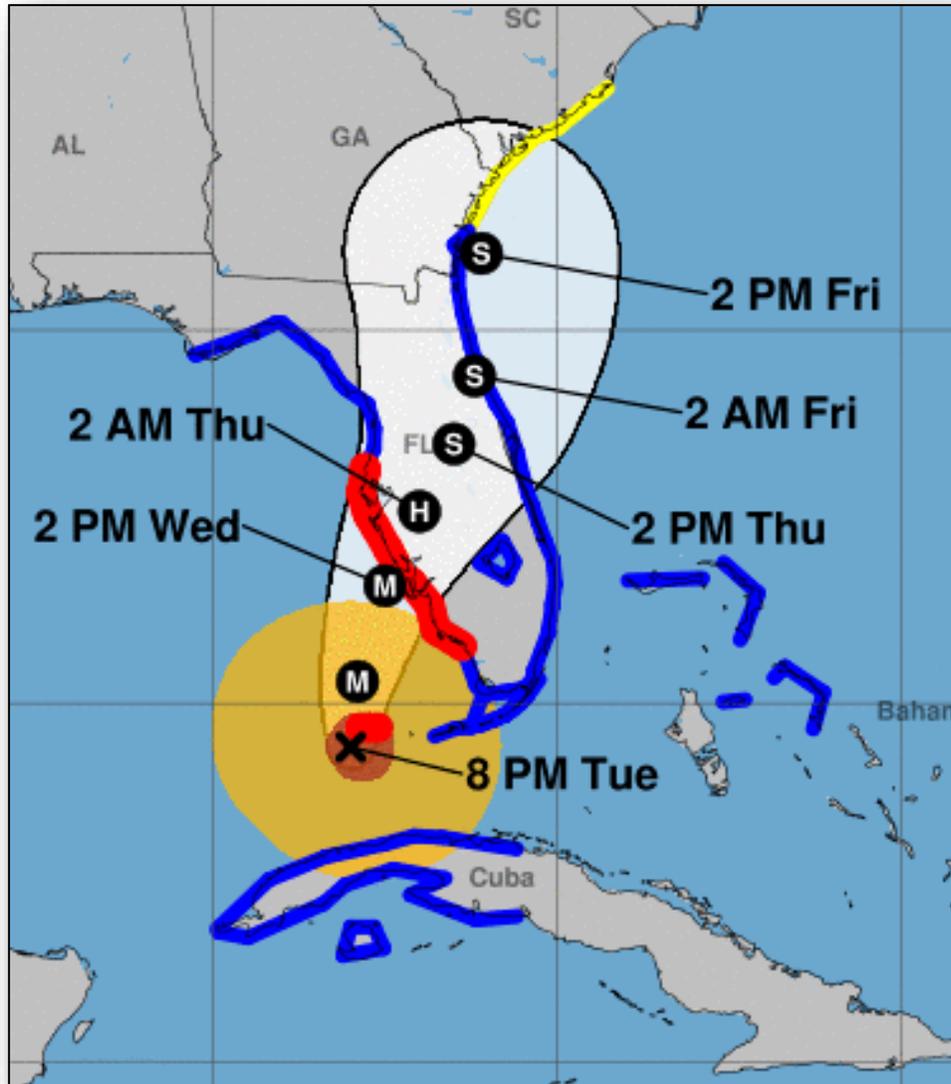
If Ian wobbled west 20 miles:

- Landfall in Tampa Bay in 22 hours
- Storm Surge 5-15 ft from Tampa Bay through Fort Myers
- Highest surge associated with right side of eye wall where winds come onshore

If Hurricane Ian Wobbled West 25 Miles

- Cedar Key landfall in 28 hours

Be Careful with the Forecast Cone vs Impacts



Look how much bigger Ian's wind field was when compared to the cone

Life threatening impacts occur outside the cone

Cone only shows you where center of storm is expected to be



Hurricane Ian – 28 September 2022

1:30 – 4:00 PM EDT



weather.gov/tampa

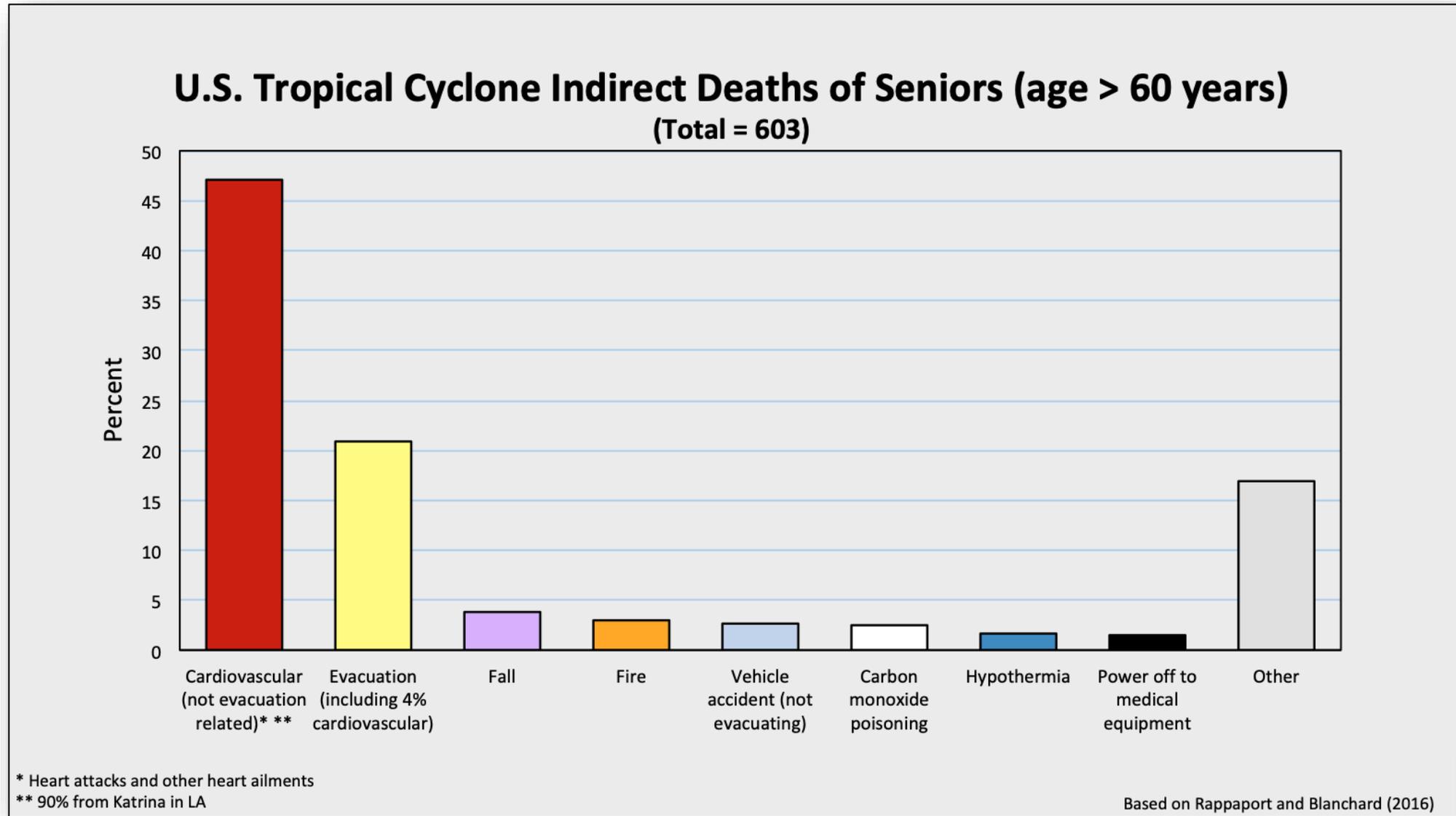


@NWSTampaBay

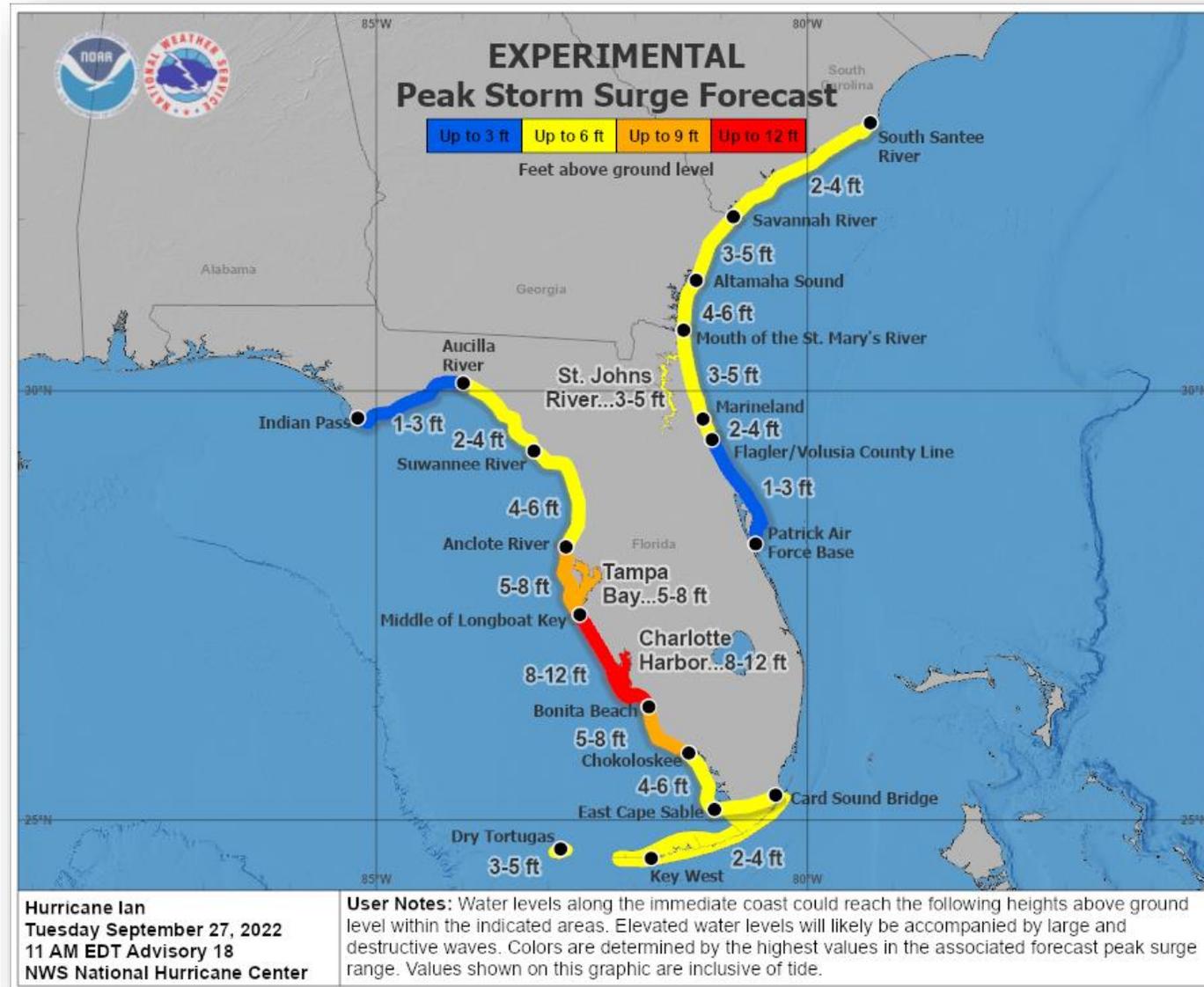


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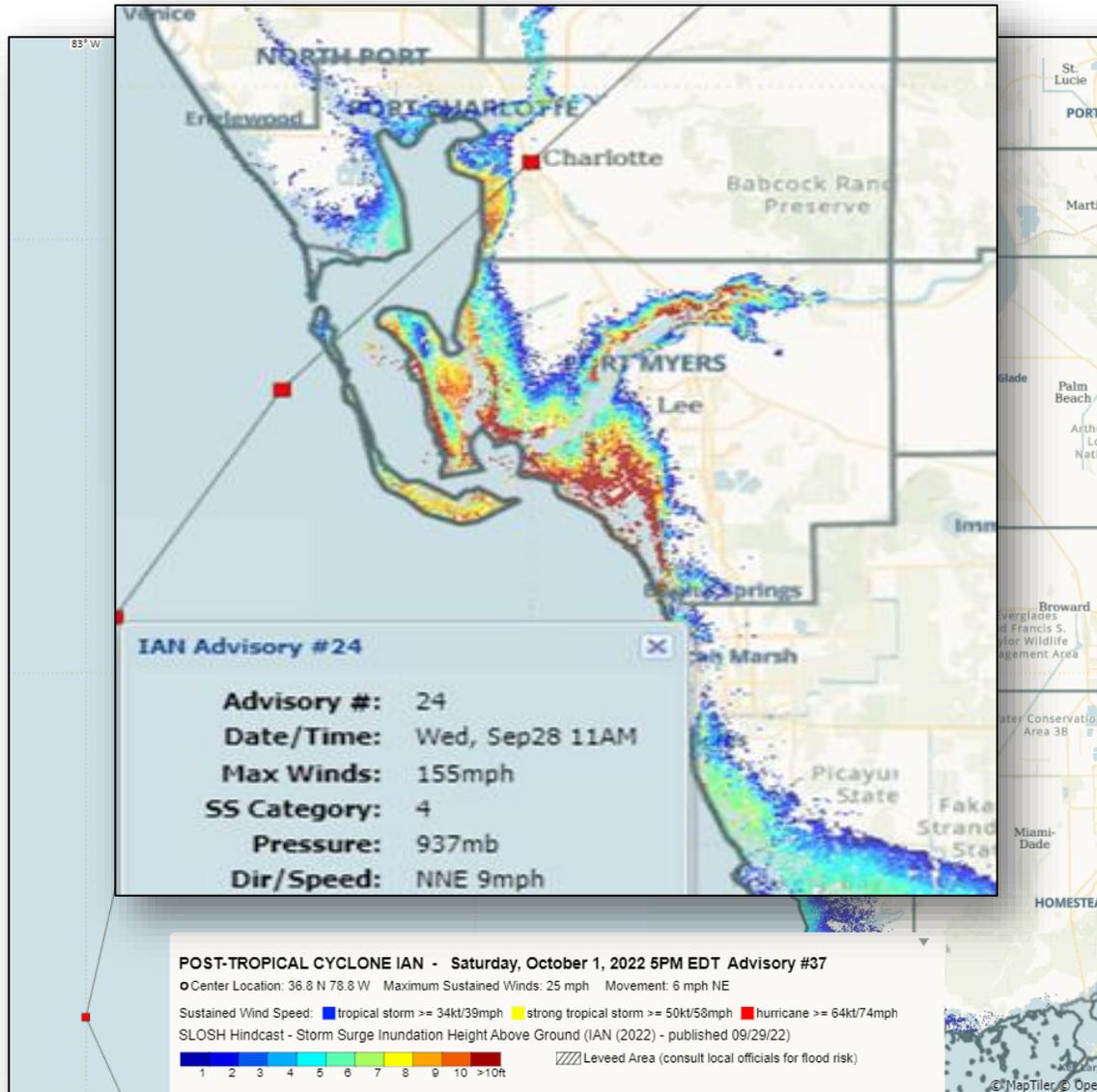
Leading Cause of Indirect Storm Fatalities



Surge Forecast 24-27 Hours Before Impact



2022 Major Hurricane Ian - Storm Surge



- 6-10 feet water overtopped barrier islands
- Max surge 10 to 15 feet.
 - Structures washed off their foundation at locations where water was *flowing* over the barrier islands
 - Structures flooded with salt water on the inland side of the intercoastal
- Tides were 4-7 feet below normal north of the eye wall

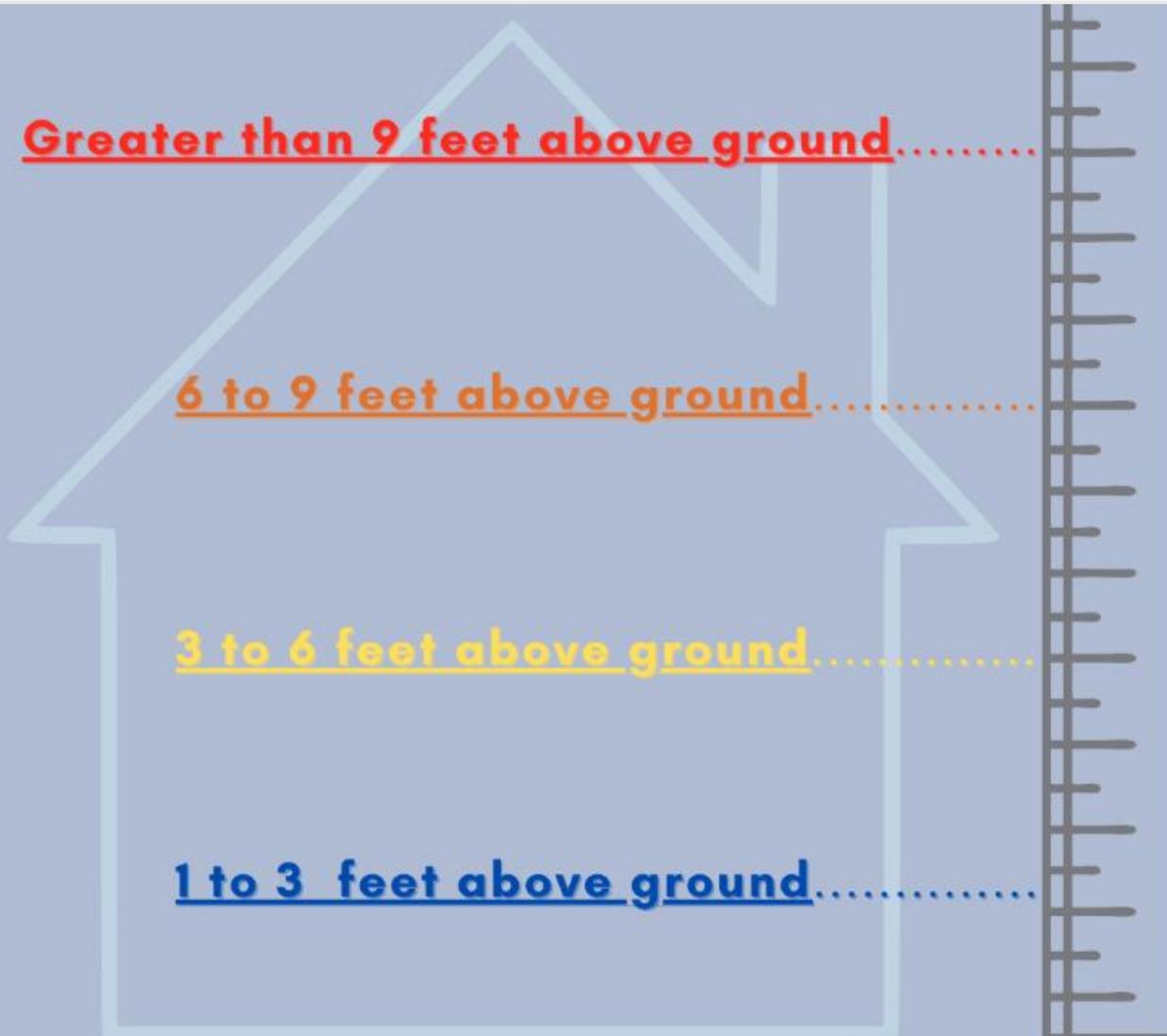
What is the Risk?

Storm surge is the abnormal rise of water generated by storm's winds. This hazard is historically the leading cause of hurricane related deaths in the U.S. Storm surge and large battering waves can result in large loss of life and cause massive destruction along the coast.

Above ground level describes the water level of the flooding that moves inland due to the combined effect of storm surge and tide.



NATIONAL WEATHER SERVICE
WEATHER FORECAST OFFICE
TAMPA BAY, FL



Another Surge Wave Making the Surge Higher



This is a Road

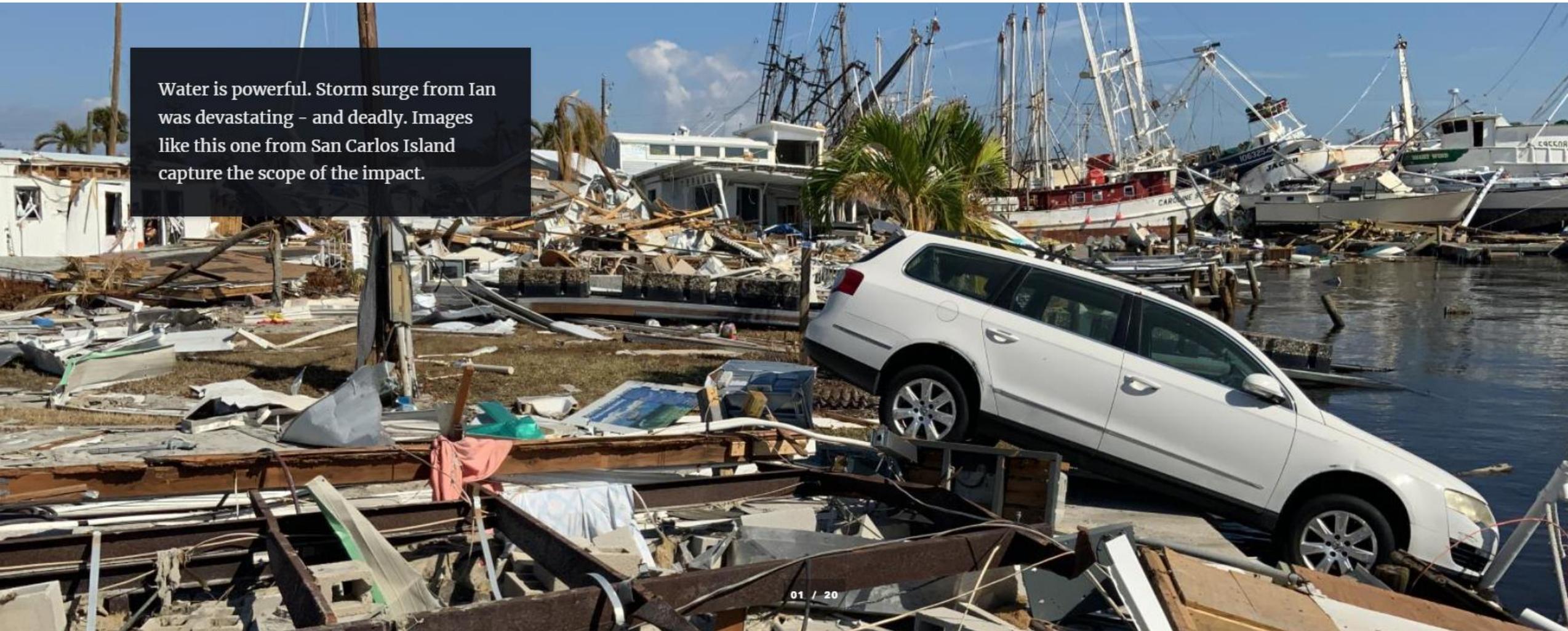


If the surge is about to flood your neighborhood, it is too late to leave safely

Flooding happens fast. One minute a dry road, the next minute it looks like this

Hurricane Ian: The Power of Moving Water

Water is powerful. Storm surge from Ian was devastating - and deadly. Images like this one from San Carlos Island capture the scope of the impact.



01 / 20

2022 Major Hurricane Ian - Impact



Casey Shannon
1d · 🌐

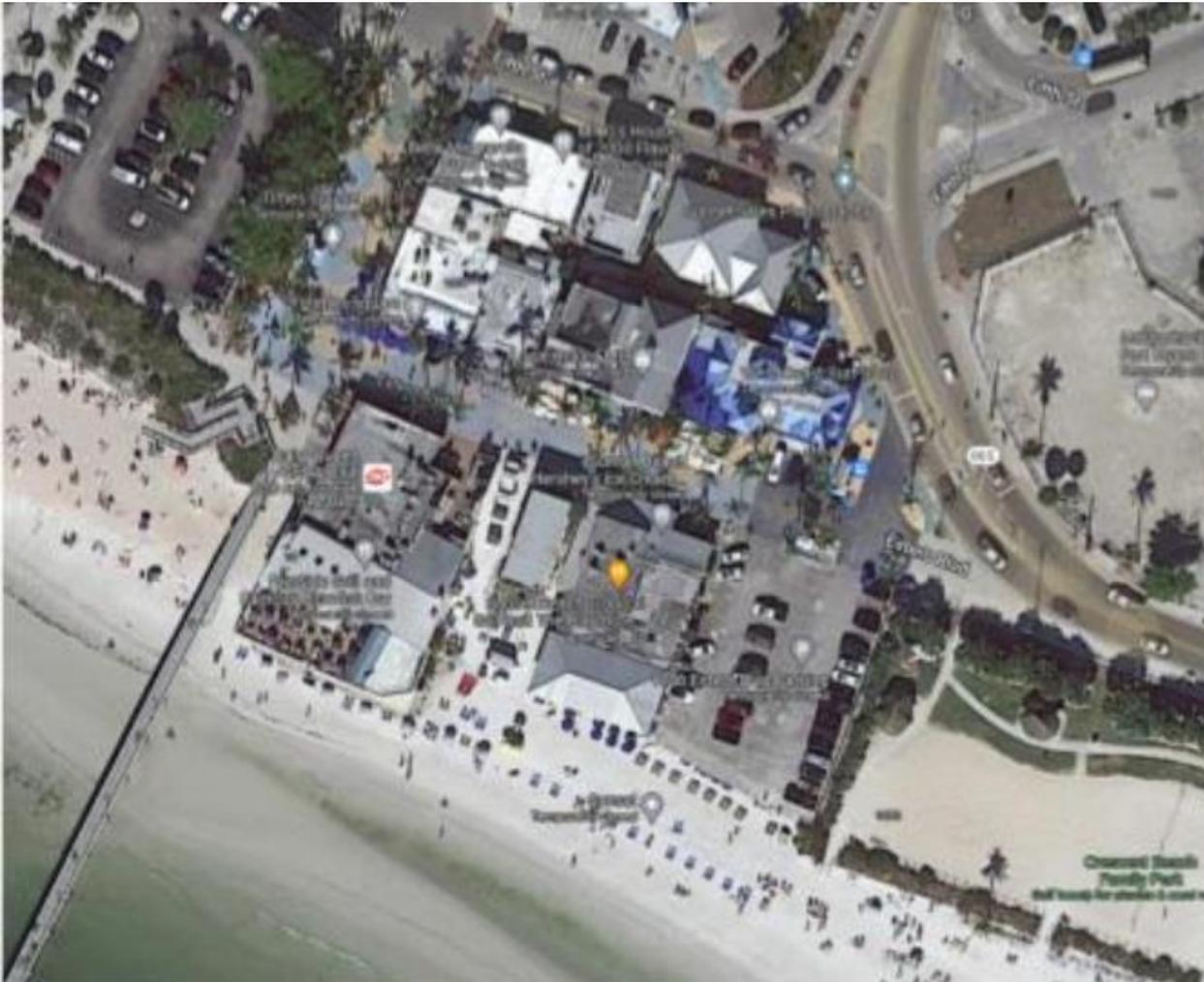
I took this earlier today, around 4:30. This is highway 70 looking south east over the train tracks coming into Arcadia. I took some video too but I don't have a battery big enough to upload it over a mobile Hotspot. This is the highest I've ever seen the river...



👍👍 6 2 shares

👍 Like 💬 Comment ➦ Share

Before & After: Time Square, Fort Myers Beach





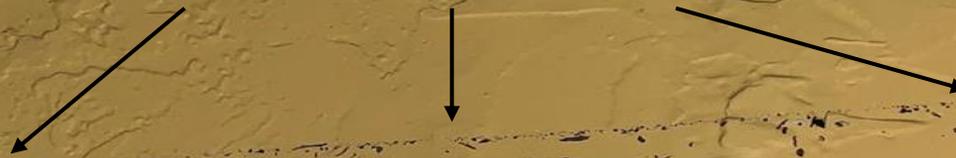
Naples & Naples Airport during 2022 Hurricane Ian





Max storm surge height

Water mark inside building above door on Fort Myers Beach



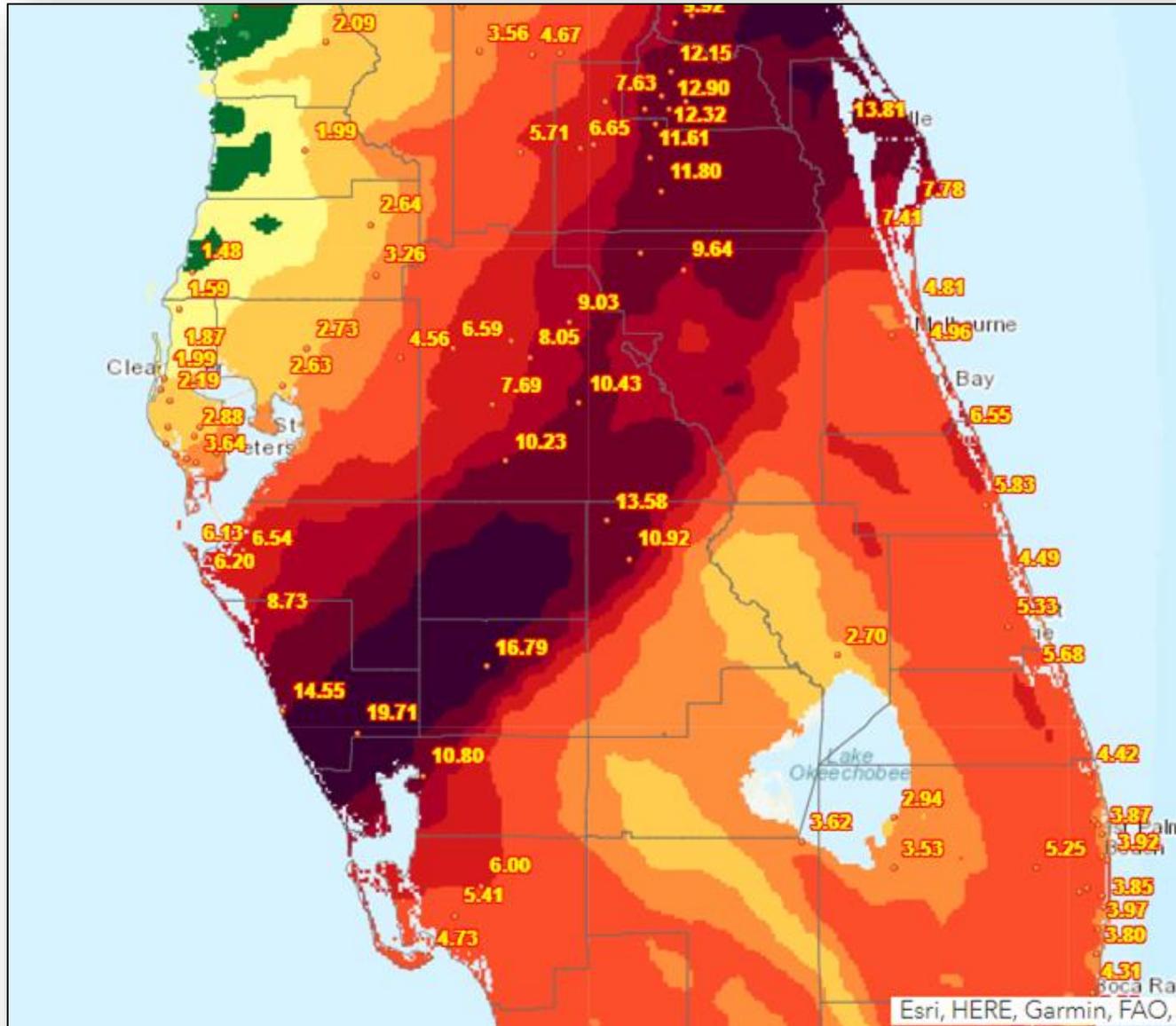
This is the storm surge +/- tide height. Add wave action on top of this

Hurricane Ian: The People and Their Stories



Flooding from heavy rain is the second leading cause of fatalities in a tropical cyclone

2022 Major Hurricane Ian - Rain



C. STORM TOTAL RAINFALL FROM 1200 UTC SEP 27 UNTIL 1200 UTC SEP 30

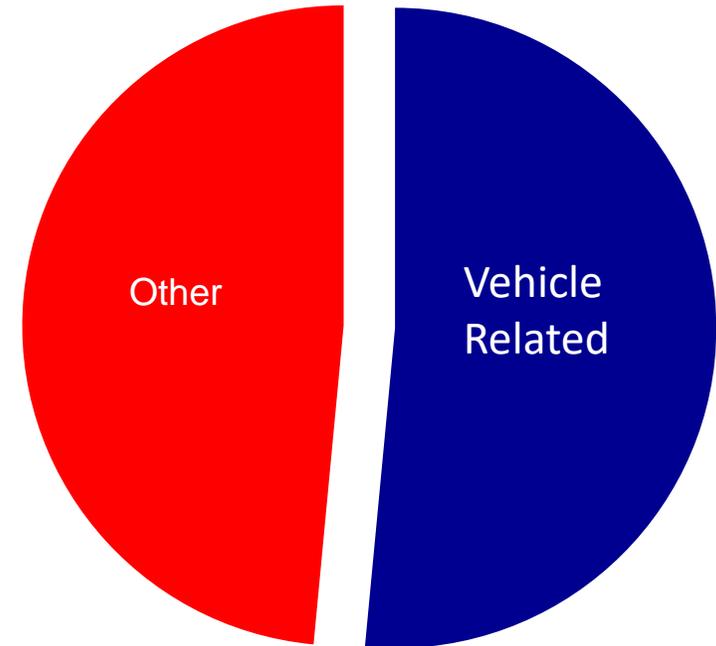
CITY/TOWN	COUNTY	ID	RAINFALL (IN)
1 NNW GROVE CITY 26.93 -82.33	CHARLOTTE	25056	26.95
1 NW CHARLOTTE BEACH 26.94 -82.22	CHARLOTTE	25218	22.97
3 NE NORTH PORT 27.08 -82.15	SARASOTA	25835	21.45
2 S ZOLFO SPRINGS 27.46 -81.80	HARDEE	25195	20.13
3 E ZOLFO SPRINGS 27.50 -81.75	HARDEE	25172	19.97
10 WSW PINE LEVEL 27.19 -82.13	SARASOTA	25603	19.83

2016-2018 Water Continues to Kill

More than half the U.S. tropical cyclone water-related fatalities were vehicle related!



2016-18 U.S. Tropical Cyclone Water Related Fatalities



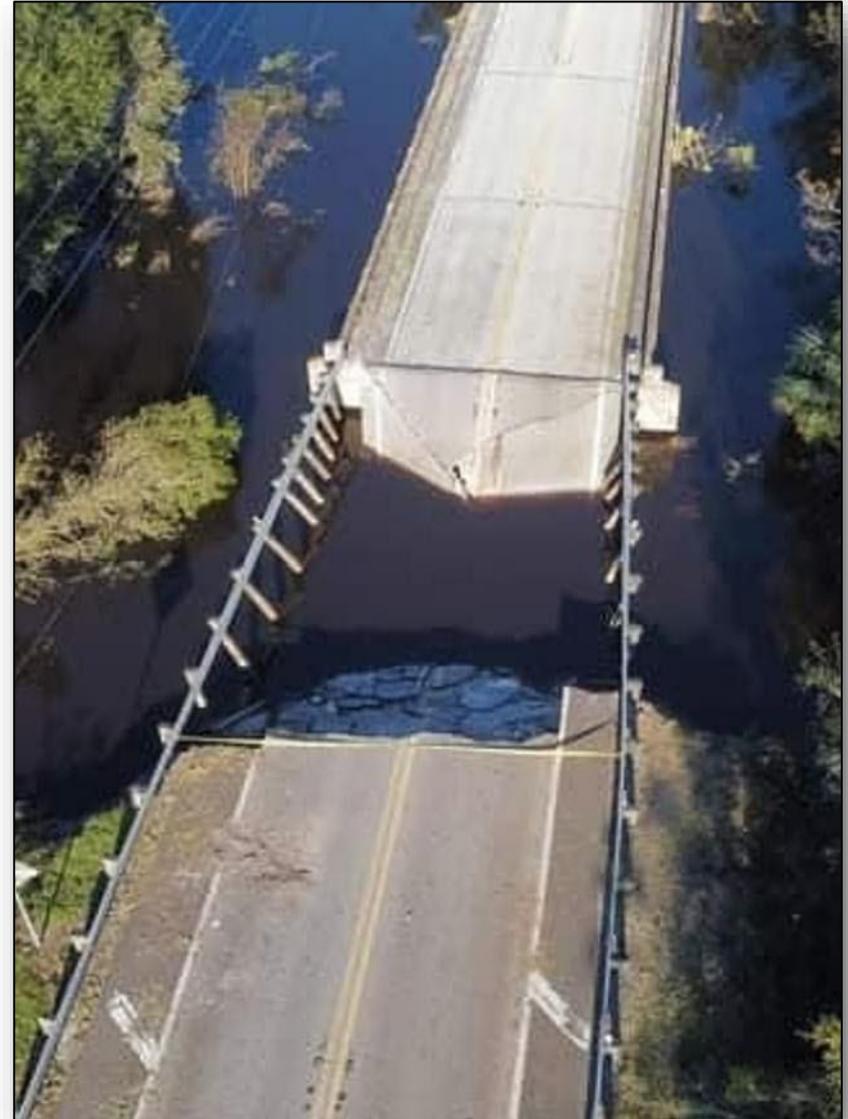
Flooding from Heavy Rain is #2 Hurricane Threat



Wayne Sallade

5h · 🌐

Gee, you wondering why U.S. 17 South is closed and probably will be for some time?



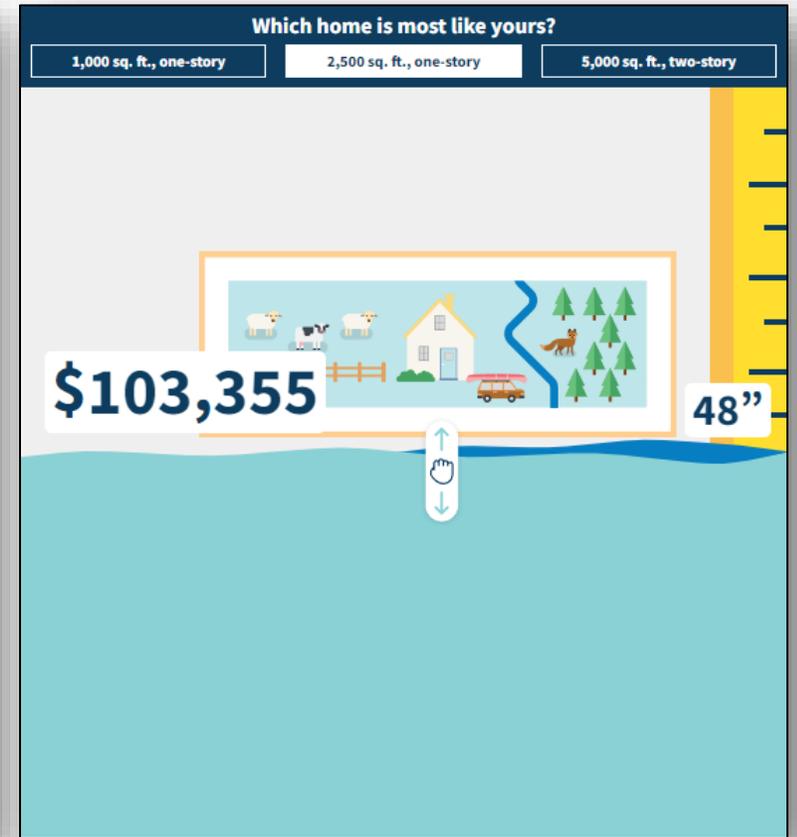
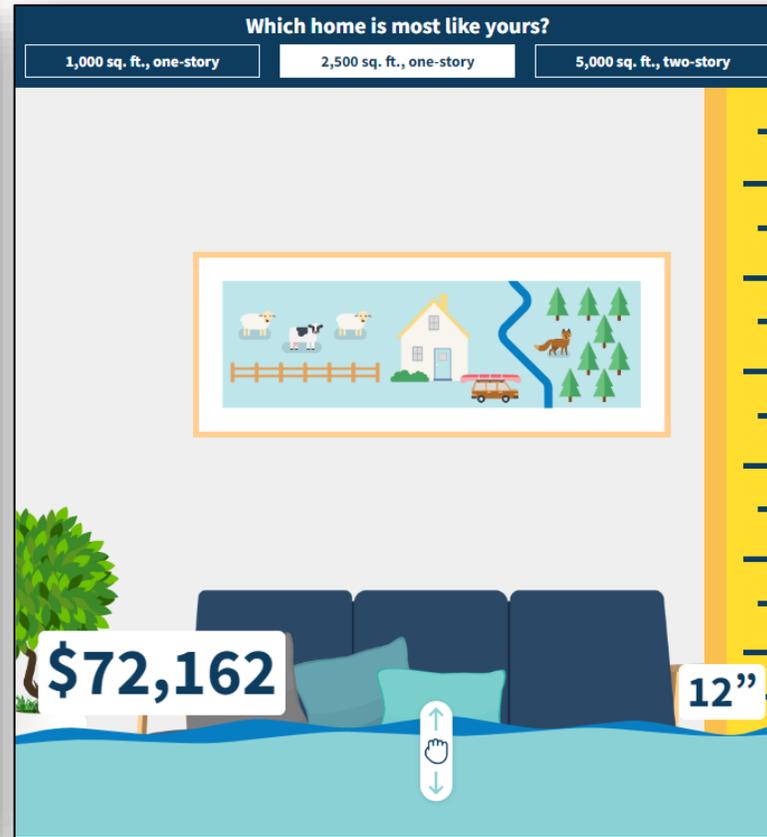
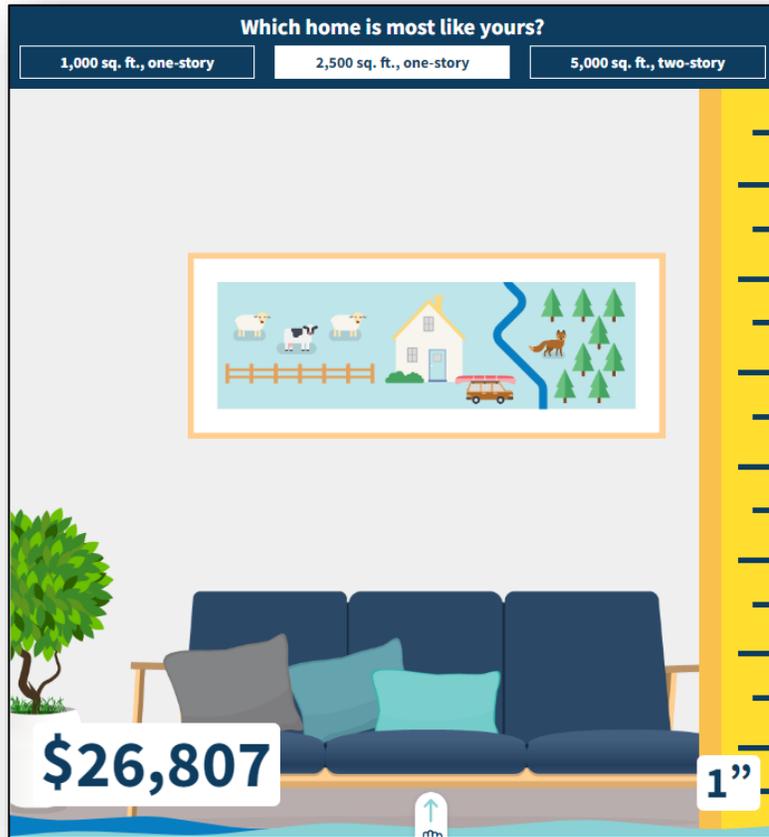


2012 Tropical Storm Debby – Hernando County

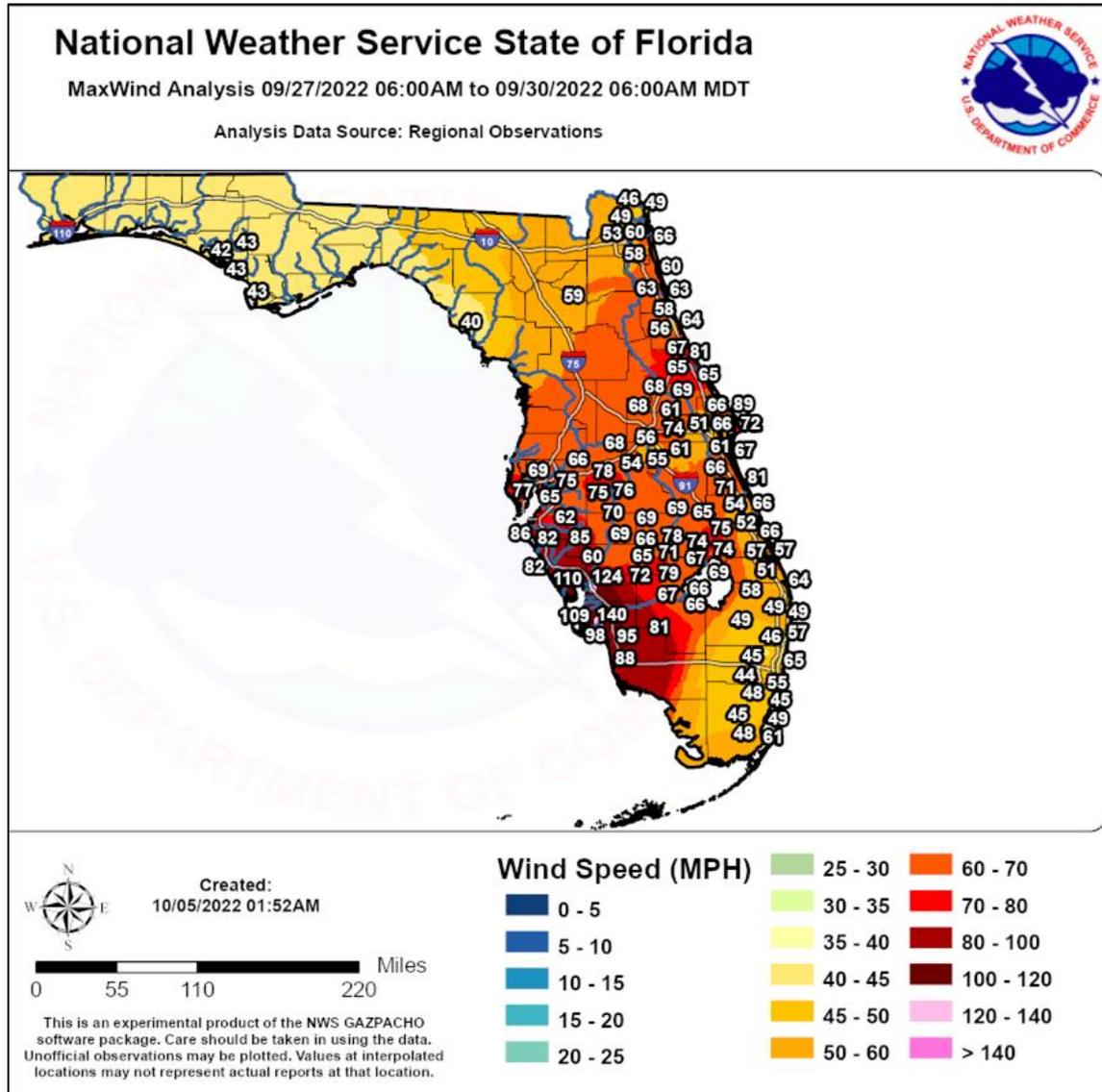


Sun Coast Parkway Closed for 7 Days

Consider Flood Insurance, Even if not Required

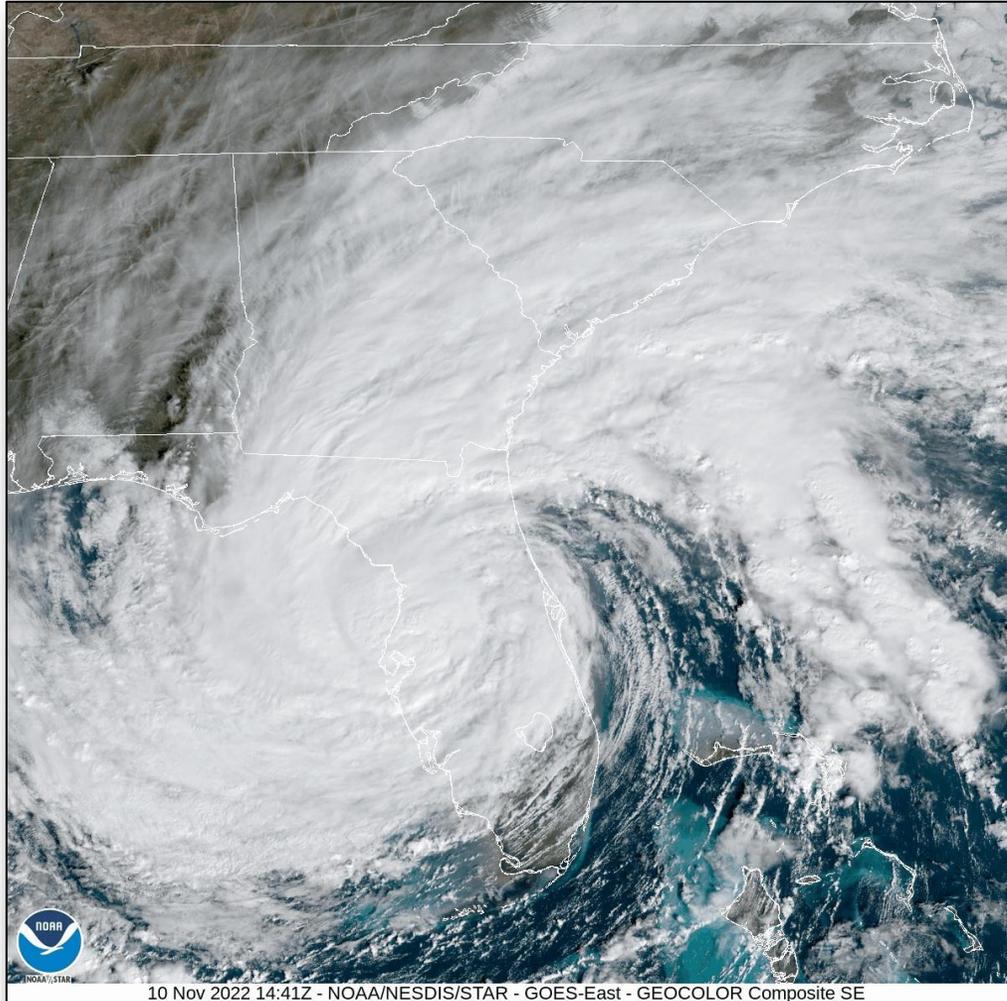


2022 Major Hurricane Ian – Max Wind Gust



- Landfall is when the *center* of the eye wall crosses the beach
- Landfall at Cayo Costa - 305 PM EDT Wed Sep 28, 2022
 - CAT 4, 150 mph, 940 mb
- Max Recorded Wind over land
 - 140 mph in Cape Coral
 - 135 MPH in Punta Gorda

Hurricane Ian Wind Damage



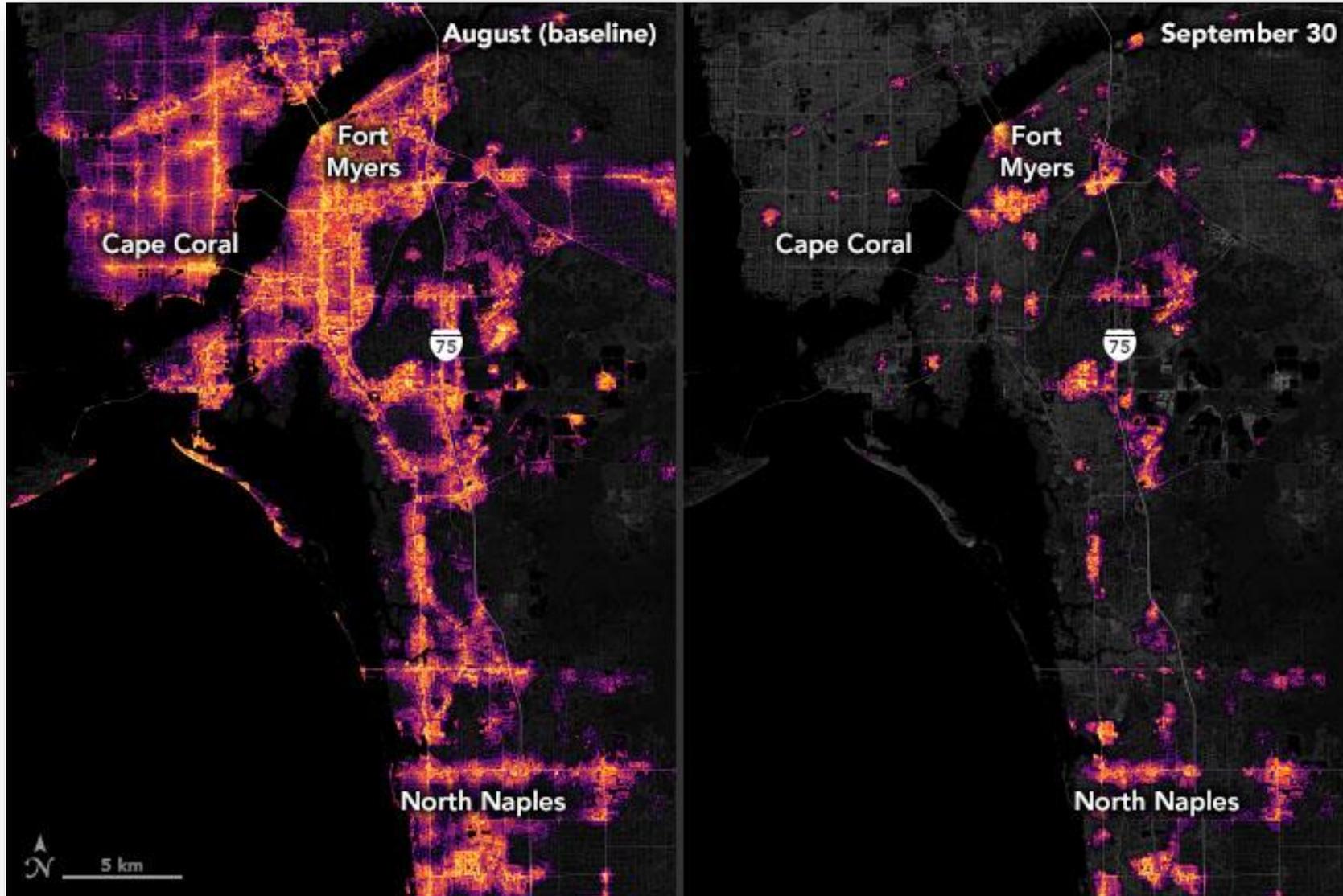
2017 Hurricane Irma - Falling Trees and Power Outages



13 million without power at one time or another

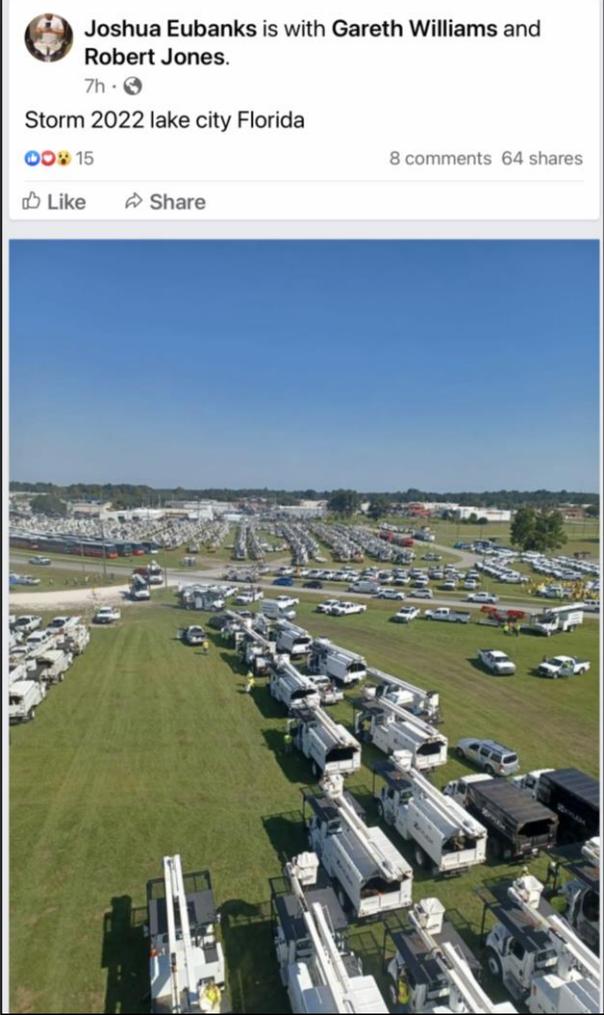


Power Outages After Hurricane Ian



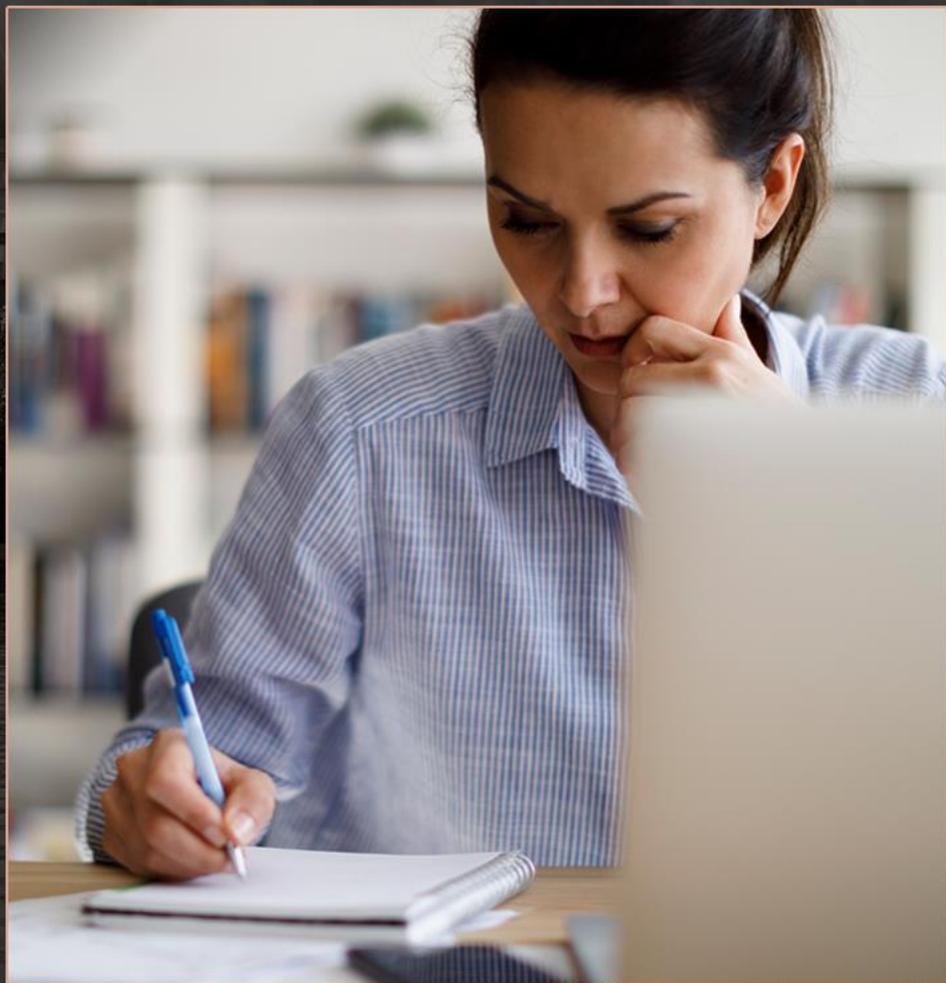
Unofficial estimate of
2.7 million without
power on Sep 29, 2022

Recovery



Hurricane Preparedness

Complete a Written Plan



Have a contact list



Keep critical documents together for quick access



Have at least one contact outside of the impact area



Share your plan

<https://www.ready.gov>

weather.gov



Hurricane Preparedness

ASSEMBLE DISASTER SUPPLIES



Make a list of supplies and assemble them before hurricane season begins. Have enough food and water for each person for at least three days. Fill your prescriptions and have medicine on hand. Radios, batteries and phone chargers are also must-haves. Gas up your vehicle and have cash on hand.



Food & water



Medicine & prescriptions



Keep gas tank full



Radio, batteries, phone chargers

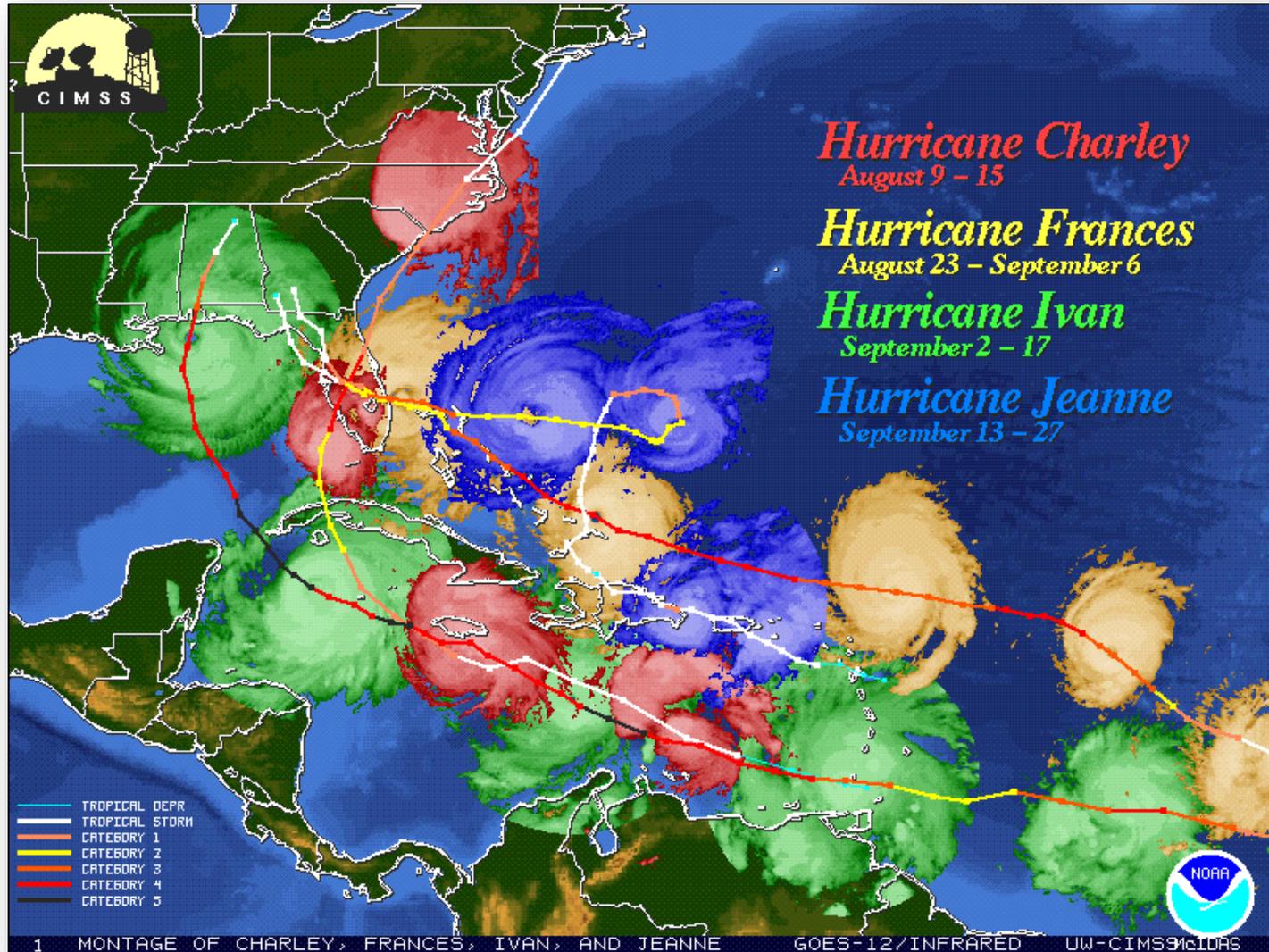


Cash on hand

weather.gov/hurricane



Questions or Comments? Email Daniel.Noah@noaa.gov



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