FEMA Building Science

Hurricane Michael Situation Report 10/11/2018 as of 11 AM EST

Roll Call

FEMA, NIST, HUD, FDEM, FDEP, NSF STEER, AIA, ASCE, ASFPM, FLASH, IBHS, ICC, Universities, PTS, Other

1. Data Collection and Operational Coordination

On hand – critical facilities, FEMA HMA, ASCE 7, building code adoption, shelters, storm surge advisory, parcel data, Day 1 preliminary wind map

Processing – flood insurance policies

Requested – Public Assistance and State mitigation project data

Preparing for – Imagery

10/10/18-State of Emergency Declared and HHS Public Health Emergency Declaration (FL)

2. Meteorological History

Hurricane Michael has made landfall Wednesday afternoon October 10, 2018 near Mexico Beach, Florida as a Category 4 storm with maximum sustained winds measured to be at 155 mph, just shy of Cat. 5.

This is the strongest hurricane to hit the Florida Panhandle (records go back to 1851).

Strongest observed winds (preliminary) were observed at Tyndall AFB with 129 mph gusts.

Highest rainfall amount was 6.63 inches in Calhoun, GA.

https://twitter.com/NWSTallahassee/status/1050322982743265280

Storm Surge (NHC)	
Tyndall AFB to Aucilla River FL	4-8 ft
Okaloosa/Walton County Line FL to Tyndall AFB	3-5 ft
Aucilla River FL to Chassahowitzka FL	3-5 ft
Chassahowitzka to Anclote River FL	2-4 ft
Sound side of NC Outer Banks from Ocracoke Inlet to Duck	2-4 ft

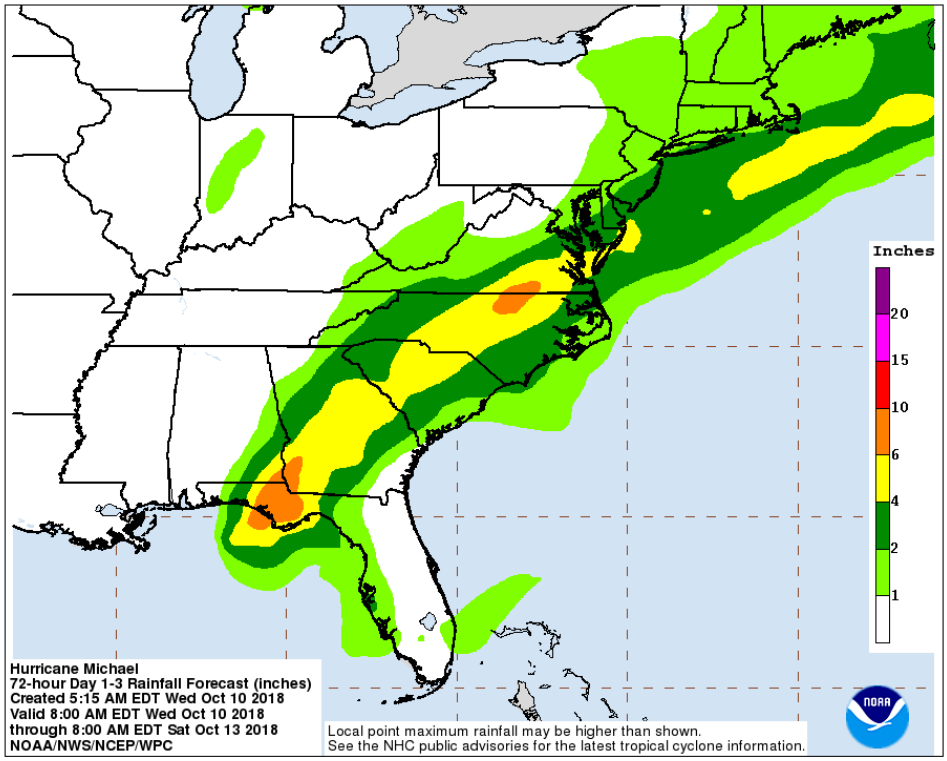
For Internal FEMA Use Only – Do Not Distribute

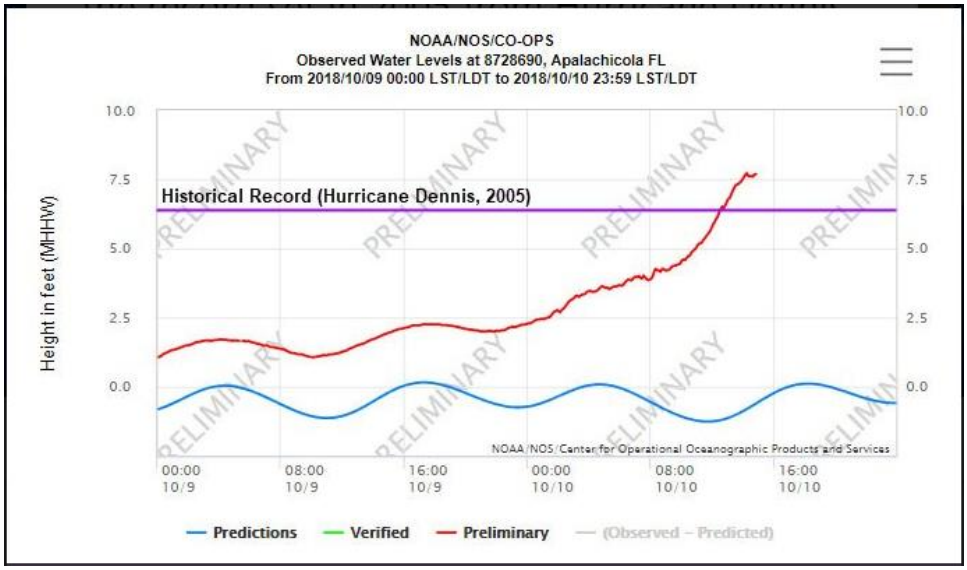
Strongest Continental United States Landfalling Hurricanes (Ranked by Pressure)						
Rank	Year	Month	Day	Storm Name	Landfall Wind (kts)	Landfall Pressure (mb)
1	1935	9	3	Labor Day	160	892
2	1969	8	18	Camille	150	900
3	**2018**	**10**	**10**	**Michael**	**135**	**919**
4	2005	8	29	Katrina	110	920
5	1992	8	24	Andrew	145	922
6	1886	8	20	Indianola	130	925
7	1919	9	10	Florida Keys	130	927
8	1928	9	17	Lake Okeechobee	125	929
T-9	1926	9	18	Great Miami	125	930
T-9	1960	9	10	Donna	125	930
T represents tie with other years						
Continental US landfalling hurricane data goes back to 1851						

https://twitter.com/philklotzbach

3. Rainfall:

U.S. Rainfall QPF (from WPC)

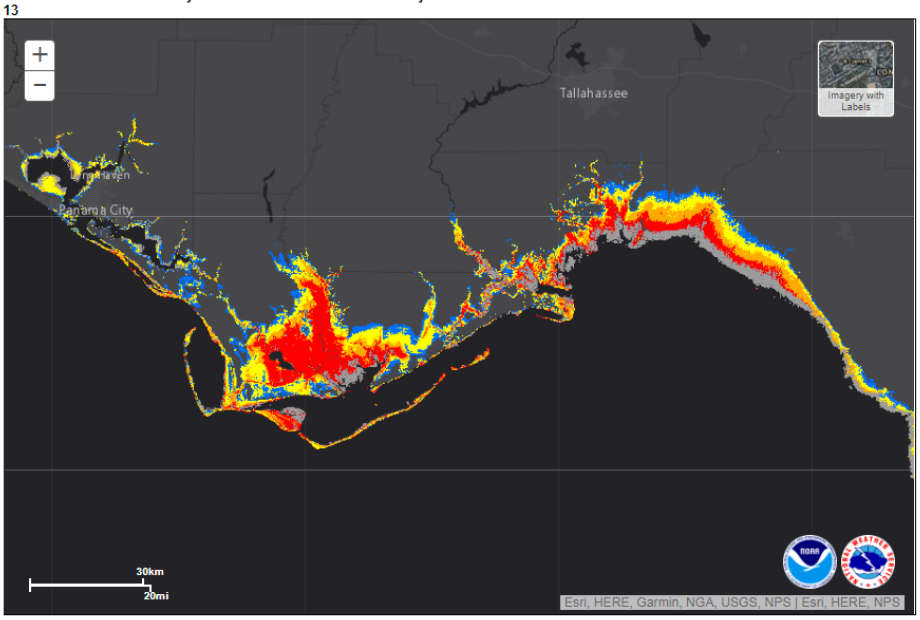




https://twitter.com/noaaocean/status/1050104142377697280

Potential Storm Surge Flooding Map (Inundation)

NHC Potential Storm Surge Flooding Map
Hurricane MICHAEL (2018) Advisory 16
From 11 AM EDT Wednesday October 10 to 05 PM EDT Saturday October 13



Potential Storm Surge Flooding*

- Intertidal Zone/Estuarine Wetland
- Greater than 1 foot above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground

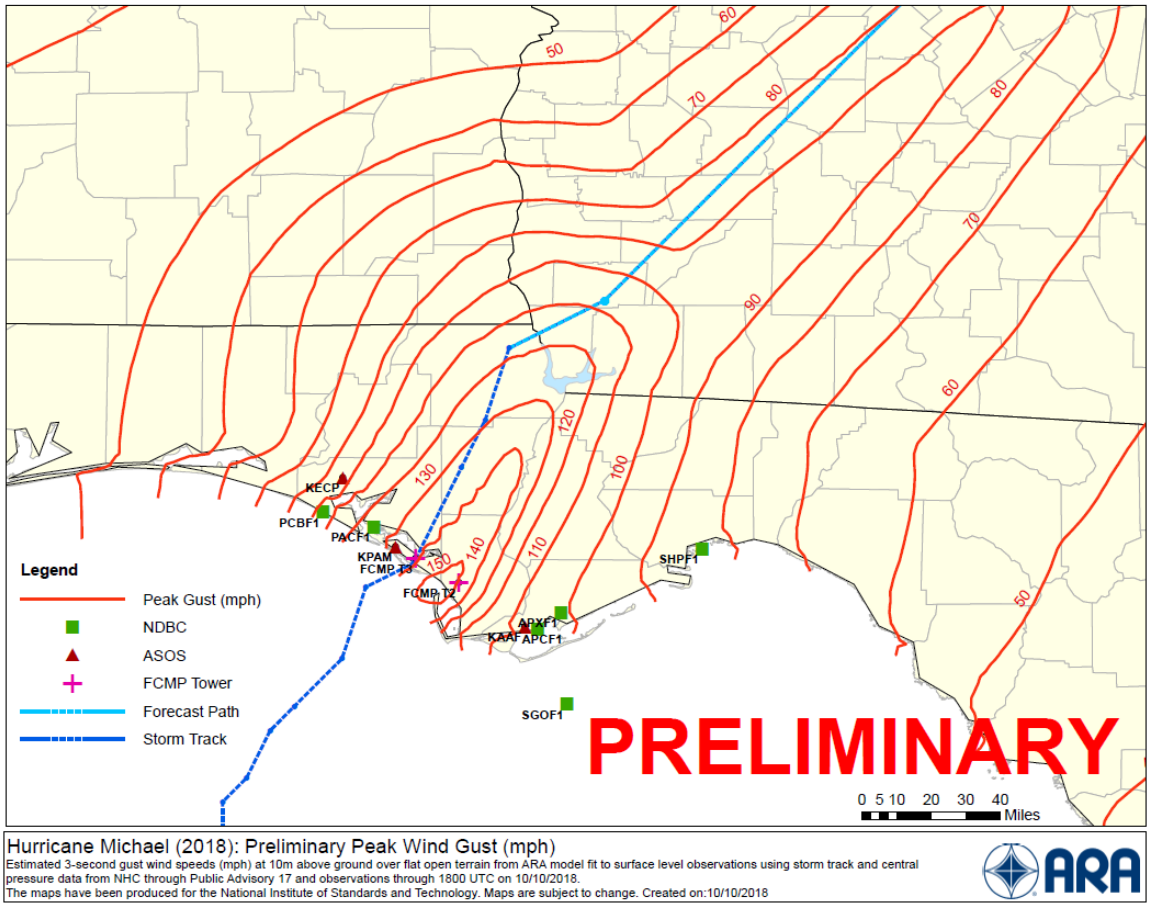
Map Layer Options:

Inundation Layer Only | Inundation with Intertidal Layer

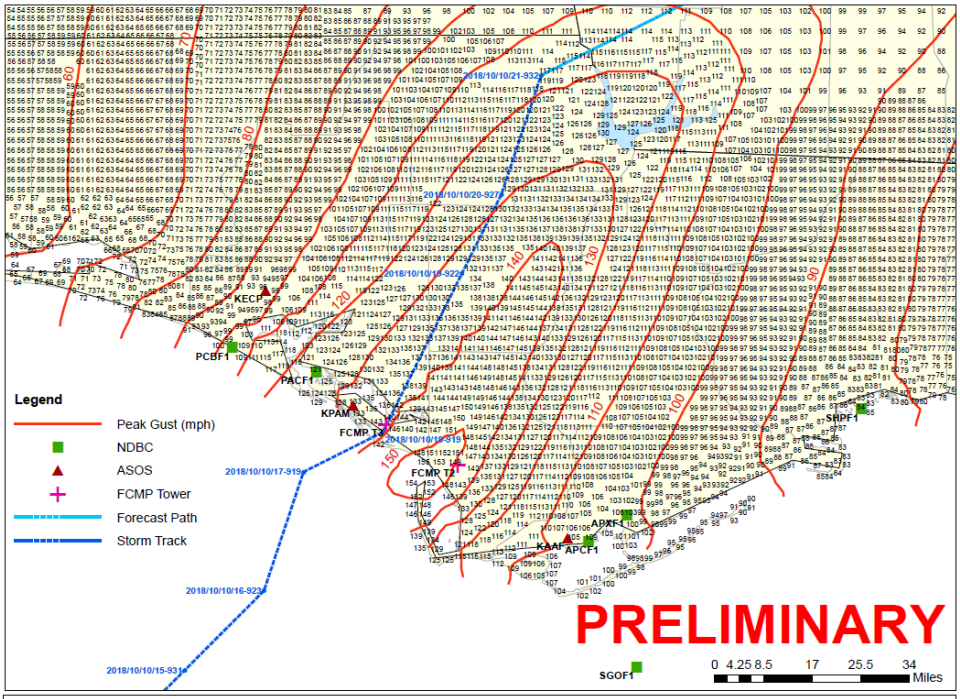
Map Opacity Slider

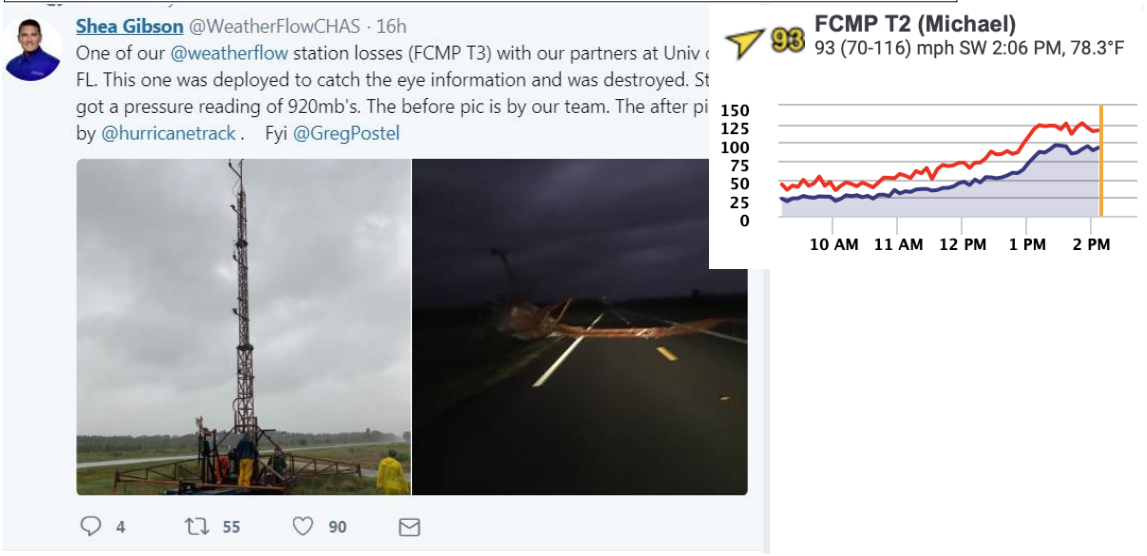
Download GIS data (Instructions)	Inundation Layer Only	Inundation with Intertidal Layer

*Displayed flooding values indicate the water height that has about a 1-in-10 (10%) chance of being exceeded.



Hurricane Michael (2018): Preliminary Peak Wind Gust (mph)
Estimated 3-second gust wind speeds (mph) at 10m above ground over flat open terrain from ARA model fit to surface level observations using storm track and central pressure data from NHC through Public Advisory 17 and observations through 1800 UTC on 10/10/2018.
The maps have been produced for the National Institute of Standards and Technology. Maps are subject to change. Created on:10/10/2018





4. Shelter/Evacuation:

Shelters (FL) 25 total with a population of 3519 (https://www.floridadisaster.org/shelter-status/)

Residents of 22 Florida counties along the Panhandle and the west coast were issued mandatory evacuation orders. Some have been lifted as of this morning. Several are still in effect. (https://www.floridadisaster.org/info/)

5. Building Performance Observations:

CNTYNAME	Total	Before 2002	*% Before 2002*	From 2002-2011	*% From 2002-2011*	2012 and more	*% 2012 and more*
Bay	68,181	51,934	*76%*	14,135	*21%*	2,112	*3%*
Calhoun	4,364	3,790	*87%*	486	*11%*	88	*2%*
Gulf	3,251	2,123	*65%*	819	*25%*	309	*10%*
Jackson	11,928	10,321	*87%*	1,433	*12%*	174	*1%*
Washington	1,173	868	*74%*	279	*24%*	26	*2%*
Total	88,897	69,036	*78%*	17,152	*19%*	2,709	*3%*

Will discuss/highlight performance observations examples in further detail in Section 10.

6. Infrastructure Impacts (see State/County EM or responsible organization for latest status):

All airports along the Florida Panhandle will be closed throughout the storm and all flights cancelled until hubs reopen.

All bridges leading to and from coastal islands were closed Wed. morning. Road closures expected to be fluid situation.
(https://floridadisaster.maps.arcgis.com/apps/webappviewer/index.html?id=a8f27c77c8554493a253eb5780f316d8)

- Alabama EMA is reporting over 60,000 customers without power.
- Georgia Power is reporting 42,242 customers without power.
- Florida SERT is reporting 400,666 customers without power.

7. Hospitals:

10/10/18-Bay County – First responders were no longer able to respond to emergencies as of Wednesday morning, but the Panama City Fire Department would continue responding to life-threatening emergency calls that came from within the city limits.

Impacts to Health and Medical Systems			
	FL	GA	AL
Hospitals in possible surge inundation zone	35	0	0
Nursing Homes in possible surge inundation zone	102	0	0
Dialysis Centers in possible surge inundation zone	31	0	0

8. FEMA HMA Projects (awarded/obligated or closed projects potentially in the impact area)

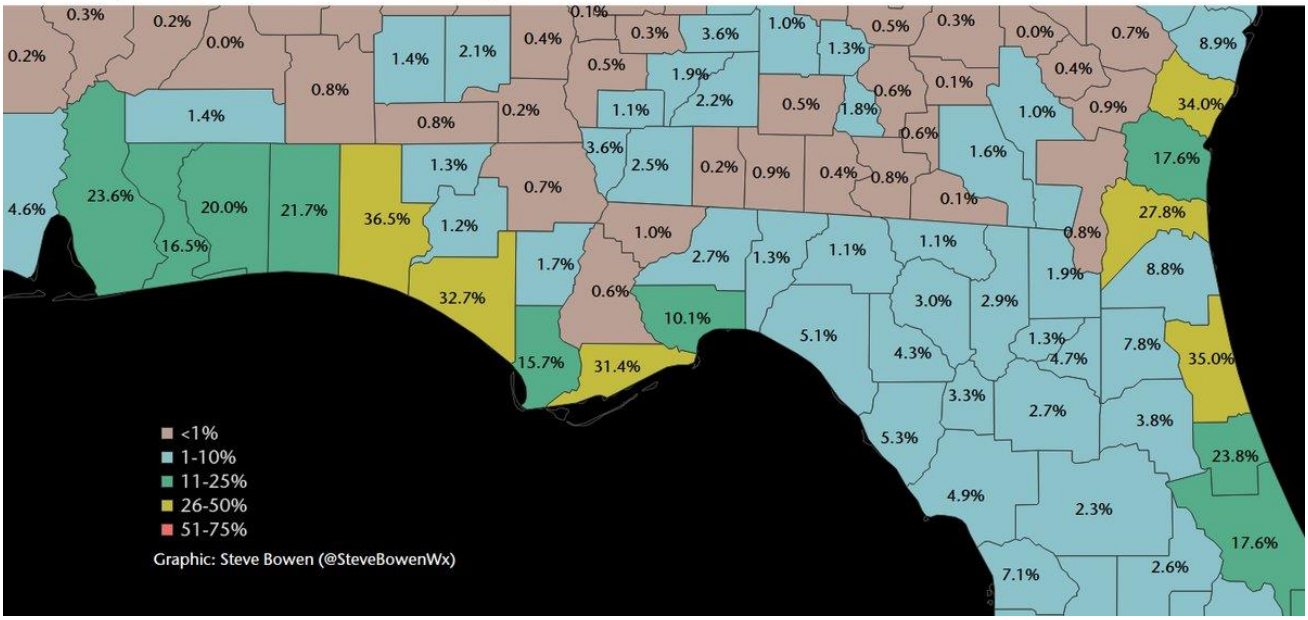
Project Type	Bay	Calhoun	Franklin	Gulf	Leon	Liberty	Wakulla	Escambia	Santa Rosa	Okaloosa	Walton
Acquisition	8	21	4	13	29	6		42	6	13	42
Elevation	8		2		1		1	31	31	4	5
Mitigation Reconstruction	1							14			
Safe Room/Wind Shelter	2							2	1	1	2
Wind Retrofit	83	5	10	21	79	4	4	6672	1656	25	1

Six lift station floodproofing projects in Bay County - Panama City

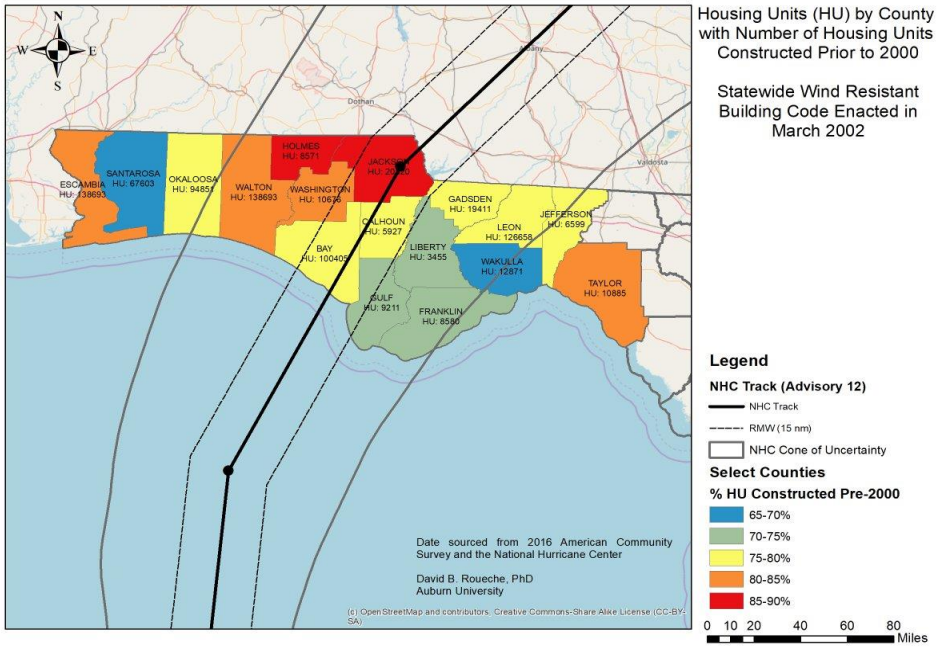
9. POTENTIAL Areas to Investigate

NFIP Insurance Policy % by County

Data: NFIP Policy Data (As of 07/31/18) & US Census Bureau Housing Units (2017)



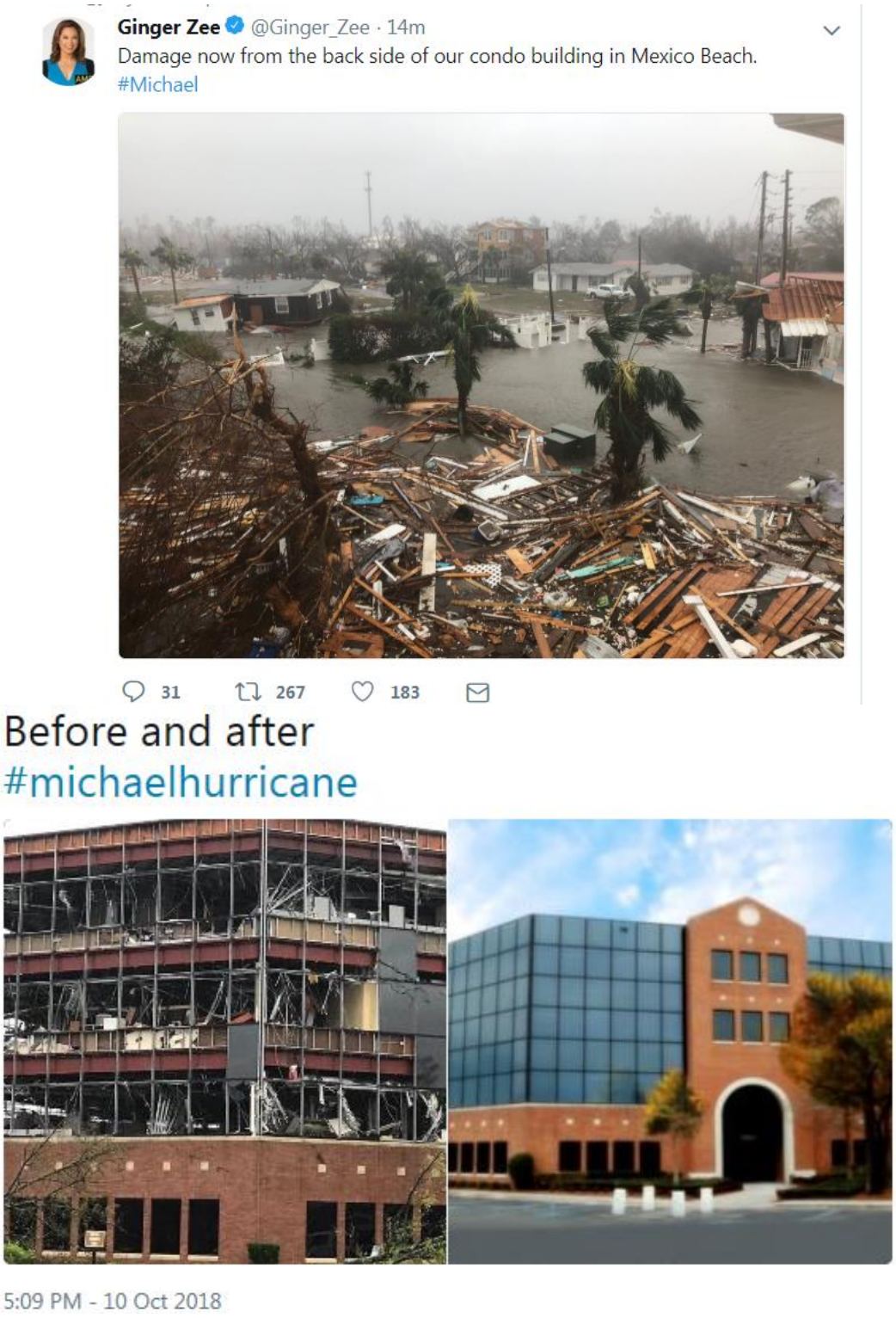
Source - https://twitter.com/SteveBowenWx/status/1049670106438090753



Source - https://twitter.com/auburn_windengr/status/1049697327508803589

10. Images of Observed Flooding and Damage:

https://twitter.com/NWSTallahassee?lang=en



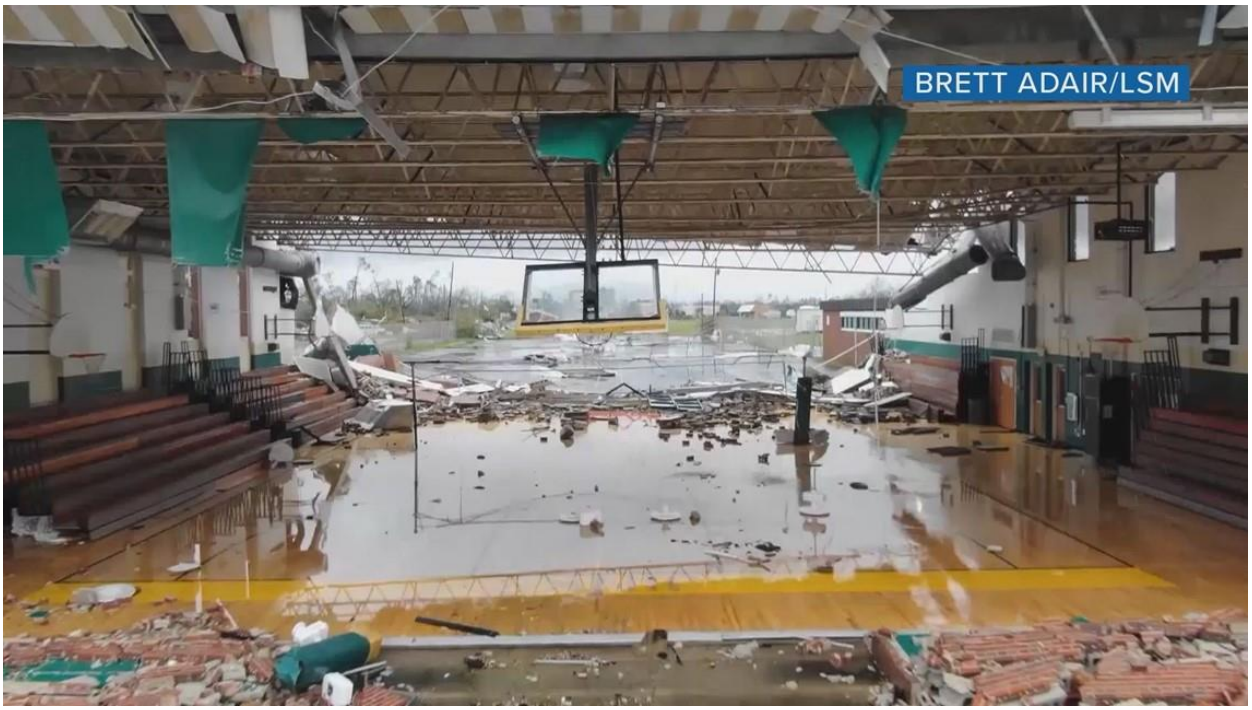
Peoples 1st building 23 Street, PC.
https://twitter.com/standingup4us/status/1050176637126565888

Everitt Middle School - 608 School Ave, Panama City, FL 32401
Year Built 1966, with construction/additions in 2002 and 2007

Jinks Middle School - 600 W 11th Street, PC, FL 32401

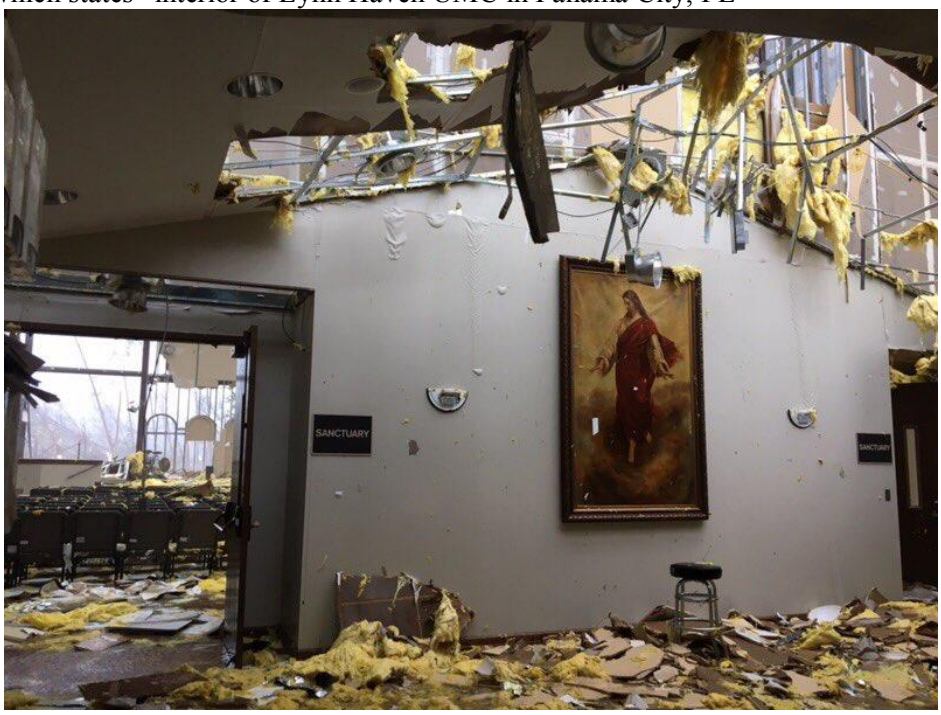
https://www.wtsp.com/article/weather/hurricane/drone-flies-through-panama-city-school-gym-damaged-by-hurricane-michael/67-603140443

https://www.youtube.com/watch?v=UGXOlDyb8bg



Lynn Haven United Methodist Church (Year Built 2004)

4501 Transmitter Rd, Panama City, FL 32404
https://twitter.com/thomasirby/status/1050132056385175567?s=11 – verifying location, currently based on this post which states “interior of Lynn Haven UMC in Panama City, FL”



Bay Medical Sacred Heart Hospital – Year built 1949 latest edition in 2010 (2010 edition picture below NOT A POST STORM PICTURE)

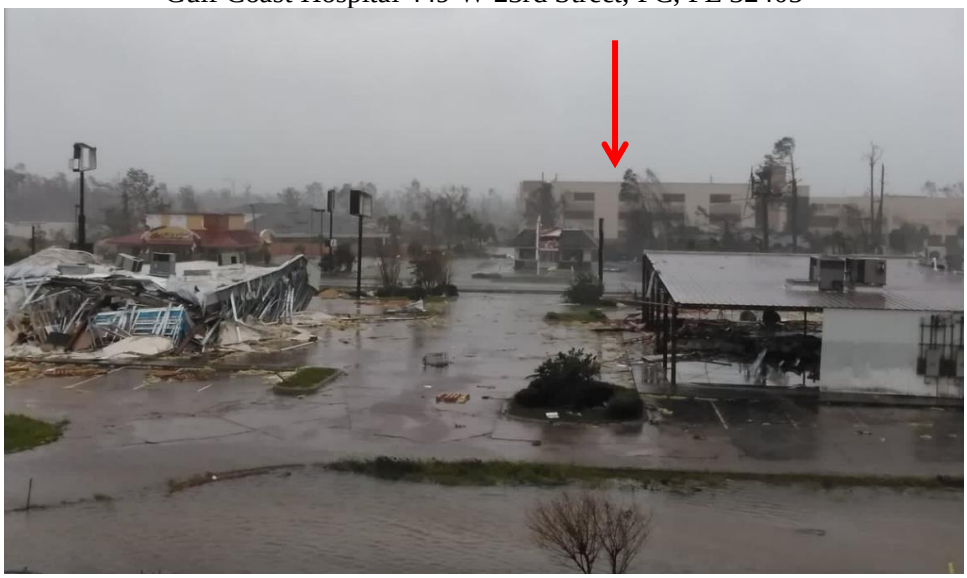
615 N Bonita Ave, Panama City, FL 32401

The largest hospital in Panama City, Fla., offering the area's only open-heart surgery. Level II Trauma Center.

https://twitter.com/baymedicalctr/status/1050125335528914944

Our hospital has sustained damage including windows blown out, cracking of an exterior wall, and roof damage. Our generators are working and our patients have been migrated to safe areas of the hospital. Our team is continuing to assess the damage

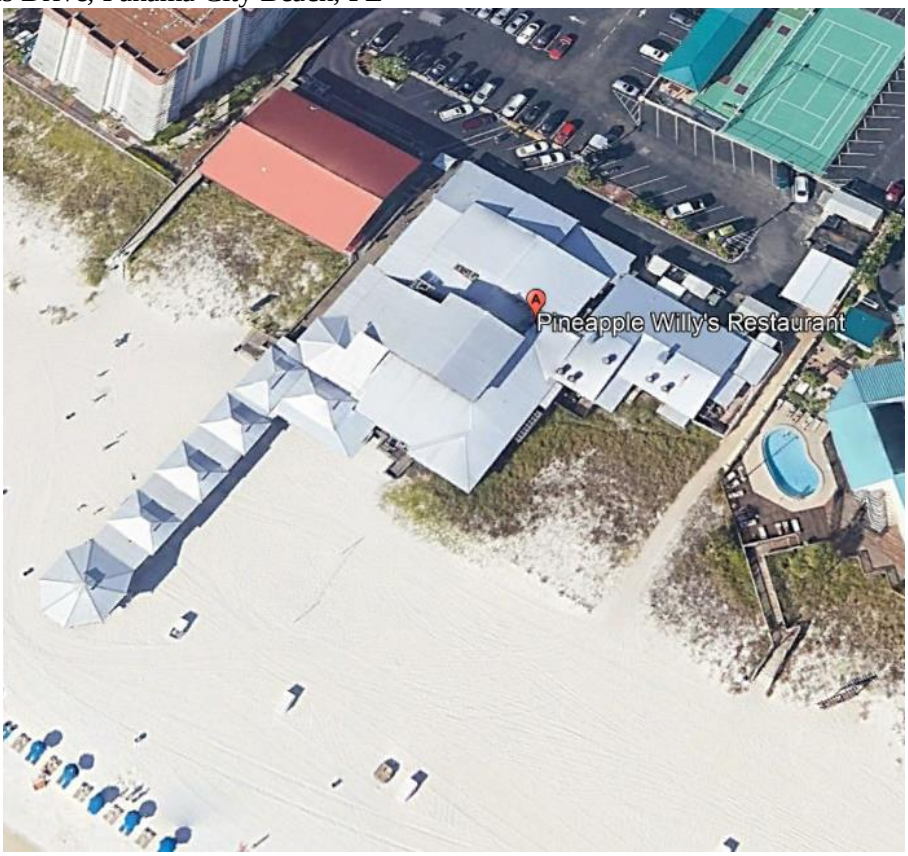
Gulf Coast Hospital 449 W 23rd Street, PC, FL 32405



559 Harrison Ave, Panama City, FL 32401

https://twitter.com/FOX13News/status/1050143422638641152

Panama City Damage Video - https://youtu.be/HJZpx7LRd8I
Bay County – Panama City Beach
9875 S Thomas Drive, Panama City Beach, FL



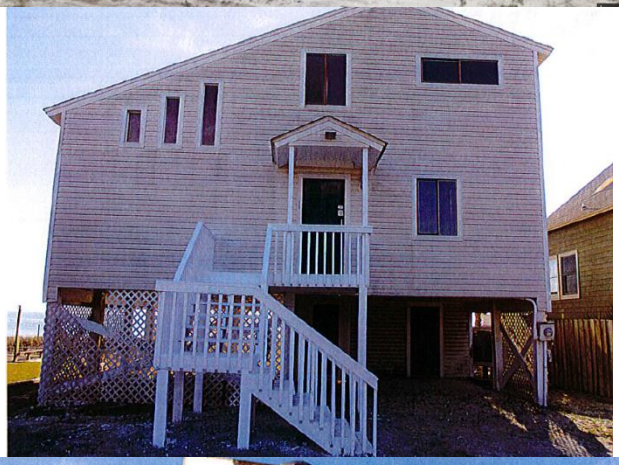
https://twitter.com/jpetramala/status/1050143597511811073?s=11

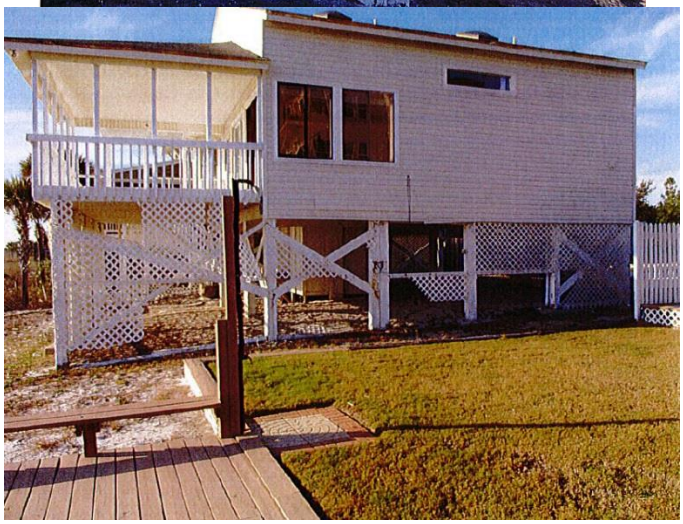
Bay County - Mexico Beach –

2303 US-98, Mexico Beach, FL 32456 (Year Built 2005), Zone AE, Approximate peak wind gusts 140-150 mph surrounding residential structures completely gone adjacent to this property see https://twitter.com/chrisdolcewx/status/1050157608328486912 or https://www.facebook.com/jasonherokennedy/videos/2101747343178898/

https://twitter.com/Ginger_Zee/status/1050141276274905088

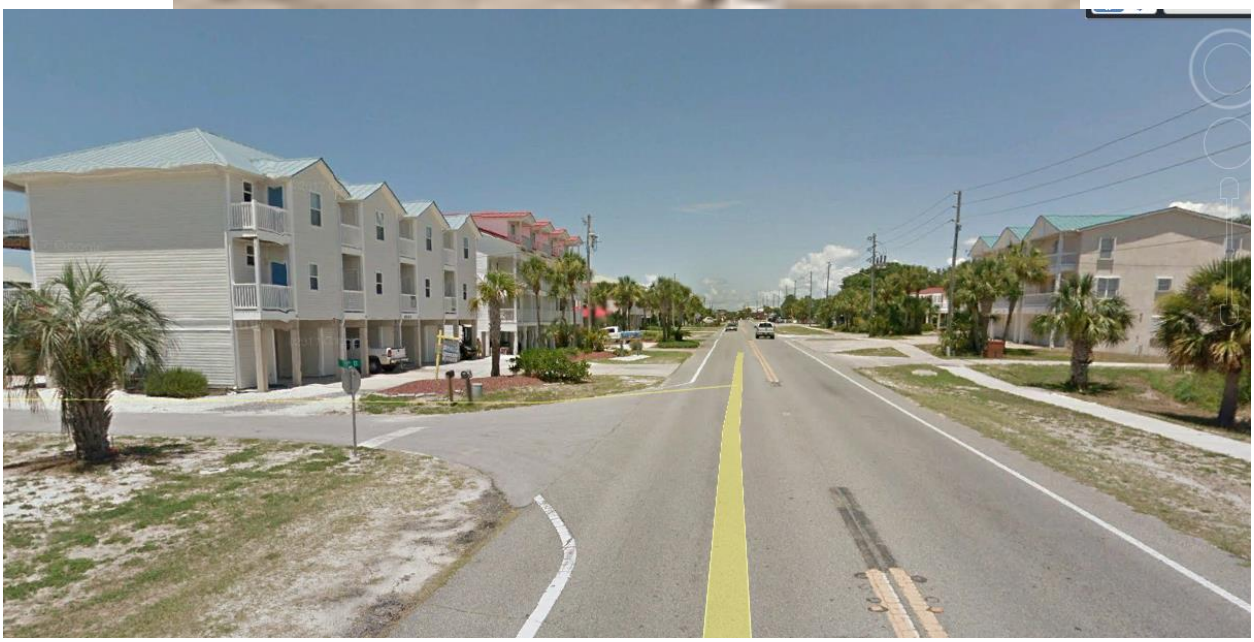
https://twitter.com/chrisdolcewx





2309 US-98, Mexico Beach, Florida Year Built 1983, Zone AE12, EC Building Diagram 6, Top of Bottom Floor is 13.05, Lowest Adjacent Grade is 10.29

https://twitter.com/Ginger_Zee/status/1050151926816534528 (structures on left built in 2003, right 2004)



https://weather.com/storms/hurricane/news/2018-10-10-hurricane-michael-impacts-florida-gulf-coast

Gulf County – Port St Joe

Reid Ave, Port St Joe, FL

https://twitter.com/cliftimestweet/status/1050112880618680321?s=11

Port St Joe Damage Video - https://youtu.be/XHCymR3qIwA
Cecil G. Costin Sr. Blvd Port St Joe, Florida = https://youtu.be/XHCymR3qIwA?t=122

Franklin County – St George Island

https://twitter.com/PMBreakingNews/status/1050161120118538241 (Video)

Franklin County – Alligator Point

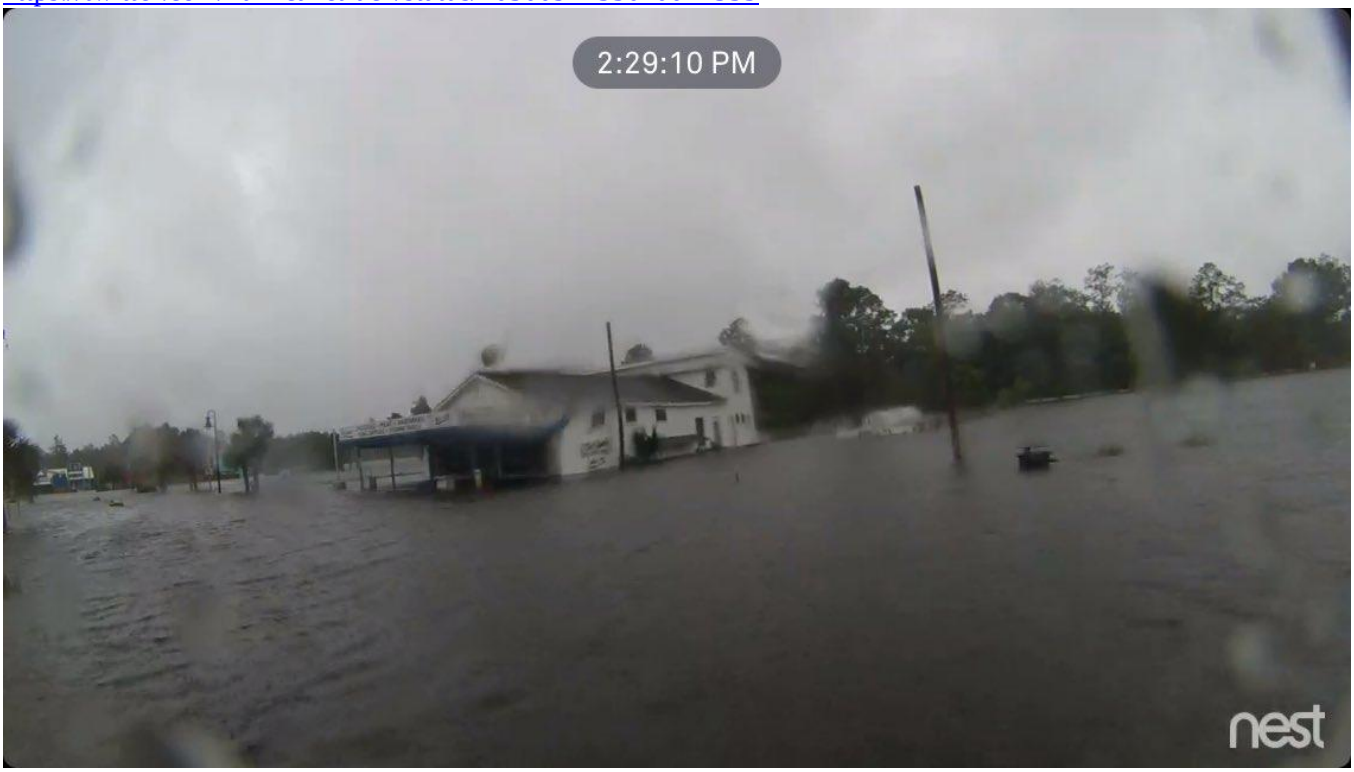
https://abcnews.go.com/US/hurricane-tracker-florida-officials-warn-michael-destructive-storm/story?id=58377692

Franklin County – Lanark Village/Carrabelle

2434 Hwy 98 E, Carrabelle, FL 32322 (Zone VE19, built between 2010-2013)
https://www.instagram.com/p/Bow2yVkHFaV/?taken-by=lanark_fire_department

Wakulla County - St Marks, FL

850 Port Leon Dr, St Marks, FL 32355 (AE 19)
https://twitter.com/hurricanetrack/status/1050091453010071553



https://www.gettyimages.com/detail/news-photo/bo-lynns-market-starts-taking-water-in-the-town-of-saint-news-photo/1048880834

Wakulla County – Shell Point Beach, FL

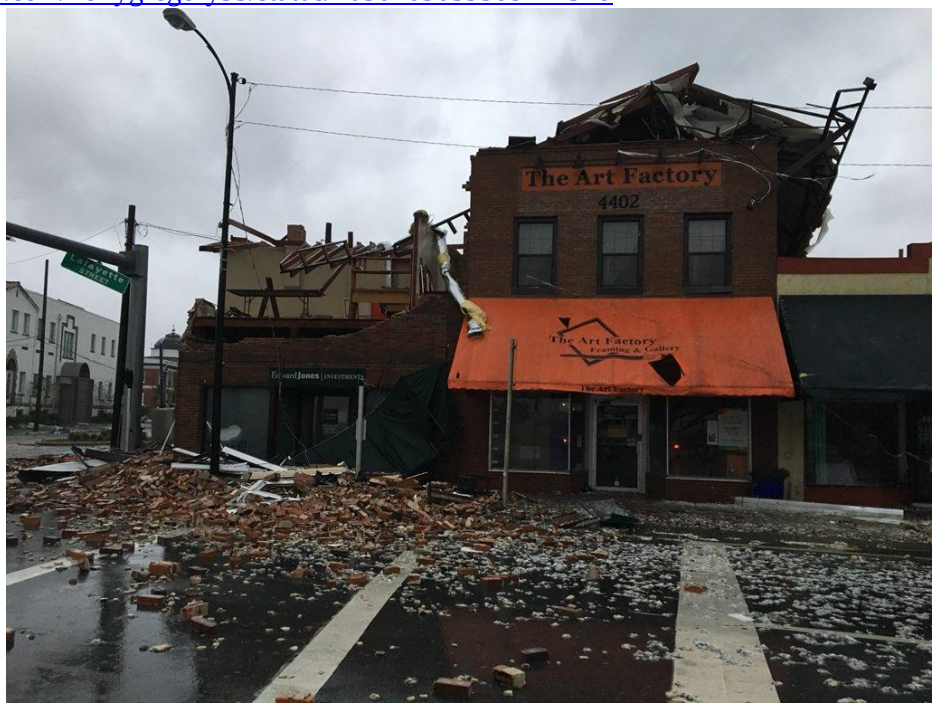
https://www.gettyimages.com/detail/news-photo/the-wind-and-waves-continue-to-pound-the-community-of-shell-news-photo/1051853524

Leon County Tallahassee

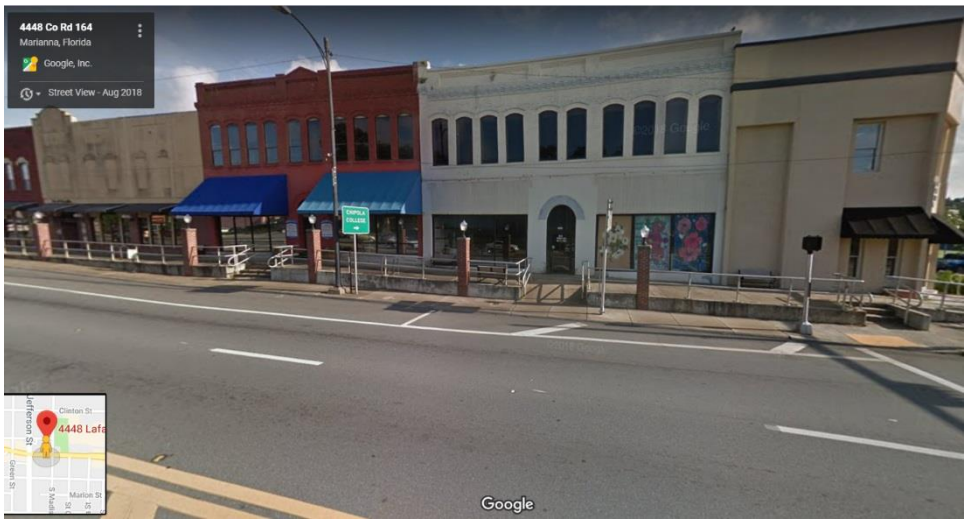
https://twitter.com/TallyPD/status/1050172386878922752

Jackson County – Marianna, FL

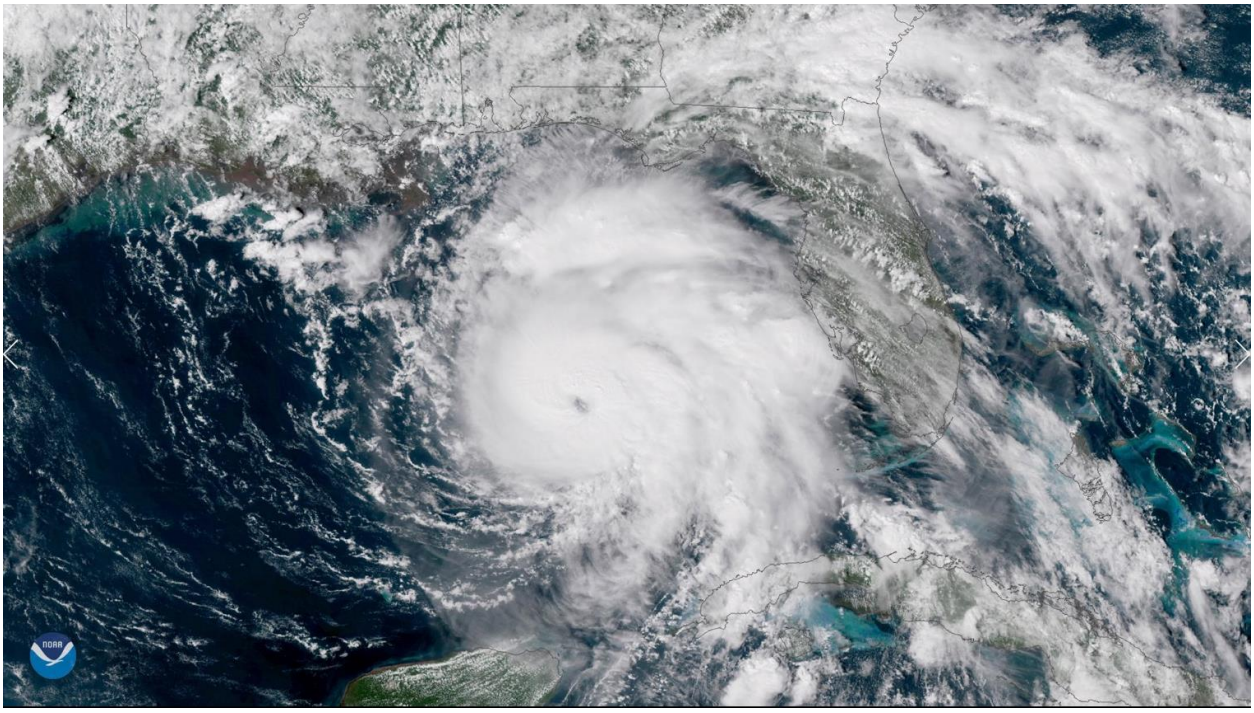
4404 Lafayette St, Marianna, FL 32446
https://twitter.com/hollygregory33/status/1050165039368421376



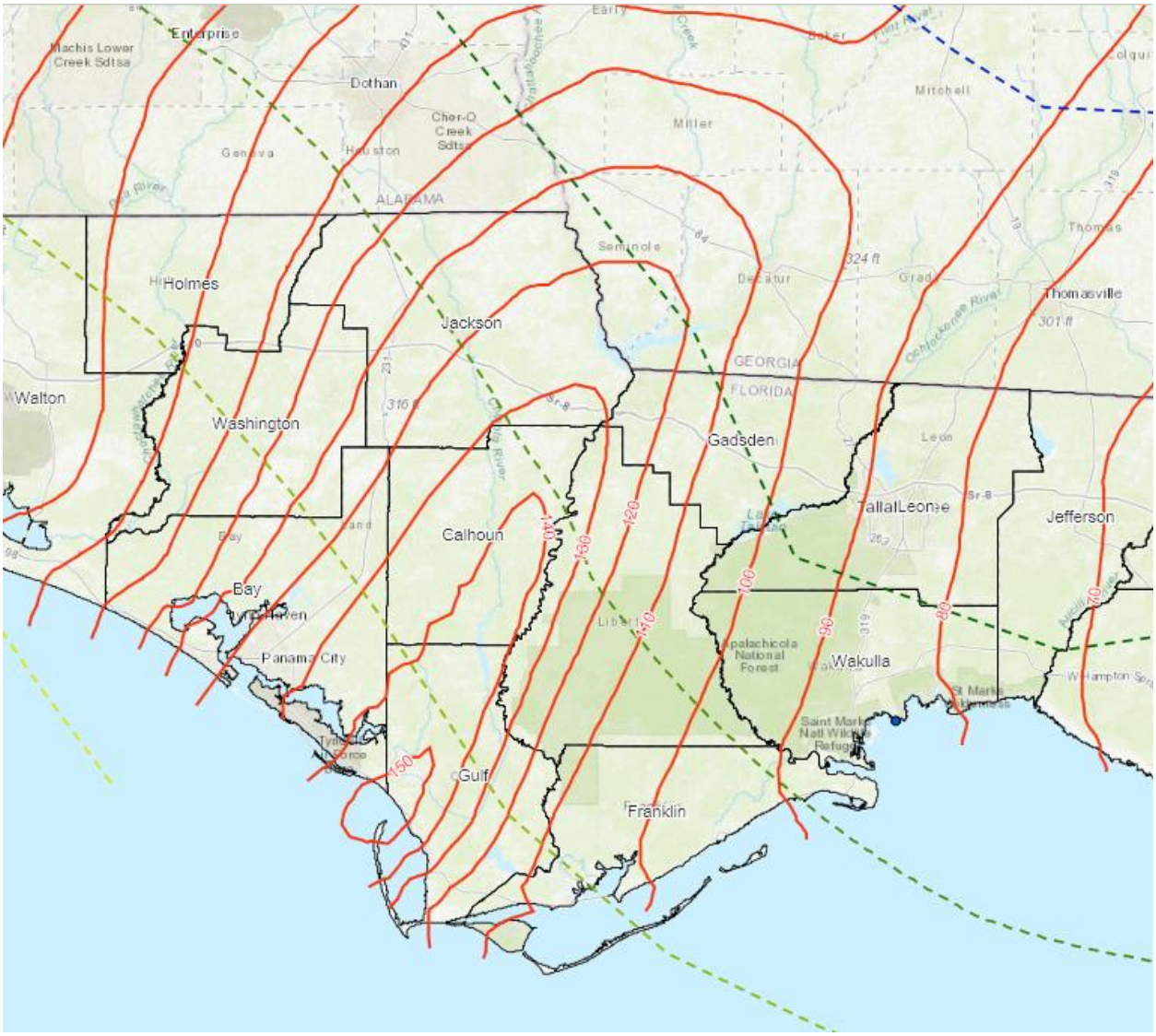
4448 Lafayette St (Co Rd 164), Marianna, FL 32446



Boat storage building - Thompson Drive about 1/2 mile from beach.



This Tuesday, Oct. 9, 2018 satellite image provided by NOAA shows Hurricane Michael, center, in the Gulf of Mexico. (NOAA via AP)



- Coastal Construction Guidance (flood and windborne debris, loads, building envelope, elevation, etc.)
- Illustrate freeboard impact on performance
- Wind retrofits, newer versus older construction
- Assess performance of mitigation projects
- Assess Manufactured Home installation
- Assess performance of hospitals and other critical facilities
- Assess windborne debris impact resistance of envelope, as well as resistance to water intrusion

Upcoming plans

Limitations

Drones

Tyndall AFB

Timeline

Links

USGS Flood Event Viewer – https://stn.wim.usgs.gov/FEV/#Michael2018
USGS Story Map – https://geoplatform.maps.arcgis.com/apps/MapSeries/index.html?appid=1114798afcc244a5a299c0a6bf149016
FEMA Geospatial Coordination – https://fema.maps.arcgis.com/apps/MapSeries/index.html?appid=048d65997322496a8bb6eea3efce4df2
FEMA Geoplatform data - https://disasters.geoplatform.gov/publicdata/NationalDisasters/HurricaneMichael/
Florida Disaster.Org https://www.floridadisaster.org/info/
Florida State Emergency Response Team https://www.floridadisaster.org/sert/
NOAA https://tidesandcurrents.noaa.gov/quicklook/view.html?name=Michael#reload
NOAA Hurricane Michael Imagery https://storms.ngs.noaa.gov/storms/michael/index.html#8/30.209/-85.611