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Hurricane Milton Implications October 9, 2024

A day before the historic Florida west coast landfall of Hurricane Milton, the forecast of hazards and the most impacted locations are increasing in confidence. Milton is invoking comparisons to Hurricane Ian (2022) as well as other infamous 21st century Florida west coast hurricanes including Charley (2004) and Irma (2017). Today's report commences the comparison of Milton to these hurricanes, discusses the ramification of evacuations, reviews mitigation and resiliency efforts to fortify Florida electricity infrastructure and highlights lessons learned in the Guy Carpenter damage survey of Ian conducted in Iate 2002.

Historic West Coast Florida Landfall Tonight

Meteorological Headlines

- Wind: The forecasted landfall intensity of Milton is between 100-120 knots (~115-135 mph). Maximum recorded gusts could exceed 155 mph at coastal locations. The southeast portion of the storm contains the strongest winds. The highest confidence region of landfall is Manatee and Sarasota County, south of Tampa Bay.
- Storm Surge: The forecasted maximum storm surge of Milton is 10-15 feet and the location of peak surge is currently forecasted for the Florida coastline between Sarasota and Port Charlotte (the region southeast of Milton's forecasted landfall location). Coastal communities in Sarasota, Charlotte and Lee counties should prepare for peak storm surge impacts from Milton.
- Rainfall: Milton is forecasted to drop 15+ inches of rain locally in less than 24 hours. The highest totals are forecasted to occur in the regions just northeast of the center of Milton during its traverse across Florida.
 Forecasts suggest that Pinellas, Hillsborough, and Pasco counties will likely avoid large storm surge impacts but are expected to experience the worst precipitation-related flooding.



2PM Wednesday October 9th NHC forecast. Source: National Hurricane Center.



Radar with tornado and flood warnings highlighted. Source: University of Miami / Brian McNoldy.

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Comparing and Contrasting Milton to Other Events

Evacuations

A state of emergency has been issued for 51 out of Florida's 67 counties. Of those, 15 counties have released mandatory evacuation orders with special attention given to individuals in manufactured or mobile homes. For the area of anticipated highest impact, Sarasota County has mandatory evacuations for 122,000 residents, roughly 25% of the county. Initial statistics from the Florida Department of Emergency Management suggests that 5.5 million people were under mandatory or voluntary evacuations in Milton.

Evacuations in Florida are designed by specific zones that are increasingly susceptible to significant wind and storm surge damage. For example, Lee County has mandatory evacuations are in place for Zone A and B, seen in the map to the right. Barrier islands from Fort Myers north through Pinellas County are likely to see significant inundation and thus authorities have gone door to door to ensure the islands are vacated.



The wind fields of notable west coast Florida hurricanes of the 21st century. Due to the unique aspects of each event, evacuation totals varied significantly across the four events.

Source: Kinetic Analysis Corporation, Guy Carpenter.



15 counties home to 7.2 million people were under various levels of evacuation orders. Source: Florida Department of Emergency Management.



Evacuation zones for Lee County, FL. Source: leegov.com.

Damaging West Coast of Florida Hurricanes

Other notable hurricanes this century have seen wide variance in citizens evacuated. Irma was the highest with 6.5 million, in part due to the track running parallel to the coast with multiple scenarios possible. The potential impacts the Tampa metro region before turning east into Fort Myers, Florida, resulted in Hurricane Ian causing over 2.5 million residents to be under mandatory evacuations in 2022. Charley had a notably lower number of evacuations of roughly 1 million residents, in part due to forecast uncertainty and lack of time between evacuation issuance and landfall. Additionally, many residents chose to ignore orders due to lack of experience with major hurricane landfalls.

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The Impact of Fortifying Infrastructure to Wind and Water Damage

Florida has recently taken steps to improve power infrastructure resiliency against hurricanes, utilizing funding from the Resilient Florida Grant Program. One of the most promising upgrades is the implementation of self-healing technologies that automatically reroute electricity around damaged lines, reducing outage times significantly. During Hurricane lan, these technologies helped restore power to over 160,000 customers and saved nearly 3.3 million hours of outage time. Utility companies have also upgraded thousands of poles and wires and have buried power lines in vulnerable areas. Replacing wooden poles with composites improve strength and flexibility which helps power poles endure storm impacts better without breaking.

Hardening investments measurably improve system resiliency, which speeds restoration after hurricanes



Source: Florida Power and Light.



Power outage information since 2017. Source: DOE, Guy Carpenter.



Efforts invoked since the 2004/2005 hurricane seasons to enhance grid resiliency, excludes northwest Florida. Source: Florida Power and Light.

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Milton Occurring on the Heels of Hurricane Helene

A damage multiplier in Hurricane Milton that is a challenge to quantify is the debris left in the wake of Helene. 50% of storm surge damage in Hurricane Helene in September have not yet been cleared from the areas adjoining streets in the region. Given the short time between the 2 storms, a focused effort in the last 72 hours by waste removal and state entities made meaningful progress but was not successful in full removal. Remaining debris significantly increases the risk of wind-borne projectiles and elevated structural damage from floating debris in high velocity surge zones close to the coast.



Contents debris on the street side in Fort Myers Beach three months after Hurricane Ian landfall. Source: Guy Carpenter.

State of Florida Preparation by the Numbers

- 313
 - Health care facilities evacuated
- Florida National Guard 6,000 service members called up
 - Additional out of state law 500 enforcement to policy curfew zones

Florida Building Code Impacts

A Guy Carpenter damage survey on Hurricane Ian (2022) damage revealed mixed impacts from wind and seawater inundation due to storm surge. The areas affected by wind were in the Florida Building Code wind-borne debris regions, with some of the most resilient measures for wind-resistance in the country. Older structures pre-dating these building codes sustained a greater degree of damage with clear damage to roof and even wall materials with clear evidence of rainwater intrusion. Those commercial and residential structures built to more recent codes, particularly post 2004, also showed damage but to a much lesser degree and with fewer cases where the structural envelope was compromised.

2.7M

Gallons of diesel and gasoline ready to deploy post landfall

Percentage of Helene debris removed 50% Percentage of The sector o

23% Percentage or second without fuel pre-landfall Percentage of gasoline stations



Newer construction of a single-family home in the wind-borne debris region of the most recent Florida building code. Located in Bonita Springs Beach, FL, little wind damage transpired while first floor elevation was above the coastal storm surge. Source: Guy Carpenter.

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Storm Surge Lessons from Ian

Hurricane lan's storm surge resulted in a broad spectrum of damages. Structures near adjacent waterways were clearly cases where the interior contents, drywall and appliances all had to be replaced, along with treatment for mold and mildew. Closer to the immediate coast, including the Fort Myers Beach area, the damage was most severe from both seawater inundation and wave battering. Engineered structures showed considerable damage to the first and even the second floor, with evidence of wind damage to higher floors. In the meantime, those older structures on concrete slabs suffered catastrophic damage or had completely washed away.



Home damage from storm surge inundation to older construction. Source: Guy Carpenter.





Older construction that endured significant first floor damage due to storm surge inundation as well as roof damage on Fort Myers Beach (above) and on Estero Island, Florida (left). Source: Guy Carpenter.

About Guy Carpenter

Guy Carpenter, a business of Marsh McLennan (NYSE: MMC), is a leading global risk advisory and reinsurance specialist and broker. Marsh McLennan is a global leader in risk, strategy and people, advising clients in 130 countries across four businesses: Marsh, Guy Carpenter, Mercer and Oliver Wyman. With annual revenue of \$23 billion and more than 85,000 colleagues, Marsh McLennan helps build the confidence to thrive through the power of perspective. For more information, visit guycarp.com, or follow on LinkedIn and X.

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