

THE CAT RESOURCE CENTER







Hurricane Otis

Wednesday, November 1, 2023

After making landfall near Acapulco, Mexico as a category-5 hurricane, Hurricane Otis became the strongest hurricane on record to make landfall along Mexico’s Pacific coast. Packing sustained winds of 165 mph upon landfall, Otis underwent an unexpected period of rapid intensification of 110 mph in 24 hours, resulting in catastrophic damage.

Hurricane Otis NHC Final Landfall Status

Landfall Around 1:25 AM CDT, October 25, 2023

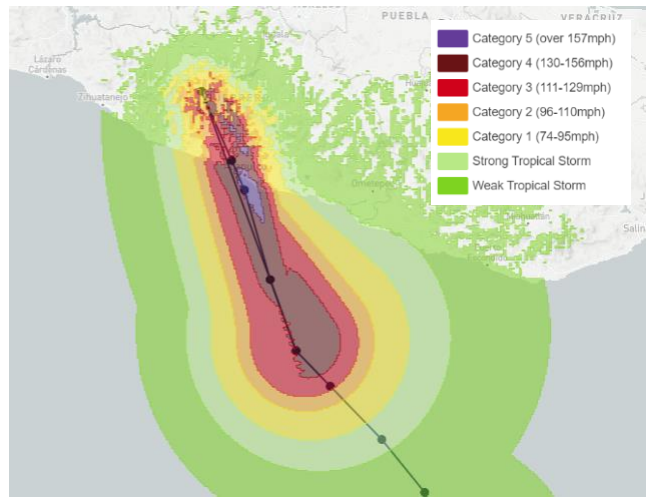
-  Landfall location: Acapulco, Mexico
  Extent of hurricane force winds: 30 miles
Extent of TS force winds: 70 miles
-  Max sustained: 165 mph
Category: 5
  Minimum central pressure: 923 mb
 Forward speed: NNW at 10 mph
-  Peak rainfall amounts: 8-16 inches
Local amounts to 20 inches

Catastrophic Impacts from Category-5 Hurricane

Significant Damage Reported in Acapulco:

Hurricane Otis’s category-5 strength had devastating consequences for Acapulco and the surrounding metropolitan area. The region’s tourism dependent economy which accounts for roughly 30% of the state’s GDP, according to CoreLogic, was ravaged by the storm, with Guerrero state governor Evelyn Salgado stating that roughly 80% of the city’s hotels were damaged. The city’s high rise beachfront hotels and resorts suffered extreme wind impacts and beachfront locations also suffered flooding from storm surge. Damage to these properties, in addition to the luxury home and condominium properties are likely to drive insured losses. Further inland, 8-16” of rain combined with the mountainous topography of the region generated landslides and led to flooding in certain residential areas. Across the state of Guerrero, over 220,000 homes have been reported damaged.

Otis also severed infrastructure and transportation throughout the Acapulco metropolitan area. An estimated 500,000 households lost power. Acapulco International Airport shut down due to damage from the storm, while local automobile transportation was blocked by landslides and damaged roadways. As of November 1, there were 46 reported fatalities and at least 58 additional remain missing.



Estimated Wind Footprint. Source: GC AdvantagePoint, Kinetic Analysis Corporation



Initial impacts in Acapulco. Source: State of Guerrero Government

Publicly Available Loss Estimates

Industry Loss Estimates: Insured loss estimates have been provided for Hurricane Otis from publicly sourced data below. It is anticipated that Otis will be one of the most impactful hurricanes for Mexico’s insurance market.

Source	Date	Loss Estimate (USD Billions)
CoreLogic	10/26	\$10 to \$15 (Insurable – ground up; wind Only, No Business Interruption)
AM Best	10/31	\$1.6 to \$6.5 (Insurance Industry)
Verisk	11/1	\$3 to \$6 (Insurance Industry; Wind and Precip-Induced Flood)

Sources: AM Best, CoreLogic, Verisk; see respective websites for specific inclusions and exclusions from loss estimates

A business of Marsh McLennan

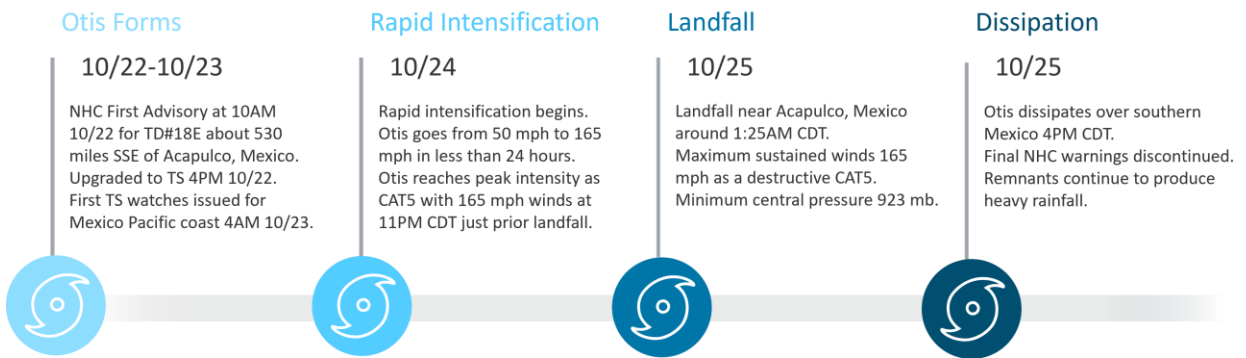
[More information is available at the Guy Carpenter CAT Resource Center.](#)

THE CAT RESOURCE CENTER

Hurricane Otis

Wednesday, November 1, 2023

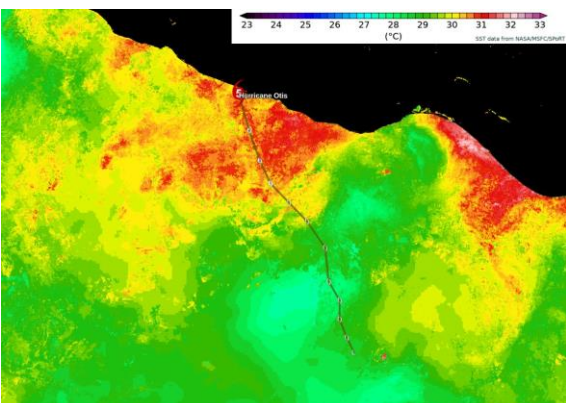
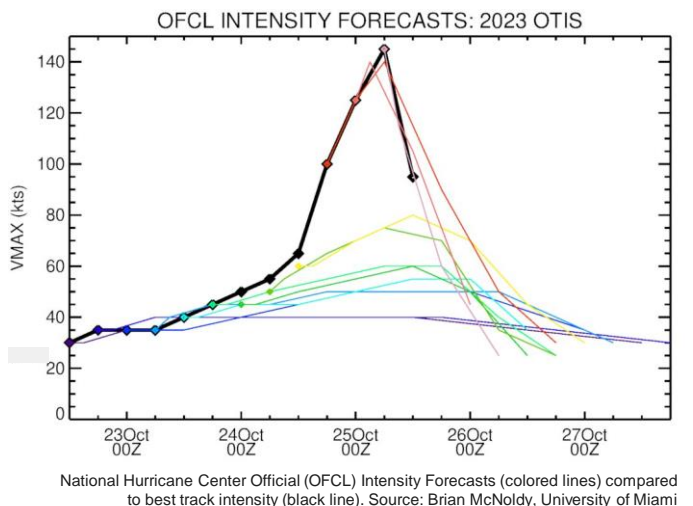
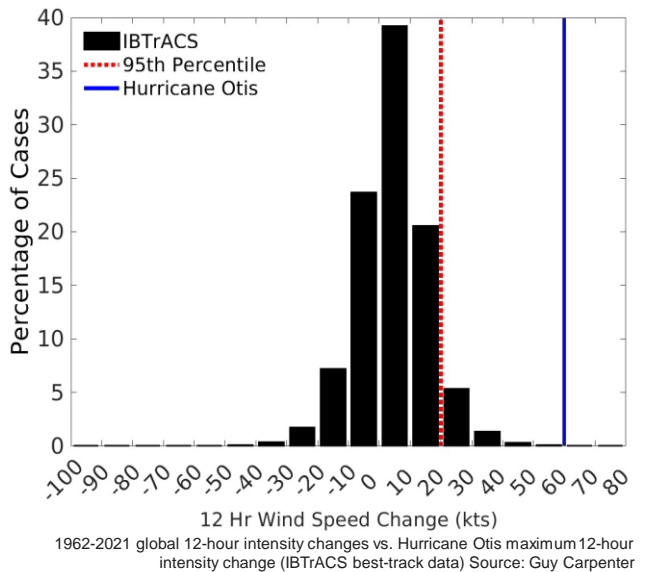
The Timeline of Hurricane Otis



Unexpected Rapid Intensification

Tropical Storm to Category-5 in 24 hours: Before its landfall in Acapulco, Hurricane Otis increased from 75 to 145 mph (category-1 to category-4) in a 12-hour period and 50 mph to 165 mph (tropical storm to category-5) in a 24-hour period. The 12-hour and 24-hour intensity changes only trail Hurricane Patricia (2015) for fastest intensity changes in the East Pacific basin record (IBTrACS best track data). Using global data from the last 60 years, Otis' 12-hour intensity change is in the top ~0.01% of all 12-hour intensity changes.

The extreme intensification occurred when Otis traversed over 30°C+ ocean water on its final approach to Acapulco which coincided with a decrease in wind shear. The extremely moist mid-levels of the atmosphere as well as the anomalously high potential intensity of the environment were also contributing factors to the historic pre-landfall intensification. Even with these conducive environmental variables, hurricane model guidance did not capture the potential for rapid intensification which left communities less prepared. Otis represents yet another example of an increasing trend in tropical cyclones jumping multiple categories before landfall.



Over the last 60 years, Hurricane Otis ranks 10th in 12-hour intensity change (60 knots) among tropical cyclones globally, according to 6-hourly best track data. Hurricane Wilma holds the record with 75 knots, followed by 4 storms with 70 knots and another 4 with 65 knots.

THE CAT RESOURCE CENTER

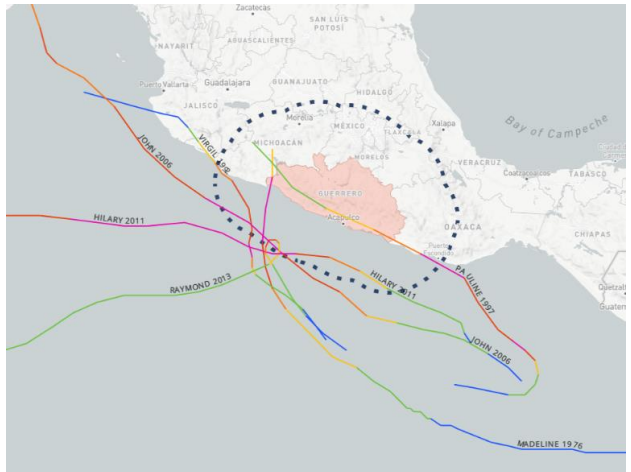
Hurricane Otis

Wednesday, November 1, 2023

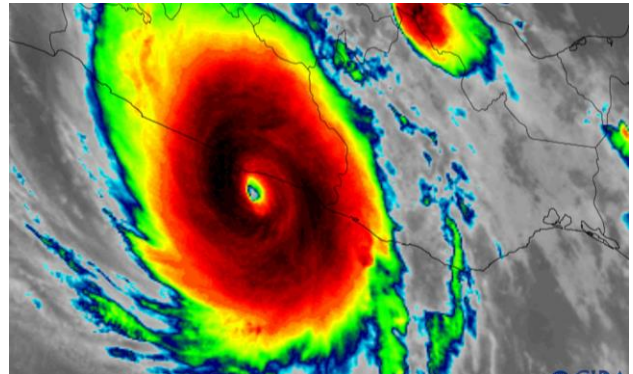
Historical Storm for Pacific Mexico

Hurricane Otis is among the strongest storms in recorded history to impact the Pacific coast of Mexico and the first category-5 storm to make landfall in this region of Mexico. Before Otis, only two storms had made direct landfall within 50 miles of Acapulco, both at category-1 strength. While the city has experienced close calls with bypassing category-2 Hurricane Bridget (1971), and category-4 Hurricane Pauline (1997) which made landfall near Puerto Angel and tracked northwest through southwestern Guerrero, Otis was the first landfalling major hurricane in this area. Only two other category five hurricanes have made landfall anywhere along the Pacific coast of Mexico: Hurricane Kenna (2002) and Hurricane Patricia (2015).

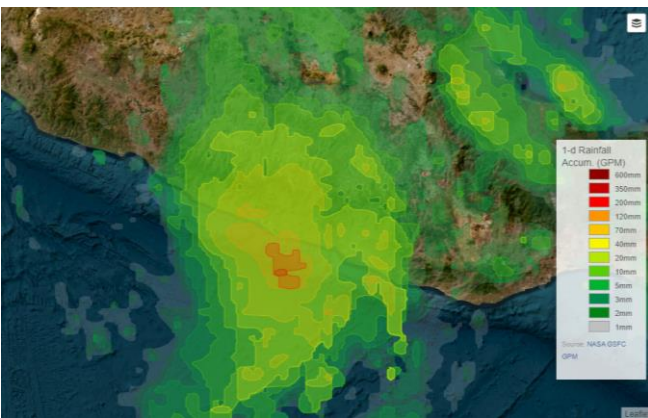
While this region of Mexico sees most of their tropical cyclone activity during September and October, more than 80% of these systems are usually tropical cyclone or low-end hurricane strength. Only three major hurricanes have occurred within 100 miles of Guerrero in the month of October, the most recent landfalling event being Hurricane Pauline (1997).



Observed major hurricanes within 100 miles of Guerrero, Mexico. Source: NOAA



Infrared satellite image of Otis on its approach to Mexico. Source: NOAA/CIRA



1-Day rainfall estimates. Source: NASA/GPM

As a quick moving storm with a narrow track, it is anticipated that the majority of insured loss from Otis will be wind driven, rather than from water (surge, heavy rainfall, flooding). However, due to Mexico's topography inland, localized heavy rainfall from tropical cyclones can often result in landslides and residual flooding, as referenced on page 1. Seen left is a 1-day rainfall accumulation from NASA's Global Precipitation Measurement Mission (GPM), indicating heavy rainfall produced by Otis.

About Guy Carpenter

Guy Carpenter & Company, LLC is a leading global risk and reinsurance specialist with 3,400 professionals in over 60 offices around the world. Guy Carpenter delivers a powerful combination of broking expertise, trusted strategic advisory services and industry-leading analytics to help clients adapt to emerging opportunities and achieve profitable growth. Guy Carpenter is a business of Marsh McLennan (NYSE: MMC), the world's leading professional services firm in the areas of risk, strategy and people. The Company's 86,000 colleagues advise clients in 130 countries. With annual revenue of over \$20 billion, Marsh McLennan helps clients navigate an increasingly dynamic and complex environment through four market-leading businesses including Marsh, Mercer and Oliver Wyman. For more information, visit www.guycarp.com and follow us on LinkedIn and Twitter @GuyCarpenter.

Guy Carpenter & Company, LLC provides this report for general information only. The information contained herein is based on sources we believe reliable, but we do not guarantee its accuracy, and it should be understood to be general insurance/reinsurance information only. Guy Carpenter & Company, LLC makes no representations or warranties, express or implied. The information is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such. Statements concerning tax, accounting, legal or regulatory matters should be understood to be general observations based solely on our experience as reinsurance brokers and risk consultants, and may not be relied upon as tax, accounting, legal or regulatory advice, which we are not authorized to provide. All such matters should be reviewed with your own qualified advisors in these areas.

*Securities or investments, as applicable, are offered in the United States through GC Securities, a division of MMC Securities LLC, a US registered broker-dealer and member FINRA/NFA/SIPC. Main Office: 1166 Avenue of the Americas, New York, NY 10036. Phone: (212) 345-5000. Securities or investments, as applicable, are offered in the United Kingdom by GC Securities, a division of MMC Securities Ltd., which is authorized and regulated by the Financial Conduct Authority. Securities or investments, as applicable, are offered in the European Economic Area by GC Securities, a division of MMC Securities (Ireland) Ltd., which is authorized and regulated by the Central Bank of Ireland, reference number C447471. Reinsurance products are placed through qualified affiliates of Guy Carpenter & Company, LLC. MMC Securities LLC, MMC Securities Ltd., MMC Securities (Ireland) Ltd. and Guy Carpenter & Company, LLC are affiliates owned by Marsh McLennan. This communication is not intended as an offer to sell or a solicitation of any offer to buy any security, financial instrument, reinsurance or insurance product. Readers are cautioned not to place undue reliance on any historical, current or forward-looking statements. Guy Carpenter & Company, LLC undertakes no obligation to update or revise publicly any historical, current or forward-looking statements, whether as a result of new information, research, future events or otherwise. The trademarks and service marks contained herein are the property of their respective owners.