CoreLogic®

# 2021 Hurricane Report

**Contributors**

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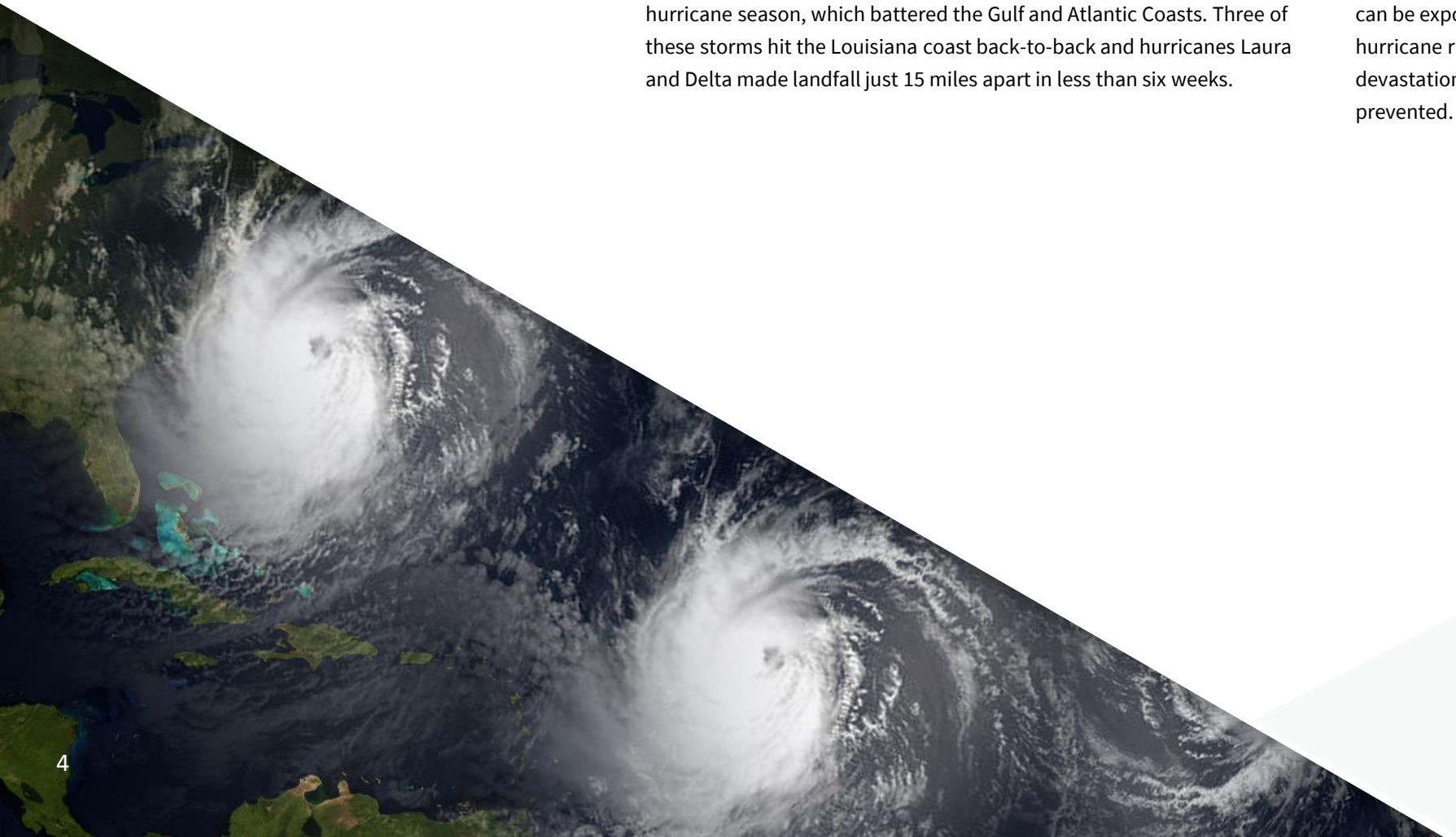
# Introduction

As the 2021 Atlantic hurricane season rolls in, the National Oceanic and Atmospheric Administration (NOAA) has projected a total of 13-20 named storms, 6-10 hurricanes and 3-5 major hurricanes, defined as Category 3 and higher. In 2020, the United States was the ultimate destination for a record high of 30 named storms over the course of the hurricane season, which battered the Gulf and Atlantic Coasts. Three of these storms hit the Louisiana coast back-to-back and hurricanes Laura and Delta made landfall just 15 miles apart in less than six weeks.

The Southwest Louisiana community was devastated. Homes were reduced to slabs. Roofs were missing. And the heat that set in shortly after the storm dissipated meant many homes, rife with water damage, grew mold. This crisis highlighted an important distinction: while hurricanes are devastating for any community, the effects of disasters can be exponentially worse for lower-income areas. In understanding hurricane risk exposure, both today and in the future, financial devastation for insurers, homeowners and communities can be prevented.



# The Human Impact of Hurricanes

The most economically disadvantaged, or those who earn less than half of what their neighbors do, often struggle to afford a home in the first place. Home ownership is a principal form of saving and building wealth, and thus a key to economic mobility. When lower income communities are hit with disaster, it can be even more challenging to recover.

Many lower-income communities may not have the ability to afford insurance, or know their house is at risk of hurricane damage. When homes are destroyed, many uninsured homeowners are left with few options. Damaged homes, often unsuitable for habitation, mean that people are displaced, living in motel rooms and elsewhere and spending money on new, added expenses. Their place of work may be damaged, locking them out of earning income.

In Lake Charles, which was hit by both Hurricane Laura and Hurricane Delta, the average cost to replace a roof was $7,684. Based on the area's median household income, assuming no financial assistance, no insurance, no savings and a 40-hour work week, it would take over two months of labor to accumulate the necessary money to replace the roof — assuming they have no other expenses such as childcare, rent, groceries and gas.

For those who are homeowners, the result of a financial catastrophe results in mortgage delinquency rates increasing significantly as people, crippled by expenses and lost wages, fail to make monthly mortgage payments. After Hurricane Laura made landfall in Lake Charles, the already-high delinquency rate shot up from 9.8% in August 2020 to 16.1% in September 2020, an increase of 6.3 percentage points.



## WHAT HAPPENS TO THE REAL ESTATE ECONOMY AFTER A HURRICANE HITS?

### Mortgage Delinquency Rates

| | |
|---|---|
| **Harvey in Houston, TX (August 25, 2017)** | 6.2% mortgage delinquency rate in August 2017 to 10.9% mortgage delinquency rate by October, an increase of 4.7 percentage points. |
| **Florence in Wilmington, NC (September 14, 2018)** | 3.3% overall (30+ day) mortgage delinquency rate in August 2018 to 6.2% overall delinquency rate in October 2018, an increase of 3.0 percentage points after Florence made landfall. |
| **Michael in Panama City, FL (October 10, 2018)** | 3.9% overall (30+ day) mortgage delinquency rate in September 2018 to 11.3% overall delinquency rate in November 2018, an increase of 7.3 percentage points. |

### Housing Inventory

| | |
|---|---|
| **Harvey in Houston, TX (August 25, 2017)** | -23% change in housing inventory 5 months following the disaster. |
| **Florence in Wilmington, NC (September 14, 2018)** | -26% change in housing inventory 4 months following the disaster. |
| **Michael in and Panama City, FL (October 10, 2018)** | -13% change in housing inventory 2 months following the disaster. |

As climate change continues to reshape the way storms behave, the risk in these hurricane-prone areas will continue to increase. Based on data from NOAA National Centers for Environmental Information, over the past four decades we've seen a 70-90% increase every decade in total inflation-adjusted losses from weather events in the United States — and this trend isn't slowing down. Many of the increases are driven by population migrations from expensive metropolitan areas to high-risk, more affordable coastal areas. These areas are typically low-lying, hurricane prone and especially subject to the climate-related factors at play including, sea level rise, extreme rainfall events and possible increases in hurricane intensity.

The resilience of these coastal communities — high income or low — continues to be a focal point of prevention and preparation. The only way forward is to understand what really is at risk, and educate, prepare and collaborate with everyone who has a stake in the ongoing crisis, including insurance companies, lenders, government agencies and the families on the front line.

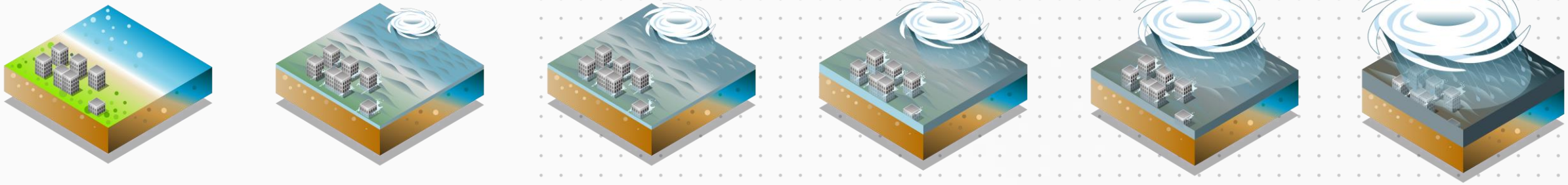
The 2021 Hurricane Report provides insight into property risk, both nationally and by metro area, across single-family homes and multifamily homes from hurricane-driven wind and storm surge. With this knowledge in hand, we can all better protect the homes, families and businesses we love.

# Hurricanes & Climate Change

A tropical cyclone is a rotating low-pressure weather system. When a storm's maximum sustained winds reach 74 mph, it is called a hurricane and they are rated on the Saffir-Simpson Hurricane Wind Scale with a 1 to 5 rating, based on a hurricane's maximum sustained winds.

## A Closer Look

The Saffir-Simpson Scale



**Category 1**
Winds | 74-95 mph
Storm Surge | 4-5 ft.

**Category 2**
Winds | 96-110 mph
Storm Surge | 6-8 ft.

**Category 3**
Winds | 111-130 mph
Storm Surge | 9-12 ft.

**Category 4**
Winds | 131-155 mph
Storm Surge | 13-18 ft.

**Category 5**
Winds | >156 mph
Storm Surge | >18 ft.

The National Hurricane Center has recorded 309 landfalling hurricanes in the U.S. since 1851, or an average of about 18 hurricanes per decade. The long-term average occurrence of hurricane landfalls in the U.S. is a little less than two per year. But each year varies. For example, there were no hurricane landfalls in the U.S. in 2015, but seven hurricanes made landfall in 1980.

Major hurricanes (Category 3 or greater) are responsible for the majority of onshore damage and arrive at a rate of less than one per year. A look at common major hurricane property damages:

- Elevated waves and coastal surge flood and tear apart properties on the coast.
- Inland precipitation and wind forces water upstream, bringing flooding inland, damaging interior walls, flooring and contents of homes.
- Devastating winds and wind-borne debris causes significant damage to property roofs, windows and other exterior structures.

The damage from extreme events like Hurricane Katrina (2005) and Hurricane Harvey (2017) can exceed $100 billion, not to mention at least 1,833 lives lost during Katrina and 68 during Harvey. Coastal concentrations of population and property in South Florida and Houston, Texas are always a concern, but devastating hurricanes can impact the U.S. states along the Gulf of Mexico and the Atlantic Ocean seaboard.

Climate change is affecting the characteristics of hurricanes in the basins that impact the U.S.

> The 2017, 4th (U.S.) National Climate Assessment notes, "**neither global efforts to mitigate the causes of climate change nor regional efforts to adapt to the impacts currently approach the scales needed to avoid substantial damages to the U.S. economy, environment, and human health and well-being over the coming decades".**[1]

The key aspects of change in hurricane risk come from: sea-level rise, increased tropical cyclone rainfall rates, increasing tropical cyclone frequency rates and an expectation that "the global proportion of tropical cyclones that reach very intense (Categories 4 and 5) levels will likely increase due to anthropogenic warming over the 21st century." [2] Sea-level rise and tropical cyclone precipitation escalate the flood risk (coastal and inland) component of the damage from hurricanes and the intensification of hurricanes presents greater risk to structures exposed to these winds.

As hurricanes grow stronger, property losses will continue to mount and the insurance industry will see increased financial implications as wind damages are covered by standard homeowners insurance policies. Hurricane Andrew (1991) was a powerful Category 5 storm that impacted Miami, Florida. Despite very high storm surge levels, the bulk of the more than $20 billion in damages from that event were caused by devastating winds. Similarly, Hurricane Ike (2008) was a strong hurricane that impacted Houston, Texas and the damage was primarily caused by winds.

While flood insurance adoption inside the Special Flood Hazard Areas designated by FEMA is strong, it's rarely purchased outside of those zones. This means many unsuspecting homeowners could be left with little-to-no protection in recovery from intensifying hurricane seasons. Hurricanes Katrina and Harvey caused tens of billions in flood and water damages alone.

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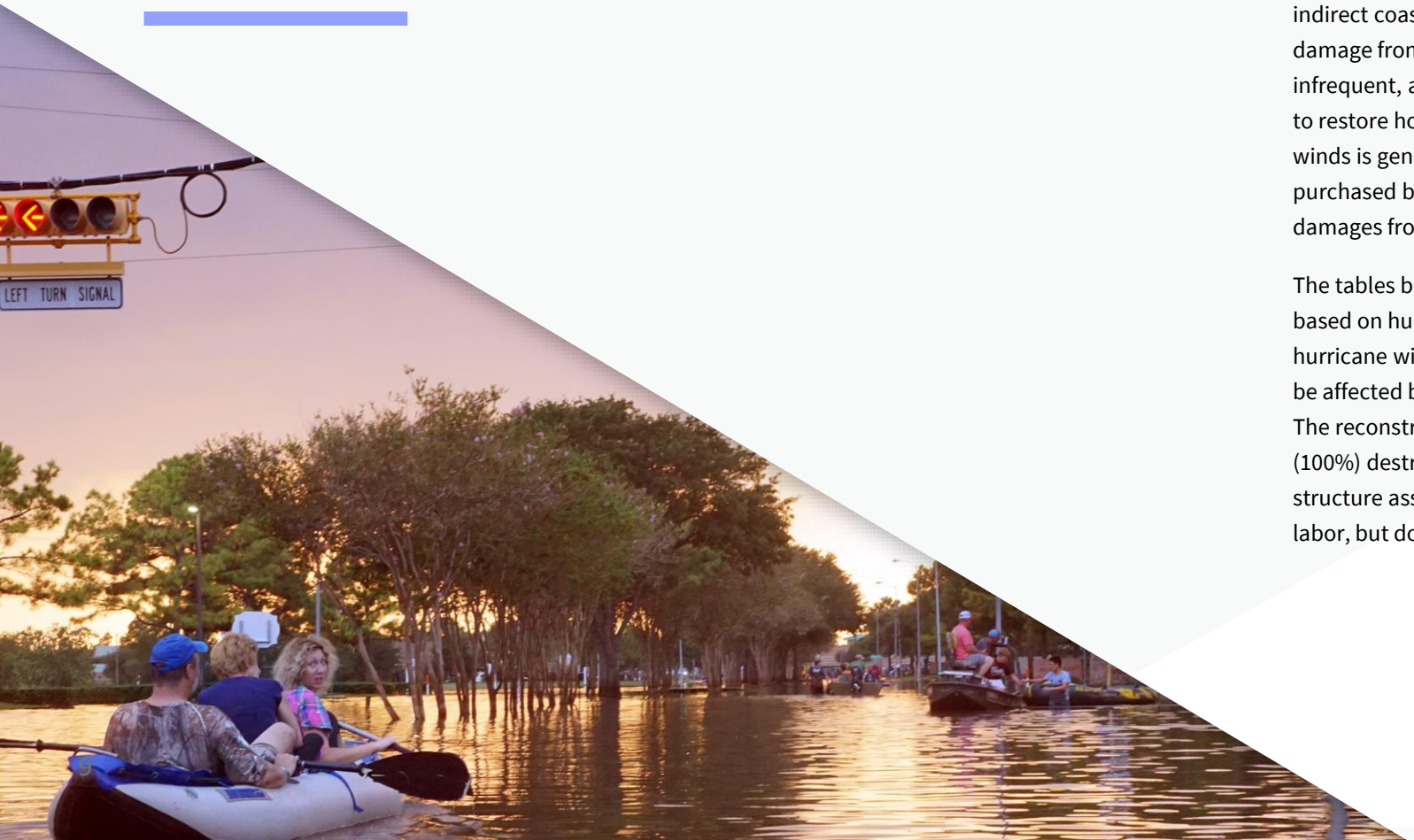
[1] *https://nca2018.globalchange.gov/chapter/1/*

[2] *https://www.gfdl.noaa.gov/global-warming-and-hurricanes/*

# National Analysis

## Nearly 8M Homes at Risk of Hurricane Storm Surge, Over 31M Homes at Moderate or Greater Risk of Hurricane Winds




CoreLogic evaluated the storm surge and hurricane wind risk levels for both single-family (SFR) and multifamily (MFR) residences along the Gulf and Atlantic coasts for the 2021 hurricane season.

CoreLogic identified more than 31 million single-family homes (and almost 1 million more homes in multi-unit buildings) that were at moderate or greater risk from the damaging winds of a hurricane. Almost 8 million of these homes had direct or indirect coastal exposure and subsequent risk from coastal storm surge and damage from hurricanes. For any one community, hurricane losses are severe and infrequent, and homeowners primarily rely on the availability of insurance proceeds to restore homes and support community resilience goals. Damage from hurricane winds is generally insured for most homes, but flood insurance is not uniformly purchased by homeowners. Studies by CoreLogic have shown that up to 70% of the damages from flood to homes is uninsured.

The tables below represent the number of homes at varying levels of surge risk based on hurricane categories and the number of homes at varying levels of hurricane wind risk based on wind risk levels. It is an analysis of which homes could be affected by varying category storms that could occur this year or in coming years. The reconstruction cost value (RCV) figures are based on an assumption of total (100%) destruction of the structure, or the cost to completely rebuild the existing structure assuming total destruction. The RCV combines materials, equipment and labor, but does not include the value of the land or lot.

## 2021 STORM SURGE RISK NUMBERS FOR THE GULF AND ATLANTIC COASTS

| Storm Surge Risk Level (Storm Category) | Total Homes (SFR) Potentially Affected | Total Estimated RCV (U.S. Dollars in Billions) | Total Homes (MFR) Potentially Affected | Total Estimated RCV (U.S. Dollars in Billions) |
|---|---|---|---|---|
| **Category 1** | 1,309,160 | $327.55 | 41,662 | $16.56 |
| **Category 2** | 2,754,989 | $701.93 | 94,101 | $39.14 |
| **Category 3** | 4,420,104 | $1,104.02 | 150,212 | $61.34 |
| **Category 4** | 6,462,072 | $1,611.27 | 221,920 | $92.54 |
| **Category 5** | 7,487,405 | $1,829.84 | 246,136 | $98.57 |

*Data is cumulative (e.g. Category 3 will also include Categories 1 and 2. All Category 5 potential homes affected will also be susceptible to Category 1, so Category 5 encompasses all).*

*It should be noted that many multifamily residences tend to be multiple stories and upper stories are less affected by storm surge flooding. In addition to conventional homes, the single-family structures include mobile homes, duplexes, manufactured homes and cabins. The multifamily homes are apartments, condominiums and multi-unit dwellings.*

## 2021 WIND RISK NUMBERS FOR THE GULF AND ATLANTIC COASTS

| Hurricane Wind Risk Level | Total Homes (SFR) Potentially Affected | Total Estimated RCV (U.S. Dollars in Billions) | Total Homes (MFR) Potentially Affected | Total Estimated RCV (MFR) (U.S. Dollars in Billions) |
|---|---|---|---|---|
| **Extreme** | 6,197,146 | $1,323.43 | 120,815 | $33.60 |
| **Very High or Greater** | 14,365,874 | $3,219.63 | 226,310 | $67.47 |
| **High or Greater** | 21,725,272 | $5,406.02 | 619,567 | $253.82 |
| **Moderate or Greater** | 31,288,878 | $8,081.11 | 953,257 | $413.47 |

*Data is cumulative (i.e. High or Greater will also include Very High or Greater and Extreme. Moderate or Greater encompasses all).*

# Metro Analysis

The review of the risk counts by metro area tells the story of the varying risk profiles of the communities where we live. Our review highlights over 3 million homes in the New York City metro area at risk of damage from hurricane winds, and the almost 800 thousand homes (about quarter of the total) at risk of storm surge flooding. In the Tampa Bay, Florida metro area, 1.1 million homes are at risk from hurricane winds but almost half of them are also exposed to storm surge flooding. Increasing sea levels influenced by climate change will bring a greater frequency and severity of storm surge flooding to exposed communities. And those communities with a large number of homes at risk to surge will also be more sensitive to the effects of climate change. Granular data and analytics can help us identify those homes most at risk, enabling us the opportunity to fortify those homes.

> **SFR and MFR properties in the top 15 metropolitan areas account for 68.3% of the surge risk RCV total in the U.S. in 2021.**

Population densities in these metro areas affect risk assessment. A lower category hurricane in a densely-populated metro area is likely to do much more damage than a higher category storm in a less-densely-populated area. And even within a metro area, some homes will be at less risk due to changes in elevation and barriers to the inland flow of water.

## 2021 STORM SURGE AND HURRICANE WIND RISK NUMBERS FOR SINGLE-FAMILY RESIDENTIAL FOR TOP 15 METRO AREAS

| Rank | Metropolitan Area | Total (SFR) Homes at Risk of Storm Surge | Total Estimated RCV for Storm Surge (U.S. Dollars in Billions) | Total (SFR) Homes at Risk of Hurricane Wind | Total Estimated RCV for Hurricane Wind (U.S. Dollars in Billions) |
|---|---|---|---|---|---|
| **1** | New York City | 781,823 | $304.50 | 3,378,397 | $1,430.10 |
| **2** | Miami | 738,994 | $149.26 | 1,997,608 | $406.28 |
| **3** | Tampa, FL | 544,433 | $100.80 | 1,102,691 | $218.14 |
| **4** | New Orleans | 396,870 | $100.59 | 424,460 | $107.52 |
| **5** | Virginia Beach, VA | 395,653 | $94.95 | 578,622 | $140.62 |
| **6** | Fort Myers, FL | 321,940 | $67.02 | 348,965 | $72.23 |
| **7** | Bradenton, FL | 284,828 | $57.46 | 373,133 | $79.19 |
| **8** | Houston | 261,103 | $56.89 | 1,987,408 | $494.62 |
| **9** | Jacksonville, FL | 220,301 | $52.71 | 548,161 | $123.33 |
| **10** | Naples, FL | 197,265 | $44.46 | 201,314 | $45.08 |
| **11** | Charleston, SC | 184,563 | $46.82 | 275,321 | $65.22 |
| **12** | Boston | 159,245 | $53.98 | 1,289,430 | $477.06 |
| **13** | Myrtle Beach, SC | 156,161 | $30.43 | 247,907 | $49.65 |
| **14** | Lafayette, LA | 146,254 | $33.41 | 179,528 | $40.05 |
| **15** | Baton Rouge, LA | 136,951 | $34.27 | 299,849 | $71.08 |

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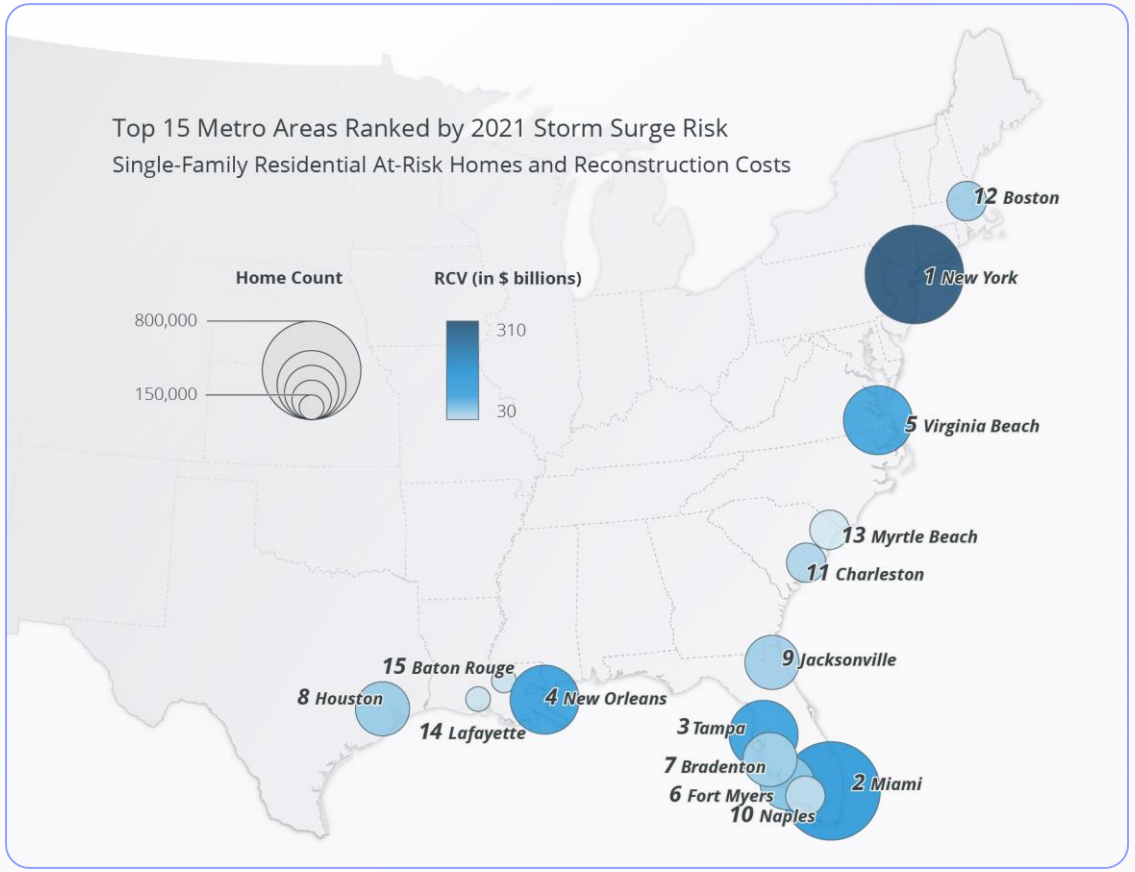
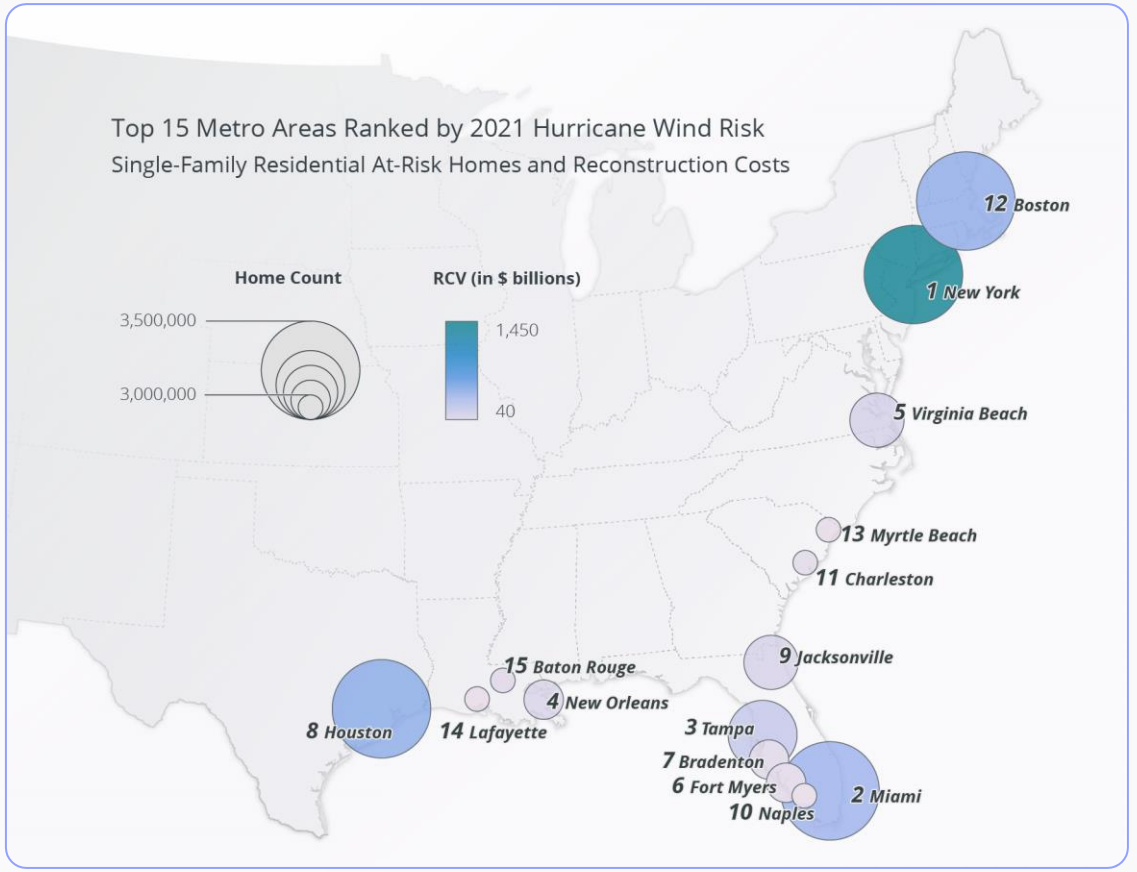
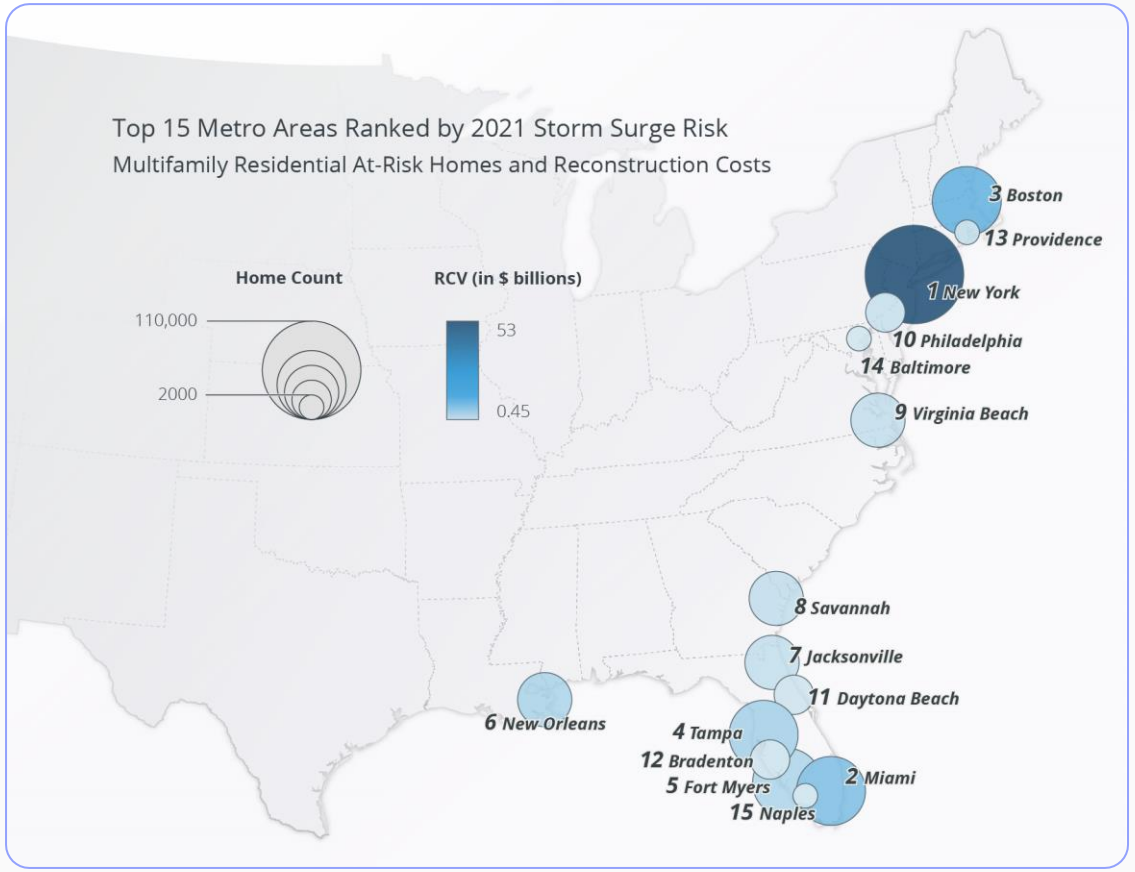


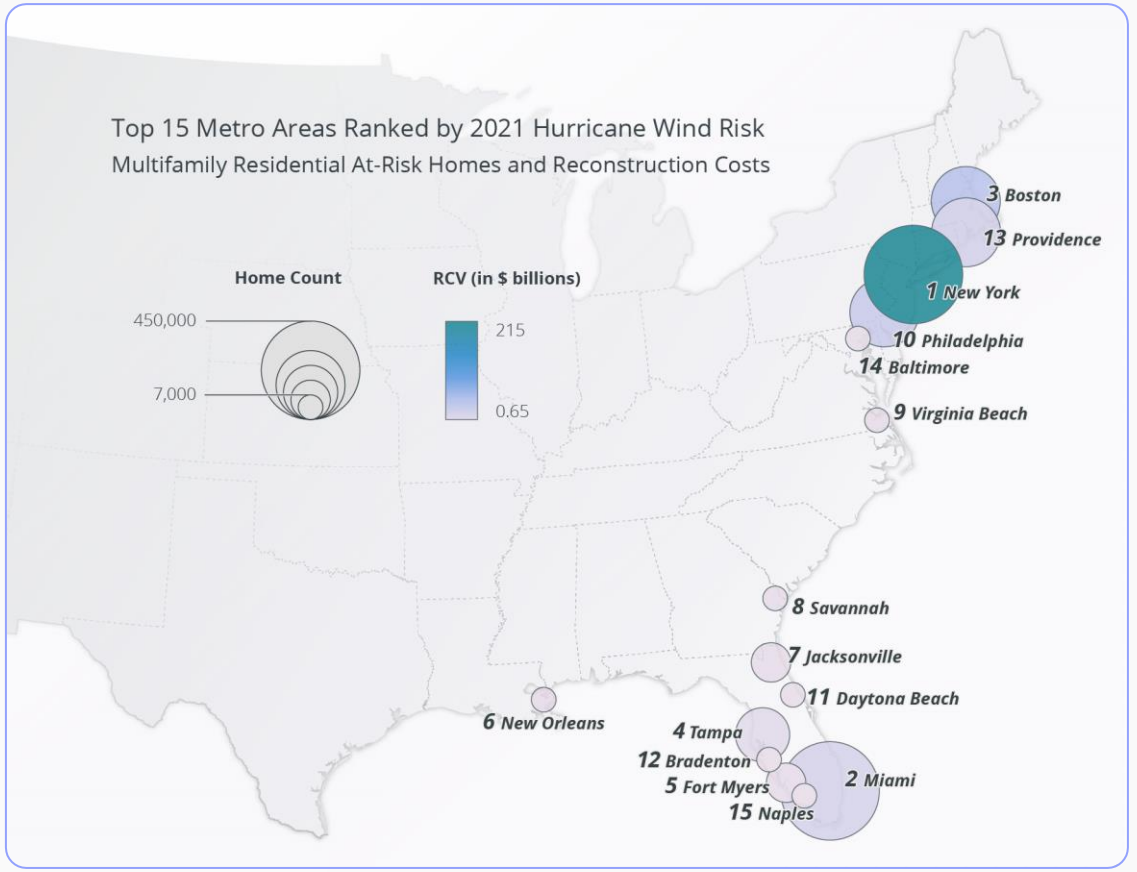



## 2021 STORM SURGE AND HURRICANE WIND RISK NUMBERS FOR MULTIFAMILY RESIDENTIAL FOR TOP 15 METRO AREAS

| Rank | Metropolitan Area | Total (MFR) Homes at Risk of Storm Surge | Total Estimated RCV for Storm Surge (U.S. Dollars in Billions) | Total (MFR) Homes at Risk of Hurricane Wind | Total Estimated RCV for Hurricane Wind (U.S. Dollars in Billions) |
|---|---|---|---|---|---|
| **1** | New York City | 108,607 | $52.04 | 448,051 | $213.78 |
| **2** | Miami | 28,747 | $7.04 | 61,458 | $16.28 |
| **3** | Boston | 14,548 | $9.14 | 58,943 | $37.73 |
| **4** | Tampa, FL | 14,220 | $3.86 | 26,239 | $6.85 |
| **5** | Fort Myers, FL | 13,417 | $3.29 | 14,248 | $3.49 |
| **6** | New Orleans | 6,518 | $3.38 | 6,518 | $3.38 |
| **7** | Jacksonville, FL | 4,495 | $1.48 | 8,643 | $2.75 |
| **8** | Savannah, GA | 4,479 | $1.63 | 4,511 | $1.64 |
| **9** | Virginia Beach, VA | 4,244 | $1.42 | 5,015 | $1.67 |
| **10** | Philadelphia | 3,397 | $1.26 | 53,927 | $25.02 |
| **11** | Daytona Beach, FL | 3,289 | $0.85 | 5,159 | $1.26 |
| **12** | Bradenton, FL | 3,279 | $0.88 | 3,739 | $1.00 |
| **13** | Providence, RI | 2,544 | $1.48 | 32,960 | $19.13 |
| **14** | Baltimore | 2,221 | $0.45 | 4,672 | $1.12 |
| **15** | Naples, FL | 2,206 | $0.63 | 2,350 | $0.66 |

## 2021 STORM SURGE AND HURRICANE WIND RISK NUMBERS FOR SINGLE-FAMILY RESIDENTIAL FOR TOP 15 METRO AREAS



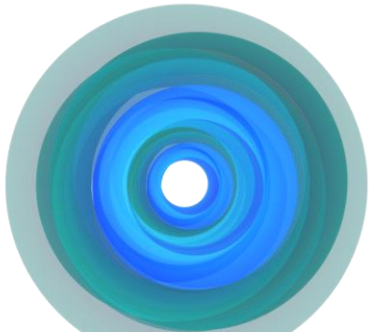
# The CoreLogic Mission: Loss Prevention

While we can't control the occurrence of natural disasters like hurricanes, we can prepare for them. Understanding the risk to help accelerate recovery is the key to resilience.

For the entire housing ecosystem, the focus of concern is shifting from loss adjudication to loss prevention and avoidance. While climate change and increased customer expectations create an unpredictability in how insurers, lenders and the housing finance ecosystem can offer their products, those not being proactive in changing processes and technology can easily fall behind. However, by leveraging granular data, they can not only see through the lens of risk management and loss prevention, but also help customers improve their own experience.

World-class software, data, science and AI are enabling insurers, lenders, and the housing finance ecosystem to define and transform their markets and successfully address the challenges of our changing climate and population demographics. To help mitigate the effects of hurricanes and other natural disasters, it is important to support community resilience goals and understand the risk faced by those impacted.

As hurricanes wreak havoc on communities across the coast, it's more important than ever to protect the homes, families and businesses we love.



# Methodology

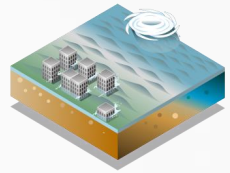
The analysis in the 2021 Hurricane Report encompasses single-family residential structures less than four stories, including mobile homes, duplexes, manufactured homes and cabins (among other non-traditional home types). It also encompasses multifamily structures, which include apartments, condominiums and multi unit dwellings.

It is important to note that the inclusion of high-rise residential units such as those listed above may skew both the numbers associated with storm surge risk. This is because lower level units are most likely to be affected, whereas the units above the second floor will rarely, if ever, experience storm surge flood damage.

Year-over-year changes between the number of homes at risk and the RCV can be the result of several variables, including new home construction, improved public records, enhanced modeling techniques, fluctuation in labor, equipment and material costs and even a potential rise in sea level. For that reason, direct year-over-year comparisons should be warily considered. To estimate the value of property exposure of single-family residences, CoreLogic uses its RCV methodology, which estimates the cost to rebuild the home in the event of a total loss and is not to be confused with property market values or new construction cost estimation. Reconstruction cost estimates more accurately reflect the actual cost of damage or destruction of residential buildings that would occur from hurricane-driven storm surge and wind, since they include the cost of materials, equipment and labor needed to rebuild. These estimates also factor in geographical pricing differences (although actual land values are not included in the estimates). The values in this report are based on 100% percent (or “total”), destruction of the residential structure. Depending on the amount of hurricane-driven storm surge and wind from a given storm, there may be less than 100% damage to the residence, which would result in a lower realized RCV.

To evaluate storm surge and hurricane wind risk at the local level, CoreLogic uses the designation of CBSAs, which are often referred to as metropolitan areas (>50,000 people), or micropolitan areas (<50,000 people). The CBSA represents an urban center and the adjacent regions that are socioeconomically tied to that center. The specific areas identified in this report are named by primary urban center, though each may contain additional urban areas.

The high-resolution, granular modeling for underwriting individual risk allows enhanced understanding of the risk landscape and damage potentials. CoreLogic offers high-resolution solutions with a view of hazard and vulnerability consistent with the latest science for more realistic risk differentiation. By using high resolution land elevation data, CoreLogic is able to determine the elevation of a single structure on a property parcel. Part of a parcel may be lower elevation susceptible to storm surge, while the home is on a slightly higher part of the parcel and not at risk. With this high resolution elevation, CoreLogic can more accurately identify the higher elevation for the homes over the lower parts of the parcel.



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