ANDREW 2.0

A REIMAGINED INSURANCE INDUSTRY

This August marks the 30-year anniversary of Hurricane Andrew, one of the most infamous U.S. landfalling tropical cyclones in recorded history. Although the brunt of Andrew's impact was borne by the South Florida residents whose homes were in the direct path of Category 5 hurricane wind speeds, the effects rippled out far beyond into other industries.

The probability of another Category 5 hurricane landfall in or near Miami is real and given the exponential development in the area over the past 30 years, CoreLogic looks to estimate the magnitude of the impacts of another Andrew-type storm today.

ABOUT THE STORM

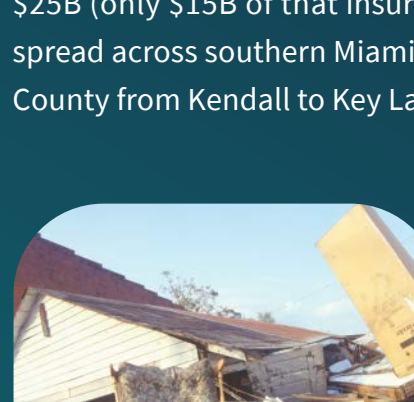
Hurricane Andrew reached hurricane status on August 22, 1992, and 36-hours later it strengthened into a major hurricane, hovering between Categories 4 and 5[1]. It was the first named storm of the 1992 Hurricane Season. By this point, Hurricane Andrew was tracking west over the Bahamas, with Miami-Dade County directly in its path.

On August 24 at 4:40 am local time, Hurricane Andrew made its first US landfall as a Category 5 storm over Elliot Key on the southeastern edge of Biscayne Bay. 30-minutes later, it reached Homestead, a city just under 30 miles from downtown Miami. A reanalysis of Hurricane Andrew concluded that maximum sustained wind speeds of 150 mph with gusts up to 170 mph tore through South Florida[2].

IMPACTS OF HURRICANE ANDREW IN 1992

Damage and Loss

Hurricane Andrew was the strongest storm to impact the U.S. since Camille in 1969. Economic damages (in 1992 dollars) in Florida alone were $25B (only $15B of that insured), spread across southern Miami-Dade County from Kendall to Key Largo.



The average loss from a U.S. landfalling hurricane from 1965 through 1991 was $2B, and the largest only $7B (Hurricane Hugo in 1989) (Figure 1)[3]. Insurers, who had up until 1992 maintained profitable loss ratios (ratio of claims paid to premium collected) and adequate reserves did not anticipate the possibility of Andrew-like losses from a single event.

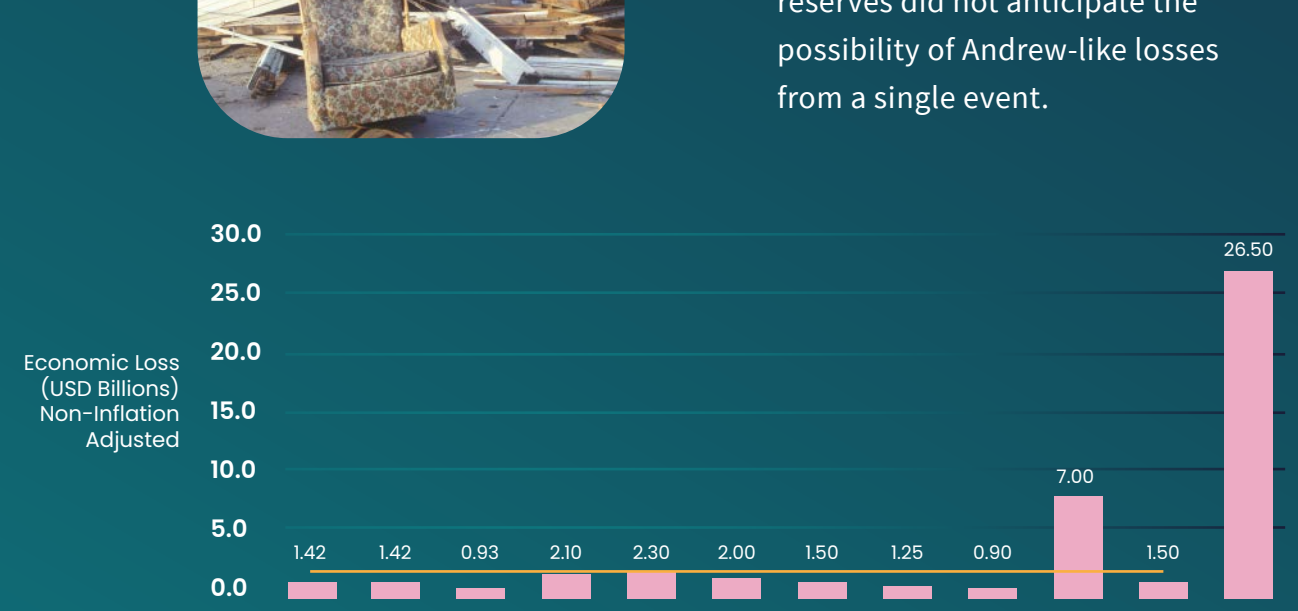


Figure 1: Costliest U.S. hurricanes from 1965 until Andrew. The average during that period was approximately $2B. Losses are not adjusted to 2022 values. Source: NHC 2011

Effect on the Insurance Market and Risk Modeling Industries

The resulting impact of Hurricane Andrew was tumultuous for the property insurance market. The severity of claims was material enough to force seven domestic insurance companies (those domiciled in Florida) and one foreign company into insolvency[4]. Several others required additional capital from parent companies to cover claims and avoid total insolvency.

The effects were felt worse still by the policy holders, who, in addition to having their homes leveled, either had their policies non-renewed or were subjected to unaffordable rate increases, requiring state lawmakers to step in.

The risk modeling industry evolved rapidly in the wake of Hurricane Andrew. Prior to Andrew, many (re)insurers relied on rule-of-thumb methodologies for calculating the reserves necessary to cover potential claims.

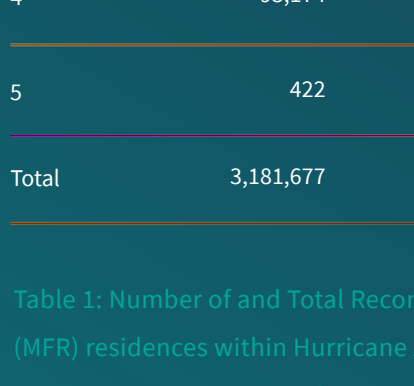
These methods relied on premium totals and historical loss experience, which greatly underestimating their portfolio's risk. Probabilistic catastrophe models were still in their infancy. The models did not rely on limited loss experience and premium collected. Rather they employed knowledge of the physical characteristics that comprised insurers' portfolios and utilized simulated hurricane events of all sized and intensities to estimate the full spectrum of potential loss and the probability of that loss occurring.

Before Hurricane Andrew, catastrophe modelers insisted that the reality of a $10+B hurricane event was possible. Unfortunately, it was not until after that industry professionals realized the importance of accurately measuring risk.

IMPACTS OF ANOTHER HURRICANE ANDREW IN 2022?

The question that South Floridians, industry professionals, local, state and federal officials are most interested in is: What would be the impact of another Hurricane Andrew today?

In the following sections, CoreLogic estimates the number and total reconstruction value (RCV) of single-(SFR) and multifamily residences (MFR) in Miami-Dade County at-risk to another Hurricane Andrew, as well as the industry insured loss from such an event.



Number of and total reconstruction value of residential structures at-risk

CoreLogic estimated that 3.7 million SFRs and MFRs, with a total RCV of $909.3B, would be within Hurricane Andrew's wind-field if history repeated itself in 2022. This analysis includes SFRs less than four stories, mobile homes, duplexes, manufactured homes, and cabins, as well as MFRs such as apartments, condominiums, and multi-unit dwellings.

Table 1 below presented the number of and RCV of SFR and MFR by Saffir-Simpson category. Nearly 120k SFR and MFRs would be subjected to wind speeds surpassing 130 mph (Category 4 and greater), which are severe enough for material building damage.

Saffir-Simpson Category	SFR Count	SFR Total RCV ($Billion)	MFR Count	MFR Total RCV ($Billion)	Total Count	Total RCV ($Billion)
Tropical Storm	2,722,727	688.7	362,177	80.1	3,084,904	768.7
1	199,634	43.1	46,081	10.6	245,715	53.7
2	66,030	15.1	26,442	6.2	92,472	21.4
3	97,690	23.3	29,516	7.0	127,206	30.3
4	95,174	30.3	22,165	4.5	117,339	34.8
5	422	0.3	385	0.1	807	0.4
Total	3,181,677	800.8	486,766	108.5	3,668,443	909.3

Table 1: Number of and Total Reconstruction Value (RCV) of single-family (SFR) and multifamily (MFR) residences within Hurricane Andrew's wind field. Values are presented by Saffir-Simpson Category. Source: CoreLogic 2022

Modeled industry insured loss

CoreLogic estimated that insured losses from another Hurricane Andrew (Florida only) would surpass $70.1B from wind alone with an additional $2.7B of loss from coastal flooding (i.e. storm surge). This analysis leveraged CoreLogic's Insured Exposure Data (IED) and North Atlantic Hurricane Model to estimate the industry-wide impact. Table 2 below details insurable and insured losses from Hurricane Andrew by line of business (LOB).

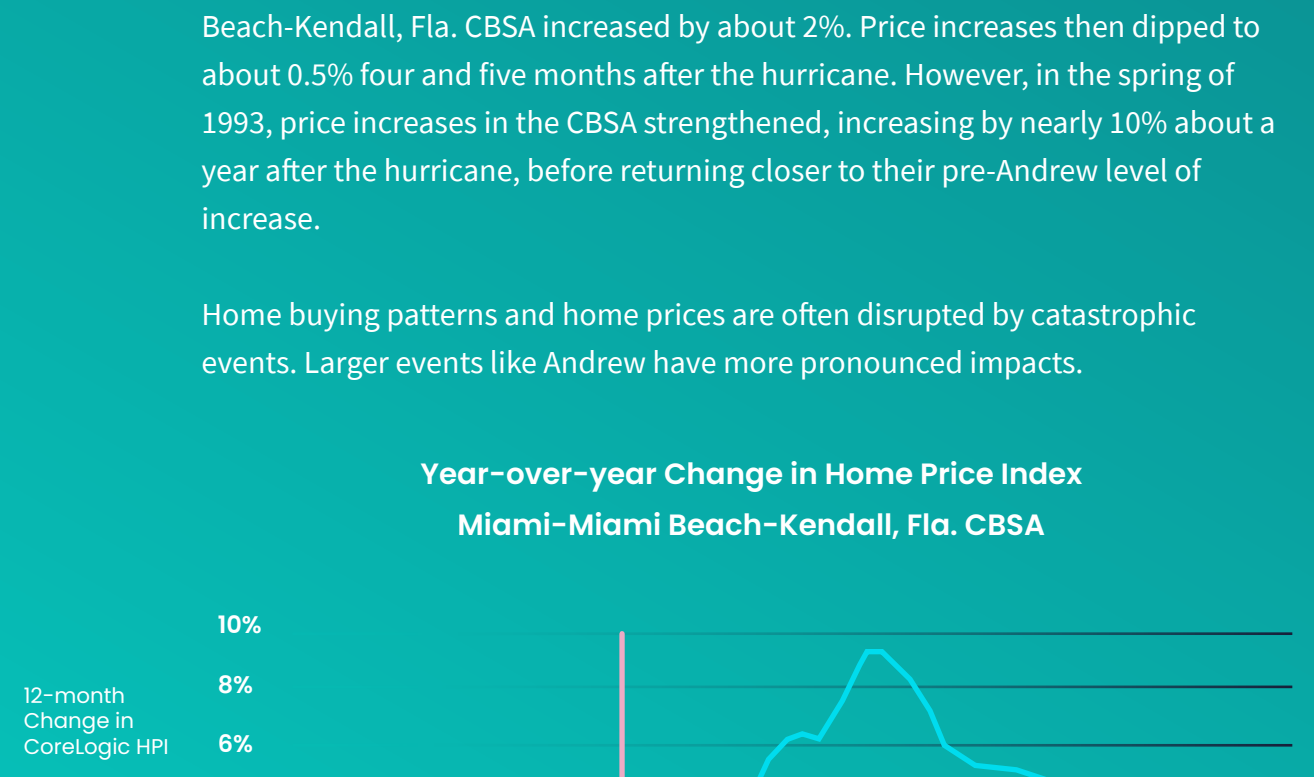
	Modeled Loss ($Billion)					
	Insurable			Insured		
Subperil	Residential	Commercial	Total	Residential	Commercial	Total
Wind	55.2	24.1	79.3	51.1	19.9	71.0
Storm Surge	8.9	1.9	10.7	2.4	0.3	2.7
Total	64.1	26.0	90.1	53.5	20.2	73.7

Table 2: Wind and storm surge insurable and insured losses by line of business (LOB) if Hurricane Andrew were to happen today. Source: CoreLogic 2022

Impact to real estate markets

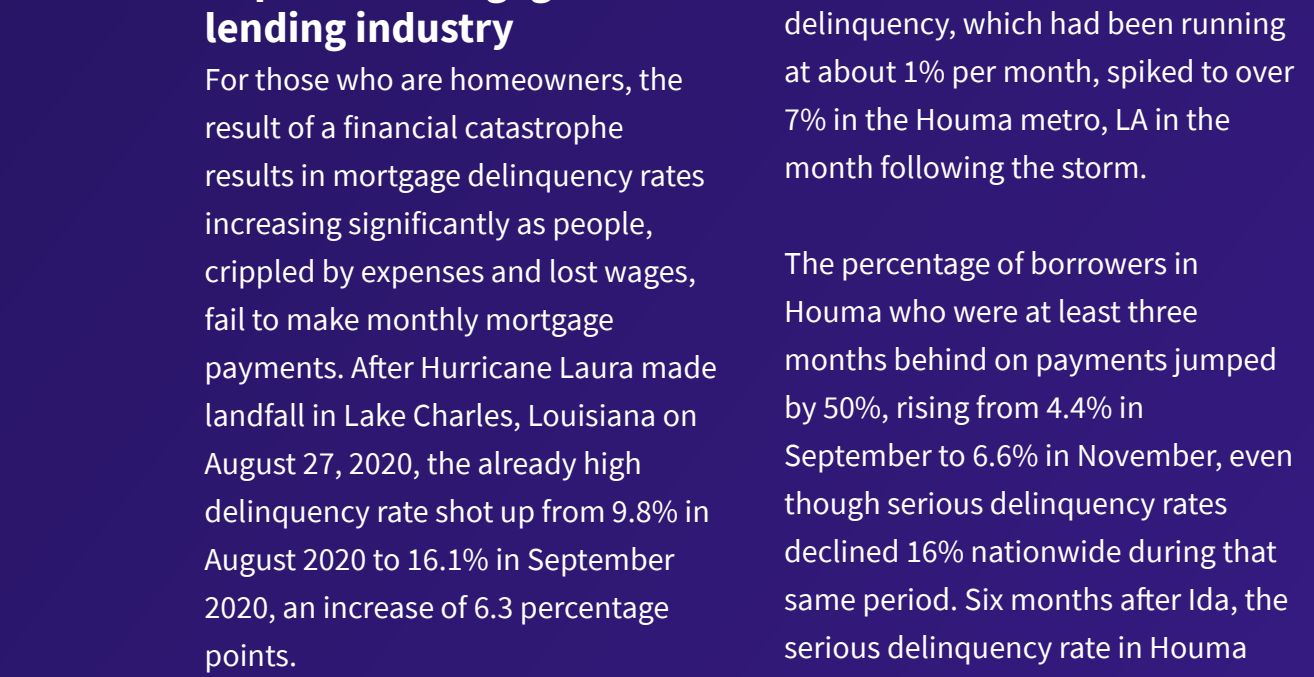
Real estate markets can be disrupted following a catastrophic event. Immediately following Hurricane Andrew, home sales in the Miami -Miami Beach-Kendall, Fla. CBSA slowed and then subsequently accelerated a few months after the event.

As shown in the chart below, home sales by month were similar from 1990 to 1992 just prior to the hurricane. However, just after Hurricane Andrew, there was a slowdown in home sales. Sales in August 1992 were 33% lower than a year earlier. Home sales began to pick up in November 1992 and stayed elevated for nearly two years.



Changes to home price trends are also sometimes observed after a hurricane. In the year before Hurricane Andrew, home prices in the Miami-Miami Beach-Kendall, Fla. CBSA increased by about 2%. Price increases then dipped to about 0.5% four and five months after the hurricane. However, in the spring of 1993, price increases in the CBSA strengthened, increasing by nearly 10% about a year after the hurricane, before returning closer to their pre-Andrew level of increase.

Home buying patterns and home prices are often disrupted by catastrophic events. Larger events like Andrew have more pronounced impacts.



Source: CoreLogic HPI

Impact to mortgage lending industry

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, Louisiana on August 27, 2020, 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.

The same phenomenon occurred after Hurricane Ida in 2021. Both home mortgage delinquencies and shelter costs rose because Hurricane Ida caused severe property damage and put significant strain on the community. In Ida's case, the transition rate from current-to-30-day delinquency, which had been running at about 1% per month, spiked to over 7% in the Houma metro, LA in the month following the storm.

The percentage of borrowers in Houma who were at least three months behind on payments jumped by 50%, rising from 4.4% in September to 6.6% in November, even though serious delinquency rates declined 16% nationwide during that same period. Six months after Ida, the serious delinquency rate in Houma remained above Louisiana's and was double what it had been in the months prior in early 2020.
If Hurricane Andrew were to occur again today, given the severity of the event and the now higher exposure, we would expect to see significant increases in mortgage delinquency.

Impact to other industries

Hurricanes can also pose significant threats to the tourism sector, an important segment of the Florida economy. In 2019, the leisure and hospitality industry accounted for nearly 6% of real state GDP, 14% of total employment and 15% of state sales tax collection[5]. After Hurricane Irma in 2017, Florida saw an immediate decline in airline passenger arrivals and hotel room demand. This included the loss of 1.8 million out-of-state visitors with an associated loss in spending of $1.5B over the following four months[6].

ODDS OF ANOTHER HURRICANE ANDREW

It is likely that if Hurricane Andrew were to repeat itself today, the impact would be catastrophic. But is it likely for South Florida to be hit by another Category 5 hurricane? Historically speaking, Florida and especially southeastern Florida, are at an elevated risk to major hurricanes.

The State of Florida has the highest annual probability of experiencing a landfalling hurricane relative to any other coastal US state, from Texas to Maine. From 1940 to 2020, there have been 120 landfalling hurricanes in Florida (Figure 2)[7].

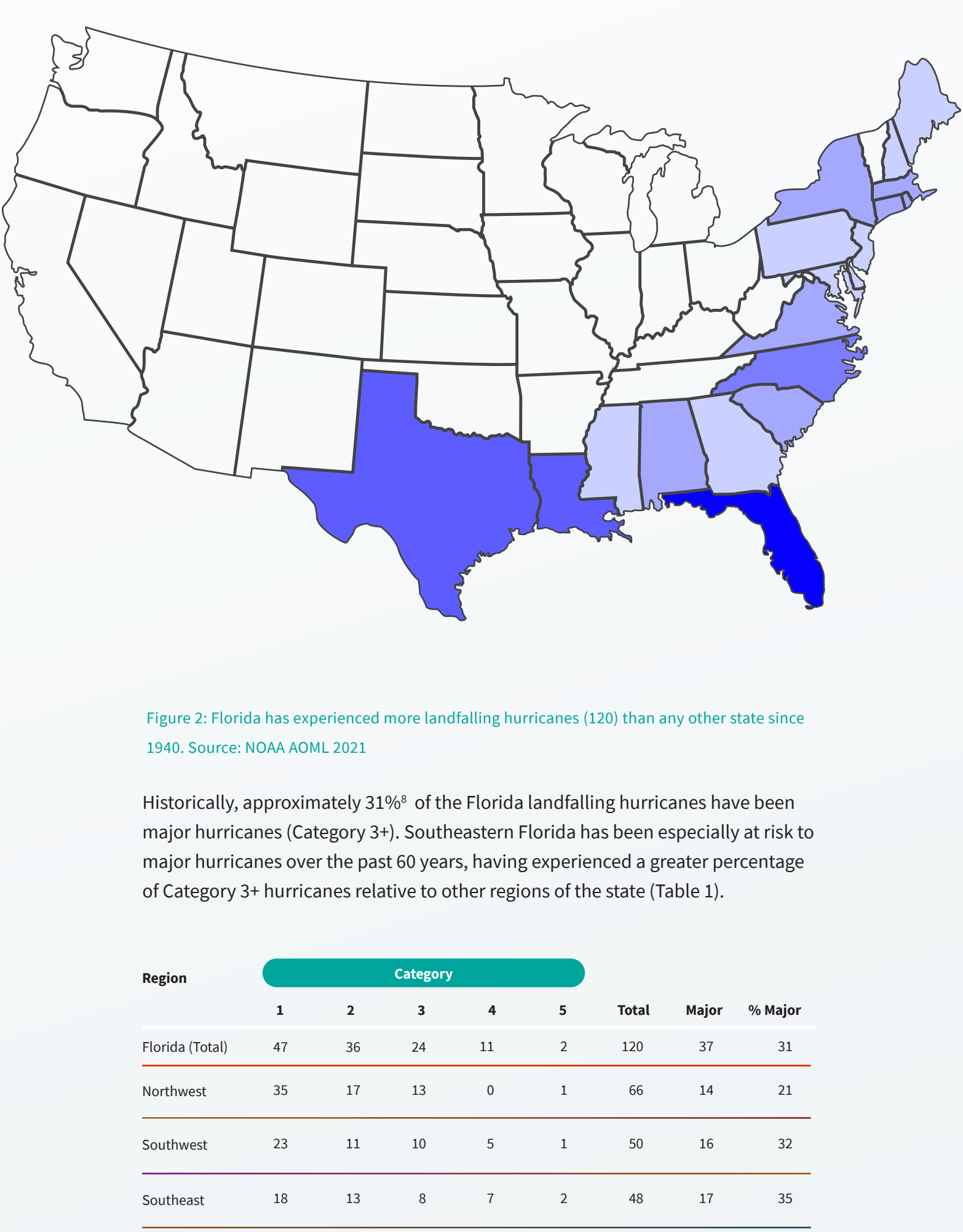


Figure 2: Florida has experienced more landfalling hurricanes (120) than any other state since 1940. Source: NOAA AOML 2021

Historically, approximately 31%[8] of the Florida landfalling hurricanes have been major hurricanes (Category 3+). Southeastern Florida has been especially at risk to major hurricanes over the past 60 years, having experienced a greater percentage of Category 3+ hurricanes relative to other regions of the state (Table 1).

Region	Category 1	2	3	4	5	Total	Major	% Major
Florida (Total)	47	36	24	11	2	120	37	31
Northwest	35	17	13	0	1	66	14	21
Southwest	23	11	10	5	1	50	16	32
Southeast	18	13	8	7	2	48	17	35
Northeast	20	6	1	0	0	27	1	4

Table 3: Count of U.S. landfalling hurricanes in Florida by state total and region from 1940-2020. Note that the state total will not necessarily equal the sum of sectional totals since storms may be counted for more than one region. Source: NOAA AOML 2021

Given the historical hurricane landfall trends, it would not be surprising for Miami-Dade to see another Andrew-like event again.

CONCLUSION

The risk management landscape has evolved tremendously since Hurricane Andrew in 1992. The infamous Category 5 landfalling hurricane taught industry professionals and general public alike that methods of estimating risk need constant updating to account for changing exposure landscapes and more accurate scientific understanding. But there are more questions to be asked. Given South Florida's high level of risk to hurricane activity, are homeowners prepared to withstand wind speeds surpassing 130 mph? If their homes are destroyed, do they have the financial backstops required to rebuild their homes and lives? Hopefully, the millions of homes that are at risk to a Hurricane Andrew-like event can withstand such a test, avoiding a complete catastrophe.

[1] Ed Rappaport, Preliminary Report Hurricane Andrew 16-28, August 1992 (National Hurricane Center, 1993). 1
[2] Landsea et. Al., A Reanalysis of Hurricane Andrew's Intensity, (American Meteorological Society, 2004). 1707
[3] Eric S. Blake, Christopher W. Landsea and Ethan J. Gibney, The Deadliest, Costliest, and Most Intense United States Tropical Cyclones From 1851 to 2010 (And Other Frequently Requested Hurricane Facts) (National Hurricane Center, 2011). 9
[4] Lynne McChristian, Hurricane Andrew and Insurance: The Enduring Impact of a Historic Storm (Insurance Information Institute, 2012). 3.
[5] Shernette Mcleod, Two Years to Remember: The Impact of the Pandemic on Florida's Tourism Industry (TD Economics, 2021). HYPERLINK "https://economics.td.com/us-years-to-remember%23:~:text=Tour-ism%20is%20Vital%20to%20Florida's,of%20state%20sales%20tax%20collection." https://economics.td.com/us-years-to-remember#:~:text=Tour-ism%20is%20Vital%20to%20Florida's,of%20state%20sales%20tax%20collection.
[6] Tourism Economics The Impact of Hurricane Irma on the Florida Tourism Economy https://www.visitflorida.org/media/46680/fl-hurricane-irma-impacts.pdf
[7] NOAA Atlantic Oceanographic and Meteorological Laboratory Hurricanes Frequently Asked Questions. (NOAA AOML 2021). https://www.aoml.noaa.gov/hrd-faq/#deadliest-hurricane-years
[8] NOAA Atlantic Oceanographic and Meteorological Laboratory Hurricanes Frequently Asked Questions. (NOAA AOML 2021). https://www.aoml.noaa.gov/hrd-faq/#deadliest-hurricane-years