

# Hurricane Andrew anniversary provides risk, prep lessons

By **Karen Clark** | May 10, 2022 at 12:00 AM



Ahead of National Hurricane Preparedness Week during the first week of May, the Insurance Institute for Business & Home Safety (IBHS) encouraged home and business owners to act early by preparing properties to be more resilient against storm damage. *(Shutterstock photo shows Mexico Beach, Fla., in October 2018 in the aftermath of Hurricane Michael.)*

[Hurricane Andrew](#) caused insured losses of \$15 billion in 1992, which would be over \$60 billion today with increases in the numbers and values of exposed properties.

But Andrew was not the proverbial “big one.” The storm hit well south of Miami in the relatively small town of Homestead. If a Category 5 hurricane like Andrew were to make a more direct on Miami today, the insured losses would be over \$150 billion.

Florida remains ground zero for hurricane risk, accounting for at least 30% of hurricane landfalls and 50% of the average annual hurricane losses in the U.S. Florida has more than 1,300 miles of coastline along the warm waters of the Caribbean Sea and the Gulf of Mexico. That state also has the highest potential for Category 4 and 5 hurricanes.

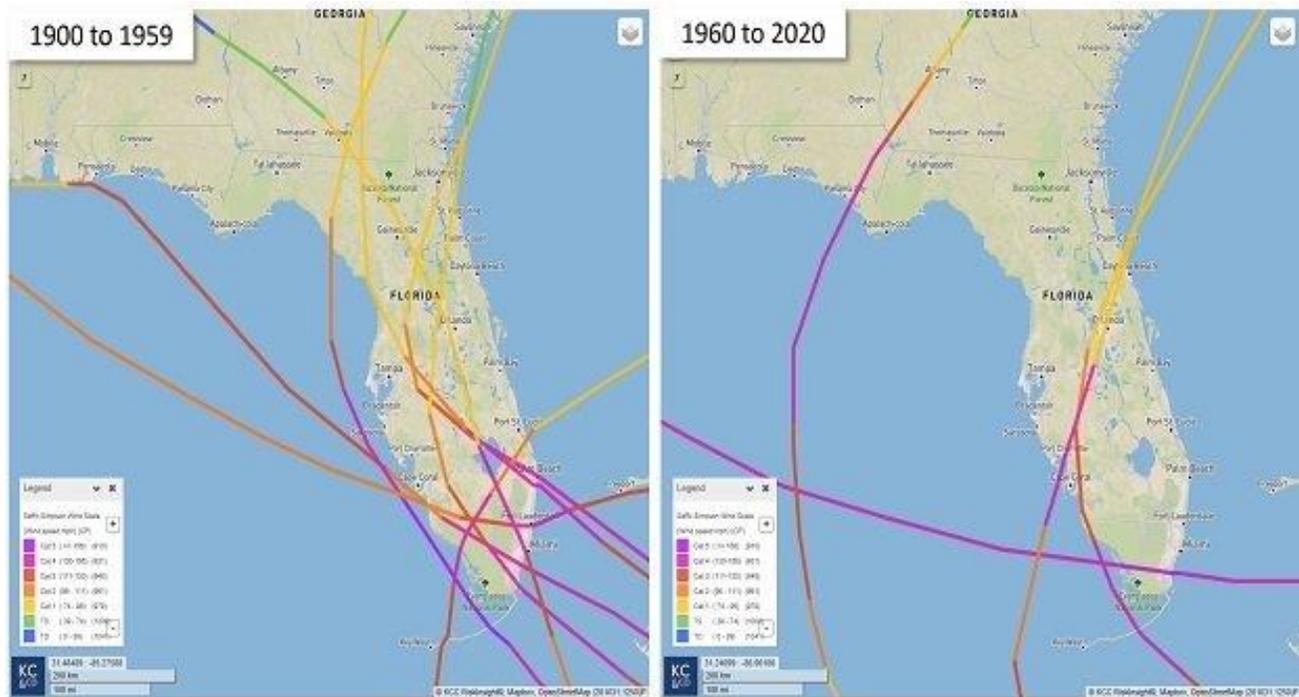


Figure 1. Tracks of Category 4 and 5 hurricanes making landfall in Florida before 1960 (left) and since 1960 (right).

The Miami and Palm Beach areas experienced six of severe events prior to 1960 but only one since then. (Graphic provided by Karen Clark & Co.)

### Increased hurricane risk

Each year, hurricane risk increases due to a number of factors. First, people continue to move to coastal areas. Florida's population grew by nearly 15% between 2010 and 2020, and COVID-19 accelerated the influx of people to the state.

Second, the sizes and replacement costs of residential and commercial properties increase each year. Single family homes are getting larger, commercial structures more complex, and building replacement costs generally increase about twice the general rate of inflation. Supply shortages caused by COVID over the past two years resulted in even larger spikes in construction costs — 26% for residential structures and 15% for commercial buildings since the beginning of 2020. Today, there is over \$13 trillion of building value along the Gulf and East coasts in the tier one coastal counties alone.

Finally, climate change is impacting hurricane severity and causing an increase in the proportion of major Category 3-5 hurricanes, according to the current scientific consensus as outlined in the most recent Intergovernmental Panel on Climate Change (IPCC) report. Studies conducted by KCC scientists and other climate experts have concluded that a 1-degree Celsius (C) temperature change results in a 2.5% increase in hurricane wind speeds. Since 1900, there has been a global temperature increase of 1.1° C resulting in a 2.75% increase in wind speeds.

While a 2.75% increase may not seem like a lot, losses increase exponentially with wind speeds. According to analyses conducted by KCC scientists, insured losses are 11% higher today than they would have been if global temperatures had not increased.

Perhaps more importantly, KCC analyses show the losses are not increasing uniformly across all return periods; rather climate change is altering the shape of the Exceedance Probability (EP) curve. The lower

return periods — the one in five, 10 and 20 year losses are rising faster than the one in 100-year and more extreme losses.

The \$150 billion loss from the Miami hurricane is about a 1 in 100-year loss amount. This size loss can only result from hurricanes striking a few other coastal areas, specifically Galveston-Houston and New York City. While we don't know when a \$150 billion loss will occur, (re)insurers should expect a \$10 billion hurricane loss every other year and a \$20 billion at least every five years, on average. A 20-year return period hurricane loss in the US is now \$40 billion.

These numbers will continue to grow each year. According to the Intergovernmental Panel on Climate Change (IPCC), under all emissions scenarios, temperatures are likely to continue increasing over the next few decades. Climate change and increasing property values in coastal areas will continue to accelerate the annual increases in hurricane risk and insured loss potential. Social inflation is also putting upward pressure on hurricane losses. The percentage of litigated claims is rising with each storm and the cost of a litigated claim is multiples of a non-litigated claim.

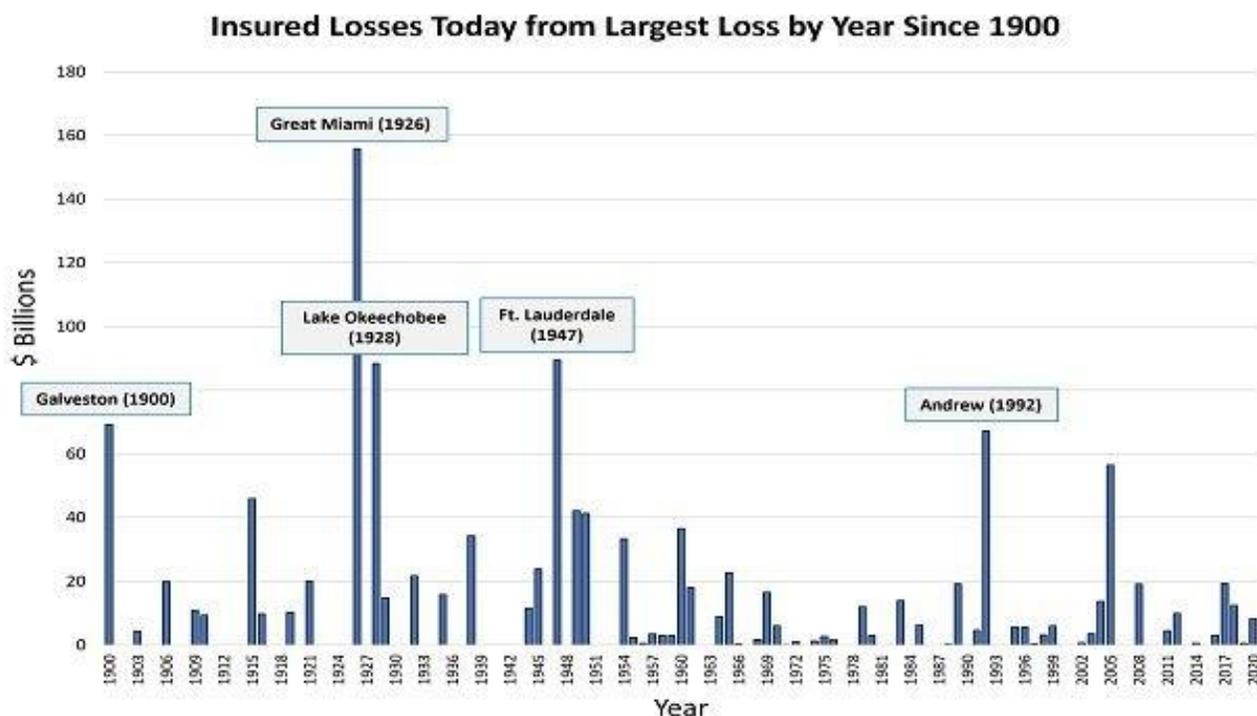


Figure 2: Graph shows for the largest loss per year, what the insured losses would be today. Source: KCC

There are four hurricanes since 1900 that would cause higher losses than Andrew if they occurred today; three of them impacted southeast Florida. (Graphic provided by Karen Clark & Co.)

### Preparedness, mitigation, models and insurance

[A lot has changed over the three decades since Andrew.](#) Insurers and property owners are better prepared for hurricanes now than they were in 1992. Real time hurricane forecasts are improving, and the industry has sponsored extensive research into loss mitigation, primarily through the Institute for Business and Home Safety (IBHS).

Coastal states have generally improved their building codes and code enforcement practices. Florida has done the most with measures that include implementing higher design-wind speeds, increasing the wind-borne debris (WBDR) region, and instituting product approval systems to make sure wind and impact

resistance requirements are met. Other states have increased wind-design loads, updated roof-design loads, and adopted statewide mandatory building code enforcement. KCC scientists have conducted detailed analyses of billions of dollars of high-resolution insurer claims data that confirm newer buildings perform significantly better during major weather events than older structures.

The growth in hurricane loss potential, however, continues to outpace reductions from better building codes. This is primarily due to ever-increasing coastal property values.

Insurers are in business to protect property owners from risk, so increasing risk means increasing market opportunities. (Re)insurers can capitalize on these opportunities as long as the risk is quantified and priced adequately.

### **Since Hurricane Andrew**

Catastrophe models in recent years have become the global standard tools for quantifying, pricing, transferring and managing catastrophe risk. What was and remains unique about the models is their fundamental structure and architecture. Catastrophe models provide the infrastructure for starting with an event, determining the location-level intensities caused by that event, estimating the damage to exposed properties, and ultimately calculating the financial loss. For every type of peril — namely hurricanes, wildfires and earthquakes — and for every country and region, models have these same primary components.

Catastrophe models are built around large stochastic event sets representing the probabilities of events of different sizes and severities by location. This produces the most important output of a catastrophe model — the EP curve — which provides estimates of the probabilities of losses of different sizes on a particular portfolio of properties.

Hurricane models have advanced since Andrew, and there are more models available today. But loss estimates can differ significantly between the various vendor models. This is indicative of the uncertainty inherent to estimating losses for extreme events, and some models provide more credible loss estimates than others. For example, there are now seven Florida approved hurricane models, and the loss estimates can differ by a factor of two between the low and the high.

### **Market pressures**

Competitive pressures and market forces tend to drive prices down to the lowest model numbers (versus the most credible numbers), which likely leads to prices that do not fully reflect the risk. These market forces include reinsurance brokers producing the lowest numbers on behalf of their clients, not enough differentiation by rating agencies with respect to the financial stability of insurers, and regulatory processes that limit rate increases to consumers.

After Andrew, the largest P&C insurers dramatically reduced their market shares of property business in hurricane prone areas, especially Florida. Despite better building codes, loss mitigation activities, and advances in catastrophe models, major insurers have not come back to these areas in a meaningful way. The gap has been filled by dozens of smaller companies, specialty Florida insurers, and expanding involuntary markets.

The U.S. property insurance market has not been tested with the “big one.” The fact that relatively modest-sized losses in recent years have led to several insurer insolvencies indicates the one in 100-year loss today may cause even more disruption than Hurricane Andrew did in 1992.

Even a one in 50-year loss, which is now over \$100 billion, could cause difficulties for the current market. Combine that with increasing frequencies of \$20- and \$40-billion losses, and it's clear there's still more to do to improve the resiliency of coastal insurance markets.

Much has changed over the last 30 years, and significant progress has been made in the areas of hurricane preparedness and loss mitigation. But in one sense, the industry is where it was before Hurricane Andrew: The market generally continues to underestimate the risk and insured loss potential.

Resiliency requires adequate rates that keep pace with climate-conditioned hurricane risk and social inflation along with premiums reflecting rising construction costs and the full replacement values of insured properties. Insurance premiums sufficient to cover all costs will enable property insurers and their policyholders to be better protected against the frequency and severity of future hurricane losses.

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