Hard Market Cycle Arrives

Inflation, Natural Disasters, and More Straining Property Insurance Markets

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American Property Casualty Insurance Association[SM]
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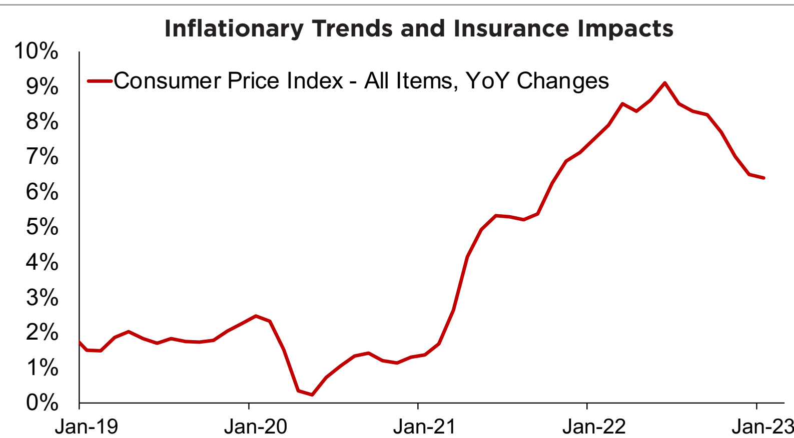
EXECUTIVE SUMMARY

Rapid increases in inflation since the start of the COVID-19 pandemic have contributed to significant property and casualty (P&C) insurance losses and deteriorating combined ratios. Insurance claims inflation remains higher than the underlying consumer price index, far outpacing increases in premiums, while natural disaster losses continue to climb, resulting in the hardest market cycle in a generation.

This report examines some of the top inflation trends and financial impacts resulting in significant pressure for property insurers, reinsurers, and consumers.

KEY TRENDS AND FINANCIAL IMPACTS



Source: Bureau of Labor Statistics.

Inflation

- The U.S. inflation rate accelerated to a 41-year high of 8.0 percent in 2022, reaching a peak in June of 9.0 percent. The producer price index hit 6.2 percent in 2022, coming on the heels of a 10.0 percent increase in 2021, the two largest calendar-year increases since data were first calculated in 2010.[1] However, insurance claims inflation has risen even faster, contributing to significant underwriting losses.

Financial Results

- Preliminary estimates show the U.S. property casualty insurance industry combined ratio climbed above 100 percent for the first time since 2017, reaching 102.5 percent[2] to 104.0 percent,[3] according to S&P Global and A.M Best, respectively.
- A.M. Best noted personal lines incurred an estimated underwriting loss of $34.9 billion in 2022, nearly tripling the prior-year level and driving an industry five-year high underwriting loss.[4]
- The U.S. property casualty insurance industry's policyholder surplus fell 9.4 percent in 2022,[5] according to A.M. Best, and is likely to be the largest drop since early 2009,[6] according to S&P.
- Insurers' average return on net worth over the past 10 years has been *less than half* the *Fortune Magazine* all-industry average,[7] with the gap significantly widening over the long term.

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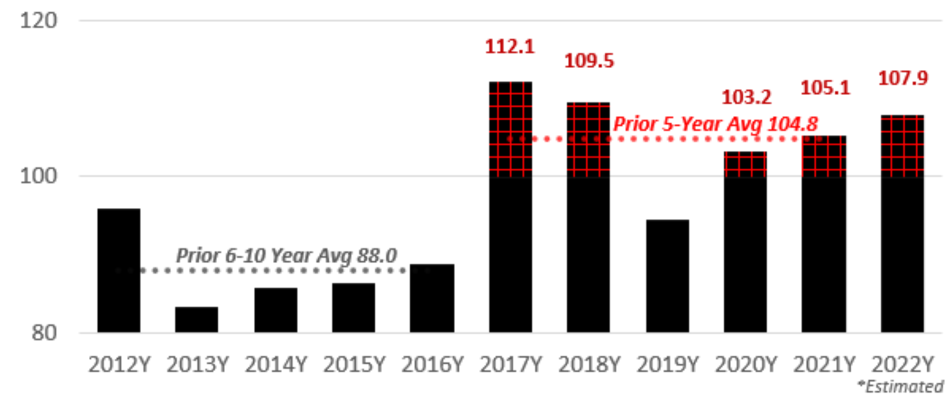
1 https://www.bls.gov/news.release/ppi.nr0.htm .
2 S&P Global Market Intelligence, (Mar 8, 2023) "US P&C industry statutory combined ratio tops 100% for 1st year since 2017"; excludes state funds and residual market entities.
3 A.M. BEST, (Mar 7, 2023) BEST'S Market Segment Report "Review & Preview".
4 *Ibid.*
5 *Ibid.*
6 S&P Global Market Intelligence, (Mar 8, 2023) "US P&C industry statutory combined ratio tops 100% for 1st year since 2017".
7 NAIC Report on Profitability by Line by State in 2021, January 2023 edition; reflects the average of annual returns from 2012-2021 for the p-c industry and for the Fortune Magazine all-industry average.

Cost Inputs Remain Elevated for Property Lines

- The cost of the materials and labor needed to reconstruct homes and businesses remains elevated. Since the start of the COVID-19 pandemic, the price of single-family residential home construction materials rose by 33.9 percent[8] (January 2020 through December 2022), contributing to significantly higher underwriting losses.
- 2022 combined ratio[9] for U.S. homeowners line is estimated to reach 107.9 percent,[10] which will exert upward pressure on insurance rates, and may result in reduced capacity and stricter underwriting in numerous states as insurers work to replenish policyholder surplus.
- Adding to the industry's financial woes, significant losses since 2017 have pushed the cost of capital to levels not seen since the 2001-2006 period if not before[11] – a cost that is rippling through catastrophe-exposed markets.

U.S. Homeowners Combined Ratio



Sources: APCIA using S&P Global Market Intelligence.
*A.M. Best (Review & Preview, March 7, 2023).

Natural Catastrophe Losses

- 2022 was the eighth year in a row the U.S. suffered at least 10 catastrophes causing over a billion dollars in losses.[12]
- Natural disaster losses from 2020-2022 in the U.S. exceeded $275 billion[13] in 2022 dollars–the highest ever three-year total for U.S. insurers.
- The U.S. incurred 75 percent of global insured losses in 2022, according to Aon, led by Hurricane Ian–now the second costliest insured loss ever on record globally–followed by drought and severe storms.
- Population, housing, and business growth in hazard-prone areas are exacerbating the effects of climate change, leading to more frequent and severe catastrophe losses and underscoring the need for property owners to harden their homes and businesses to reduce potential loss and damage.

ECONOMIC LOSS (USD billions)	INSURED LOSS (USD billions)	EVENT
$165.0	**$99.0**	**TOTAL**
$95.5	$52.5	Hurricane Ian
$16.0	$8.0	U.S. Drought
$3.4	$2.7	Severe Convective Storm
$2.8	$2.3	Severe Convective Storm
$2.7	$2.2	Upper Midwest Derecho

Source: Aon 2023 Weather, Climate and Catastrophe Insight.

8 U.S. Bureau of Labor Statistics from Federal Reserve Bank of St. Louis (FRED).
9 Combined ratio is usually considered as a measure of the profitability of an insurance company. When the combined ratio exceeded 100 percent, insurers paid out more money to cover losses and expenses than they were able to collect in premiums.
10 A.M. BEST, (Mar 7, 2023) BEST'S Market Segment Report "Review & Preview".
11 **https://www.businessinsurance.com/article/20230103/NEWS06/912354630/Reinsurers-hike-rates,-exclude-Russia-and-Ukraine-Brokers**.
12 NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023), **https://www.ncei.noaa.gov/access/billions/time-series**.
13 Aon 2023 Weather, Climate and Catastrophe Insight.

HARD MARKET CYCLE ARRIVES
Inflation, Natural Disasters, and More Straining Property Insurance Markets

OVERVIEW

U.S PROPERTY & CASUALTY INSURERS FACING HARDEST MARKET IN A GENERATION

The U.S. property casualty (P&C) insurance industry is facing significant pressure from rising economic inflation, social inflation (e.g., legal system abuse), supply chain constraints, increasing catastrophic weather, and more. The combined effects are resulting in the hardest market[14] cycle in a generation.

The U.S. inflation rate accelerated to a 41-year high of 8.0 percent in 2022, while the producer price index hit 9.5 percent, coming on the heels of a 7.0 percent increase in 2021, the two largest calendar-year increases since data were first calculated in 2011.[15] However, inflation for property insurance claims has risen even faster, contributing to significant underwriting losses.

Quarterly Inflation Trends, Year-over-Year Changes

Source: Verisk '360Value Quarterly Reconstruction Cost Analysis', Bureau of Labor Statistics.

Rising mortgage interest rates tempered demand for new homes in 2022, resulting in a slowdown in new construction. However, since the start of the pandemic, the overall cost of residential single-family home construction materials remains up 33.9 percent while trade services are up 27.0 percent (January 2020 through December 2022).[16] The Associated General Contractors (AGC) of America specifically cited rising materials costs as one of its top concerns for 2023.[17]

Additional pressures weighing heavily on U.S. property insurers in multiple states are varying combinations of higher loss costs driven heavily by legal system abuse, claims fraud, government interference in the form of both new laws that expand policy coverage and overall exposure for insurers, and regulatory constraints that simultaneously limit the ability of insurers to manage growing exposure and costs. These unique challenges are examined in greater detail in a recent white paper, entitled: **It's Not Just the Weather: The man-made crises roiling property insurance markets**.

The impact of these issues is often amplified in insurance claims following large catastrophes, which were significant in 2022. 75 percent of global insured losses in 2022 were incurred in the U.S., driving up the total natural disaster insured losses in the U.S. from 2020-2022 to more than $275 billion-the highest ever three-year total for U.S. insurers.

14 A "hard market" generally refers to an insurance market cycle characterized by rising premiums, tighter coverage terms, and reduced capacity for insurance.

15 U.S. Bureau of Labor Statistics from Federal Reserve Bank of St. Louis (FRED). PPI figure is for final demand.

16 U.S. Bureau of Labor Statistics from Federal Reserve Bank of St. Louis (FRED).

17 Associated General Contractors of America: **https://www.agc.org/news/2023/01/18/overall-costs-construction-materials-decline-steeply-december-contractors-remain-wary-costs-will-go.**

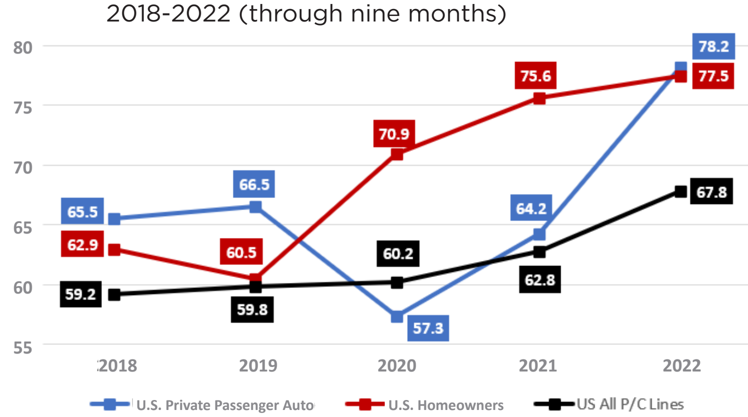
Additional pressures include rising property theft impacting commercial property lines, such as organized retail crime and cargo theft.[18] Finally, insurers are facing significant upward pressure on reinsurance rates across all property lines of business, as reinsurers are similarly forced to respond to rising global natural disaster costs. Reinsurance broker Guy Carpenter estimates that property-catastrophe reinsurance prices rose 30.1 percent in 2023, following a 14.8 percent increase in 2022.[19]

Financial Results

This unusual combination of challenges has created a perfect storm resulting in a significant deterioration in personal lines loss results in 2022, according to Fitch and S&P Global Market Intelligence.[20]

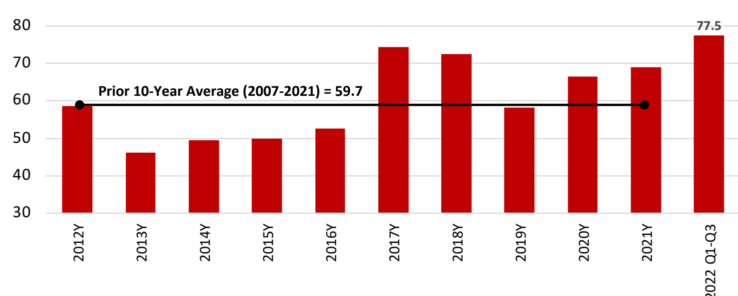
Data from S&P indicates the direct incurred loss ratio for homeowners multiperil rose to 77.5 percent for the first three quarters of 2022, versus 76.0 percent for the same period in 2021.

Direct Loss Ratios for Select Personal Lines
2018-2022 (through nine months)

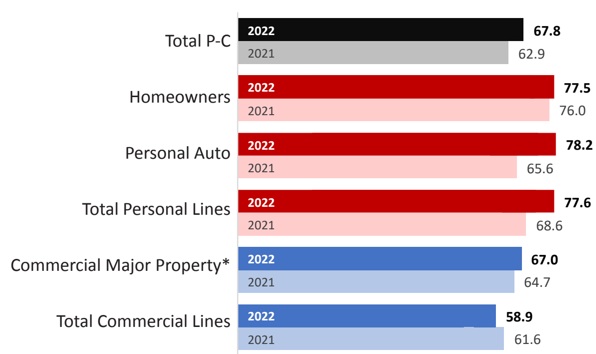


Source: 2018-2021 data: Insurance Journal, based on data from AM Best January 25, 2022 Report "US Property/Casualty Top Line Premiums Up, Loss Ratio Deteriorates Through 3Q 2021".
2022 data: APCIA, via S&P Global Market Intelligence.

Homeowners Loss Ratio (%)
P&C Industry Countrywide



Direct Incurred Loss Ratios Q1-Q3 for Key P&C Lines (%)



Source: APCIA via S&P Global Market Intelligence and Fitch.

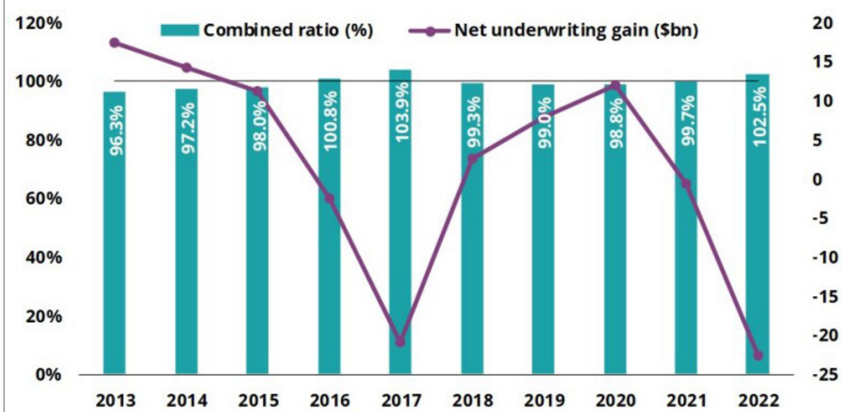
Commercial Major Property: Fire, Allied, Commercial Multi-Peril (including liability), Farmowners, and Inland Marine

18 National Retail Federation, 2022 Retail Security Report: **https://nrf.com/research/national-retail-security-survey-2022**.
19 Guy Carpenter, via Artemis.bm **https://www.artemis.bm/us-property-cat-rate-on-line-index**.
20 Fitch Ratings, S&P Global Market Intelligence **https://www.fitchratings.com/research/insurance/higher-prices-yields-portend-stabilized-2023-p-c-insurance-results-21-12-2022**.

In addition, for total personal lines (i.e., the combination of homeowners and personal auto lines), the loss ratio climbed to 77.6 percent through the third quarter, with year-end estimates from S&P suggesting the personal lines loss ratio for the full year will reach 76.4 percent–20 points higher than commercial lines and by far the largest spread between the two business segments in the past 25 years.[21]

Preliminary estimates from S&P Global and A.M. Best show the combined ratio for the U.S. property casualty insurance industry climbed above 100 percent for the first time since 2007, reaching 102.5 percent[22] to 104.0 percent,[23] respectively. A combined ratio below 100 percent generally indicates underwriting profitability.

U.S. P&C industry combined ratio and net underwriting gain since 2013



Source: S&P Capital IQ, Inside P&C. https://www.insidepandc.com/article/2bdmq136x244rfovbb75s/industry-wide/2022-naic-statutory-data-is-out-trends-reflect-the-widespread-impact-of-inflation.

Additionally, A.M. Best estimates a 9.4 percent decline in U.S. property casualty policyholder surplus.[24] This would mark the fifth decline in the past 20 years, though S&P suggested the decline may likely be the largest on a relative basis since the throes of the financial crisis in 2008 when P&C industry surplus plunged by 12.7 percent.[25]

For property lines, combined ratio results have been very elevated following multiple years of extreme catastrophe losses, resulting in multiple years exceeding 100 percent. According to Insurance Information Institute (Triple-I) / Milliman P/C Underwriting projections: 2021-2023, the projected combined ratio for the homeowners line may reach 115 in 2022, while commercial multi-peril lines is expected to come in just under 100. In recent, preliminary estimates, A.M. Best projected homeowners and commercial multi-peril lines 2022 combined ratios of 107.9 percent and 98.4[26] percent, respectively.

According to Triple-I and Milliman, rising construction materials prices, wage pressure, and elevated catastrophe losses will continue to pressure property insurer underwriting performance in 2023.[27]

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21 S&P Global Market Intelligence, (Mar 8, 2023) "US P&C industry statutory combined ratio tops 100% for 1st year since 2017".
22 *Ibid*; excludes state funds and residual market entities.
23 A.M. BEST, (Mar 7, 2023) BEST'S Market Segment Report "Review & Preview".
24 *Ibid*.
25 S&P Global Market Intelligence, (Mar 8, 2023) "US P&C industry statutory combined ratio tops 100% for 1st year since 2017".
26 A.M. BEST, (Mar 7, 2023) BEST'S Market Segment Report "Review & Preview".
27 Underwriting Projection: A Forward View (Nov 2022), Triple-I and Milliman https://www.iii.org/insuranceindustryblog/jif-2022-combined-ratio-takes-center-stage/.

Net Combined Ratio and Change in NWP

Sources: APCIA via S&P Global Market Intelligence.
*2022 Estimates and 2023 Projections from Triple-I and Milliman.

While the industry remains positioned to meet its expected obligations, the unusual combination of multi-year losses and future uncertainty is weighing heavily on property lines, exerting upward pressure on rates and implicating potential implementation of stricter underwriting discipline across all personal and commercial property lines.

CONSUMER ACTION KEY TO BENDING DOWN LOSS CURVE

To help ease pressure on consumers following increased natural disasters and costs, the insurance industry is continuing to encourage property owners in high-risk areas to take steps now to mitigate potential losses by hardening homes and businesses. Property owners can help bend the loss curve down, which may help ease some of the pressure on costs.

Insurers recommend property owners consider the following strategies which additionally may help reduce premium costs.

- Mitigation – Many insurers offer discounts for mitigation measures that help reduce the likelihood of a loss or extent of damage. While available discounts may vary by company, the following are some of the most common.
  - *Building materials or other upgrades* can be completed to help make the exterior of a home or business more disaster resilient.

    Note:
    - Examples are discussed later in this paper under the 'Key Solutions Prove Beneficial' section, which highlights building codes and mitigation in action.
  - *Safety devices* that leverage smart technology can be installed to help predict and prevent damage from occurring within a home or business.

    Examples:
    - *Security systems*: includes window and door sensors, smart locks, or video doorbells to fend against burglary.
    - *Water sensors*: for leak detection and pressure monitoring that alerts a property owner if a pipe has burst, as well as gas and water shutoff sensors.
    - *Smart thermostats and light controls*: provide property owners with the ability to connect, monitor and further control interior conditions.
    - *Smoke detectors*: to warn of a fire or carbon monoxide.

- Catastrophe deductibles – Insurers typically provide consumers with options to increase or decrease their share of risk for catastrophic exposure, to best fit their needs and budget. To reduce insurance premiums, consumers can increase their share of the risk (i.e., out-of-pocket cost following a large disaster) by selecting a higher deductible (or catastrophe deductible, if available).

For homes or businesses that do sustain losses, property owners should anticipate higher than normal costs and timeframes needed to rebuild. In light of the continuing inflationary pressures, insurers are strongly encouraging policyholders to review and consider increasing their coverage, as needed.

Key options that may be available:

- Replacement cost coverage – Pays an amount necessary, up to policy limits, to repair or rebuild the home (or business) with construction materials of like kind and quality and replace personal belongings without deducting depreciation.

- Automatic inflation factor – Designed to automatically adjust the coverage amount at each renewal time to help keep up with rising costs, however, during periods of extreme inflation it remains important to review coverage limits.

- Home additions or renovations – Ensure the policy has been updated to reflect any new features, such as increased square footage or an upgraded kitchen.

Consider additional optional features:

- Ordinance and Law coverage – Designed to increase coverage limits available to help comply with any new building codes or green energy ordinances, such as solar panel installations.

- Extended replacement cost coverage – Designed to further increase coverage limits available to rebuild the home when demand and costs for labor and material skyrocket after a natural disaster, known as "demand surge".

- Additional living expense (ALE) coverage – Optional higher limits may be available to help cover hotel and food costs if a longer timeframe is needed to rebuild the home.

Recent natural catastrophes, inflation and other issues described in this report are resulting in significantly higher losses, putting upward pressure on the cost of property insurance for consumers. However, as the property insurance industry works to stabilize these impacts, these additional policy features and tools may provide insureds significant value and added financial protection should a loss occur.

COSTS REMAIN ELEVATED

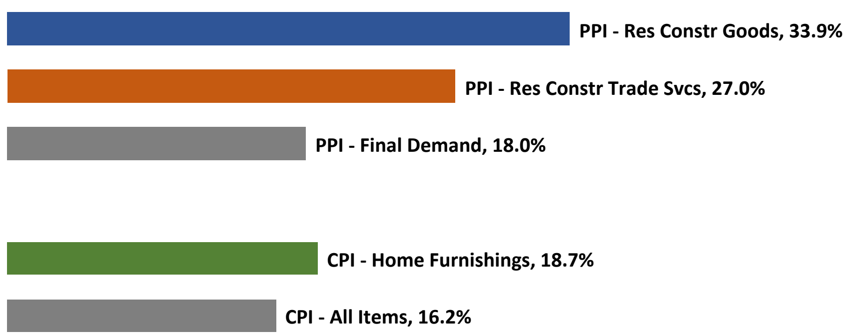
Supply chain constraints from the COVID-19 pandemic have plagued property insurance markets for several years. Manufacturing of key construction materials experienced major reductions in early 2020 just as consumer demand shifted from services to goods. Demand for materials, such as lumber, surged while supplies were drawn down due to strong demand for new construction, remodels, and reconstruction following a record number of natural disasters, while shipping and other transport disruptions added further pressure from delays.

SUPPLY & DEMAND CONTINUE TO POSE INFLATION CHALLENGES

In 2022, U.S. ports experienced some relief following widespread port congestion caused by COVID-19-related demand surges. All three of the biggest ports in the U.S., located in California and New Jersey, saw fewer imports in 2022 than in 2021. However, these ports were still busier than they were before the pandemic despite activity being down year-over-year.[28]

The significant imbalance in supply and demand resulted in a spike in materials and labor costs, far outpacing broader inflation trends. While cost inputs for some materials have stabilized, reconstruction costs remain elevated, with cost indicators for residential reconstruction goods and services nearly twice the current rate of inflation since the start of the pandemic, while home furnishings are slightly higher than the consumer price index.

Cost Indicators, Home Insurance
Price Index Changes, Jan 2020 through Dec 2022



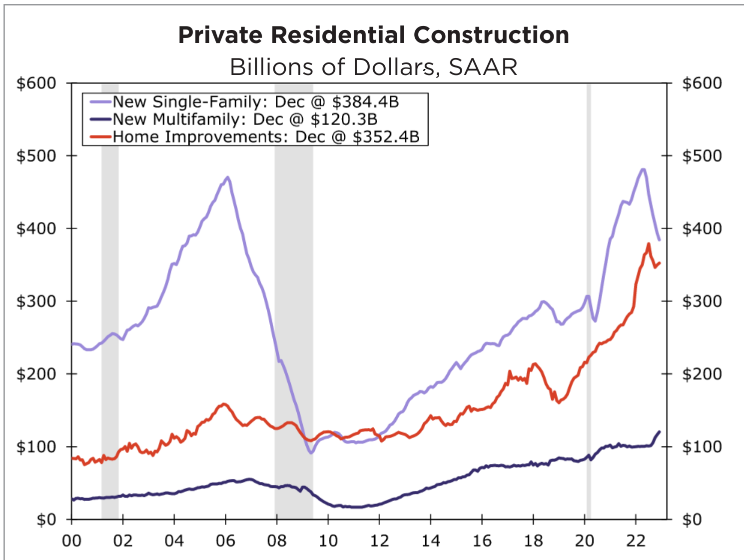
Sources U.S. Bureau of Labor Statistics | fred.stlouisfed.org

Producer Price Index by Commodity: Inputs to Industries: Net Inputs to Single Family Residential Construction, Goods and Services. Data not seasonally adjusted for Goods (ex. food/energy) and Trade Services (i.e., labor). Data as of Feb 16, 2023.

BUILDING TRENDS

After nearly two years of torrid growth, new single-family home construction activity began to slow in 2022—a result of the Federal Reserve's (Fed's) aggressive rate actions designed to rein-in inflation. The rate on a 30-year mortgage began 2022 at just over 3 percent, peaked at 7.1 percent in November and ended the year at 6.4 percent.

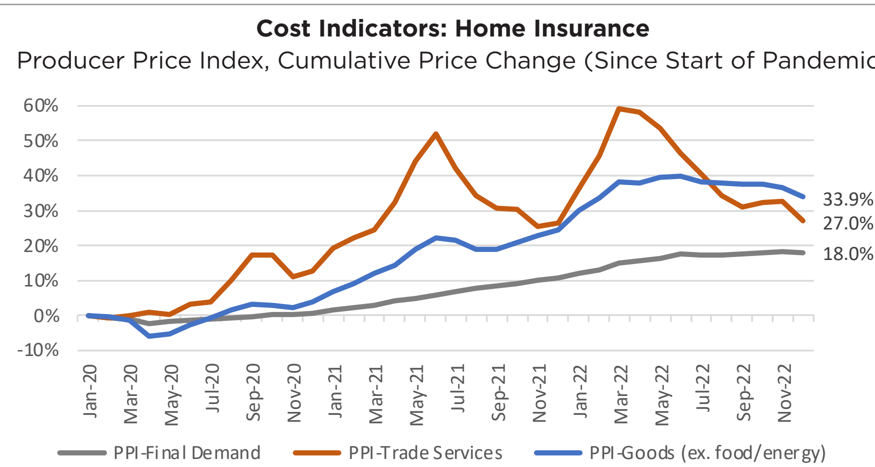
28 S&P Global Market Intelligence (Feb 17, 2023) "Pandemic-era US port clogs start to unwind in 2022 EXCLUSIVE".



Source: U.S., Department of Commerce | Wells Fargo Economics (data ending Dec. 2022).

Yet despite rising real estate financing costs, overall private residential construction activity last year remained resilient. The total spend on construction for multifamily dwellings hit a new record high in December 2022 while spending on home improvements also remained strong.

Resilient construction activity implies that demand for construction materials and skilled contractors to build new homes and complete home remodeling projects remains strong. However, one increasingly important contributor to the demand for construction materials and labor is the rising toll of natural disasters. Insured catastrophe losses totaled an estimated $275 billion from 2020 through 2022, a record for any three-year period, leading to acute shortages of both labor and materials in impacted areas while also putting additional pressure on the price of construction materials across the country. Materials and labor supply are likely to remain strained as the long-term threat from natural disasters continues to escalate due to a combination of climate change and rapid economic development in vulnerable areas, adding pressure on overall costs and homeowners insurance premiums.

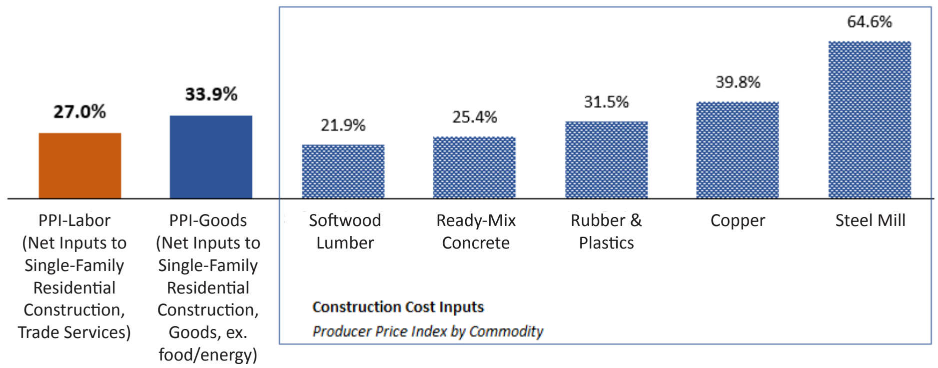


Source: U.S. Bureau of Labor Statistics | fred.stlouisfed.org.
Producer Price Index by Commodity: Inputs to Industries: Net Inputs to Single Family Residential Construction, Services and Goods. Data not seasonally adjusted for Goods (ex. food/energy) and Trade Services (i.e., labor). Data as of Feb. 16, 2023.

According to the Producer Price Index (PPI), since the start of the pandemic, commodities experiencing the largest cost increases for single family residential construction are steel mill products which have climbed nearly 65 percent, copper which is up almost 40 percent, and rubber and plastic products which are up 31.5 percent.

Cost Indicators: Home Insurance

Cumulative Price Index Changes, January 2020 to December 2022



Source: U.S. Bureau of Labor Statistics | fred.stlouisfed.org.
Producer Price Index by Commodity: Inputs to Industries: Net Inputs to Single Family Residential Construction, Goods and Services. Data not seasonally adjusted for Goods (ex. food/energy) and Trade Services (i.e., labor). Data as of Feb. 16, 2023.

Lumber has been among the most affected materials, in terms of cost and longer lead times to secure materials.[29] The National Association of Home Builders (NAHB) had previously reported the increase in cost from lumber added $36,000 to the cost of building the average single-family home after lumber peaked in the summer of 2021 at over $1600 per 1,000 board feet–an increase of over 400 percent.[30] While lumber costs moderated some in the latter half of 2021, they surged again in 2022, more than tripling from pre-pandemic levels before once again receding, though prices remain far above their January 2020 level.

Daily lumber (LBS) closing price

(deviation from 2019 volume weighted average)

Source: nasdaq.com.

PPI data for single family residential construction noted ready-mix concrete also finished up 25.4 percent from pre-pandemic levels, while other PPI data showed the price for gypsum, also known as drywall, hit an all-time record high in 2022 (based on data going back to 1993) and finished the year up 46 percent from pre-pandemic levels.[31]

Looking ahead, Fed rate hikes were initially expected to peak in mid-2023 and potentially pivot toward rate cuts late this year or in early 2024, leading to some projections that new single family home construction might stabilize and growth resume. However, the latest remarks from Federal Reserve Chairman Jerome Powell in March dampen that outlook, suggesting "the ultimate level of interest rates is likely to be higher than previously anticipated."[32] While new residential construction and remodels activity are projected to remain lower in 2023, a report from Moody's Investors Service in February 2023 noted the building materials sector is projected to "outperform" over the next 12 to 18 months in the United States. Moody's stated robust public infrastructure spending and continued momentum in commercial spending are expected to offset the tough domestic housing market.[33]

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29 https://www.usatoday.com/story/money/markets/2021/06/23/home-building-lumber-prices-renovations-delayed-amid-covid/7768522002/.
30 https://www.cnbc.com/2021/05/18/home-construction-sees-biggest-drop-since-pandemic-hit-heres-why.html.
31 U.S. Bureau of Labor Statistics from Federal Reserve Bank of St. Louis (FRED).
32 https://www.cnbc.com/2023/03/07/fed-chair-powell-says-interest-rates-are-likely-to-be-higher-than-previously-anticipated.html.
33 https://www.builderonline.com/data-analysis/infrastructure-spending-to-offset-tough-housing-market-for-building-materials-sector_o.

OTHER TRENDS

In addition to elevated construction costs, A.M. Best highlighted pressure from the "general rise in claims demands, settlements, and judgements (i.e., social inflation)", which are trends that impact future claims and also require a continual re-evaluation of existing claims reserves.[34]

> *... robberies, burglaries, and larcenies increased between January and June of 2022 relative to the same period in 2021.*

Property crimes are also up, according to the report Pandemic, Social Unrest, and Crime in U.S. Cities (Mid-Year 2022 Update) by the Council on Criminal Justice. After falling during the first two years of the pandemic, robberies, burglaries, and larcenies increased between January and June of 2022 relative to the same period in 2021. Opportunities for retail theft and commercial robberies have increased as shops have reopened following the COVID-19 pandemic, with reports suggesting inflation and law enforcement challenges in some cities may potentially be playing a role.[35] However, retail crime goes well beyond shoplifting.

Organized retail crime (ORC)—which is large-scale theft of retail merchandise with the intent to resell for financial gain—is also on the rise. According to the National Retail Federation (NRF), external theft (which includes ORC) reached $94.5 billion in 2021 — up 4.1 percent from $90.8 billion in 2020. The NRF's latest National Retail Security Survey found that retailers saw an average 26.5 percent increase in ORC incidents in over the previous year.[36] The survey noted the top items stolen by organized retail crime included pain and allergy medication, blades and razors, fragrances, cosmetics, alcohol, gift cards, power tools, printer cartridges, clothing, shoes, handbags and jewelry, as these items generally can be resold and easily concealed.[37]

Similarly, with copper prices still high, thieves are targeting copper in every form and selling it to scrap yards for cash. For example, catalytic converter thefts have surged nationwide impacting auto loss costs, with public data company BeenVerified noting a 540 percent increase in thefts in 2022 versus 2020 . In property lines, the most popular items being targeted for their copper are outdoor air conditioning units. Buildings left unoccupied at night, as well as those located in rural areas, are considered easy targets.

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34 A.M. BEST, (Mar 7, 2023) BEST'S Market Segment Report "Review & Preview".
35 **https://www.propertycasualty360.com/2022/12/20/economic-factors-will-dictate-risk-trends-for-2023/**.
36 **https://nrf.com/advocacy/policy-issues/organized-retail-crime**.
37 **https://www.axios.com/2023/02/20/shoplifting-store-closings-price-increases-locked-cases**.
38 **https://www.usatoday.com/story/money/cars/2023/02/21/catalytic-converter-crime-protect-your-car/11312397002/**.
39 **https://www.propertycasualty360.com/2022/12/20/economic-factors-will-dictate-risk-trends-for-2023/**.

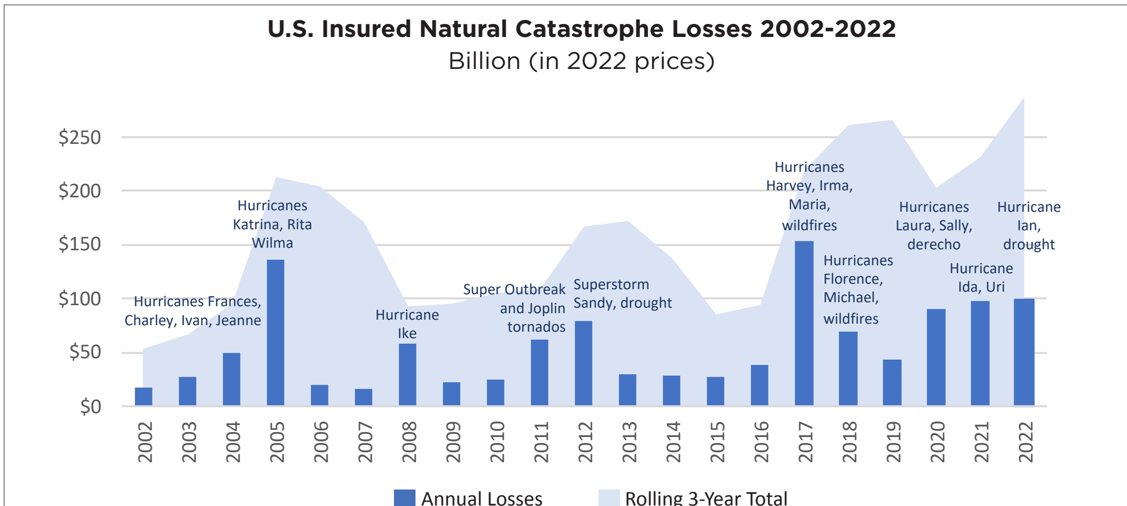
2022 NATURAL DISASTERS IN THE U.S.

NATURAL CATASTROPHE LOSS TOTALS

2022 resulted in a third consecutive active and costly year for insurers for natural disasters. Aon, one of the largest global insurance brokers, reported global natural catastrophes reached $313 billion in economic losses, while global insured losses reached $132 billion–well above the short-, medium- and long-term averages, and surpassing the $100 billion threshold for the third time in a row.[40]

In the U.S., economic losses reached $165 billion, 65 percent above the average since 2000 (adjusted to 2022 dollars). Insured losses reached $99 billion, once again recording the highest proportion of global insured losses (75 percent), and the third consecutive year that the U.S. share topped 70 percent.[41]

The combined insured losses of 2020 through 2022 reached $287 billion (adjusted to 2022 dollars), making this the costliest consecutive three-year period on record for U.S. insurers.



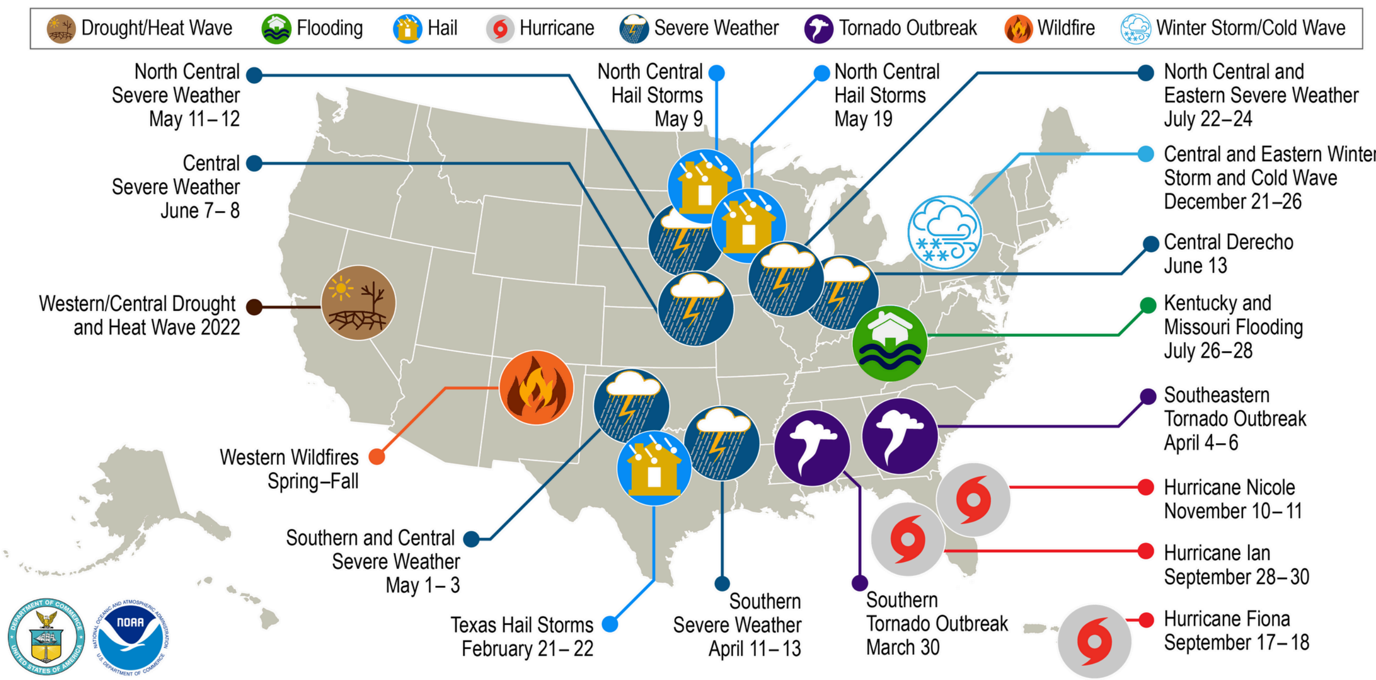
Data Source: APCIA, via Aon.
Includes 50 U.S. States & Territories (Puerto Rico, U.S. Virgin Islands and other U.S. territories).

BILLION-DOLLAR WEATHER EVENTS

According to the National Oceanic and Atmospheric Administration (NOAA)[42] between hurricanes, wildfires, and other severe storms, 2022 became the eighth consecutive year in which the U.S. experienced 10 or more separate billion-dollar weather and climate-related disasters. In 2022, there were 18 weather/climate disaster events with losses exceeding $1 billion each to affect the U.S., including 11 severe storm events, three tropical cyclones, and one wildfire event, drought event, flooding event, and winter storm event. Overall, these disasters resulted in the deaths of 474 people, displaced hundreds of thousands of residents, and had significant economic impacts on the affected communities.[43]

40 Aon 2023 Weather, Climate and Catastrophe Insight.
41 *Ibid.*
42 **https://www.ncei.noaa.gov/news/national-climate-202212**.
43 **https://www.scientificamerican.com/article/disasters-displaced-more-than-3-million-americans-in-2022/**.

U.S. 2022 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the ***18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.***

Source: **https://www.ncdc.noaa.gov/billions/**.

NOAA further indicated 2022 was particularly notable for landing in the top three for both frequency of events and overall disaster costs in the U.S. The 1980–2022 annual average is 7.9 events (CPI-adjusted); the annual average for the most recent five years (2018–2022) is 17.8 events (CPI-adjusted).[44]

1980-2022 United States Billion-Dollar Weather and Climate Disasters
(CPI-Adjusted)

EVENT COST	
2017	$373.2
2005	$352.5
2022	$165.0
2021	$155.3
2012	$150.3
2020	$114.3
Average	*$57.6*

EVENT COUNT	
2020	22
2021	20
2022	18
2017	18
2011	18
2018	15
Average	*7.9*

Source: National Oceanic and Atmospheric Administration (NOAA).

44 NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023), **https://www.ncei.noaa.gov/access/billions/** .

HURRICANE IAN RANKS AS COSTLIEST GLOBAL DISASTER IN 2022

According to Aon, Hurricane Ian was the costliest global loss event in 2022 resulting in $95 billion in economic losses and $50-55 billion in insured losses, while the U.S. drought was the second costliest insured loss event.[45]

Top 10—2022 Global Climate & Weather Events – ECONOMIC LOSSES

DATES	EVENT	LOCATION	ECONOMIC LOSS (USD billion)	INSURED LOSS (USD billion)	DEATHS
09/27 - 10/01	**Hurricane Ian**	**United States, Cuba**	**95.5**	**52.5**	**157**
Annual	European Drought	Europe	22.0	3.0	n/a
Annual	**U.S. Drought**	**United States**	**16.0**	**8.0**	**n/a**
06/14 - 10/30	Pakistan Seasonal Floods	Pakistan	15.0	0.1	1739
06/01 - 09/30	China Seasonal Floods	China	15.0	0.4	195
03/16	Fukushima Earthquake	Japan	9.1	2.9	4
02/23 - 03/31	QLD & NSW Floods	Australia	8.0	4.0	22
Annual	China Drought	China	7.6	0.2	n/a
02/18 - 02/19	Windstorm Eunice	Europe	4.5	3.4	17
05/17 - 10/31	India Seasonal Floods	India	4.2	0.1	2135
		All other events	*115.6*	*57.4*	*27,100*
		TOTAL	**313.0**	**132.0**	**31,300**

Source: Aon 2023 Weather, Climate and Catastrophe Insight.

Munich Re further noted, Hurricane Ian was responsible for more than one third of overall losses and for roughly half of insured losses worldwide.[46]

Top 10—2022 Global Climate & Weather Events – INSURED LOSSES

DATES	EVENT	LOCATION	ECONOMIC LOSS (USD billion)	INSURED LOSS (USD billion)	DEATHS
09/27 - 10/01	**Hurricane Ian**	**United States, Cuba**	**95.5**	**52.5**	**157**
Annual	**U.S. Drought**	**United States**	**16.0**	**8.0**	**n/a**
02/23 - 03/31	QLD & NSW Floods	Australia	8.0	4.0	22
02/18 - 02/19	Windstorm Eunice	Europe	4.5	3.4	17
Annual	European Drought	Europe	22.0	3.0	n/a
03/16	Fukushima Earthquake	Japan	9.1	2.9	4
06/11 - 06/17	**Severe Convective Storm**	**United States**	**3.4**	**2.7**	**3**
04/10 - 04/14	**Severe Convective Storm**	**United States**	**2.8**	**2.3**	**1**
05/11 - 05/12	**Upper Midwest Derecho**	**United States**	**2.7**	**2.2**	**5**
05/19 - 05/22	**Severe Convective Storm**	**United States**	**2.6**	**2.1**	**2**
		All other events	*146.1*	*49.2*	*31,100*
		TOTAL	**313.0**	**132.0**	**31,300**

Source: Aon 2023 Weather, Climate and Catastrophe Insight.

45 Aon 2023 Weather, Climate and Catastrophe Insight.
46 https://www.munichre.com/en/company/media-relations/media-information-and-corporate-news/media-information/2023/natural-disaster-figures-2022.html.

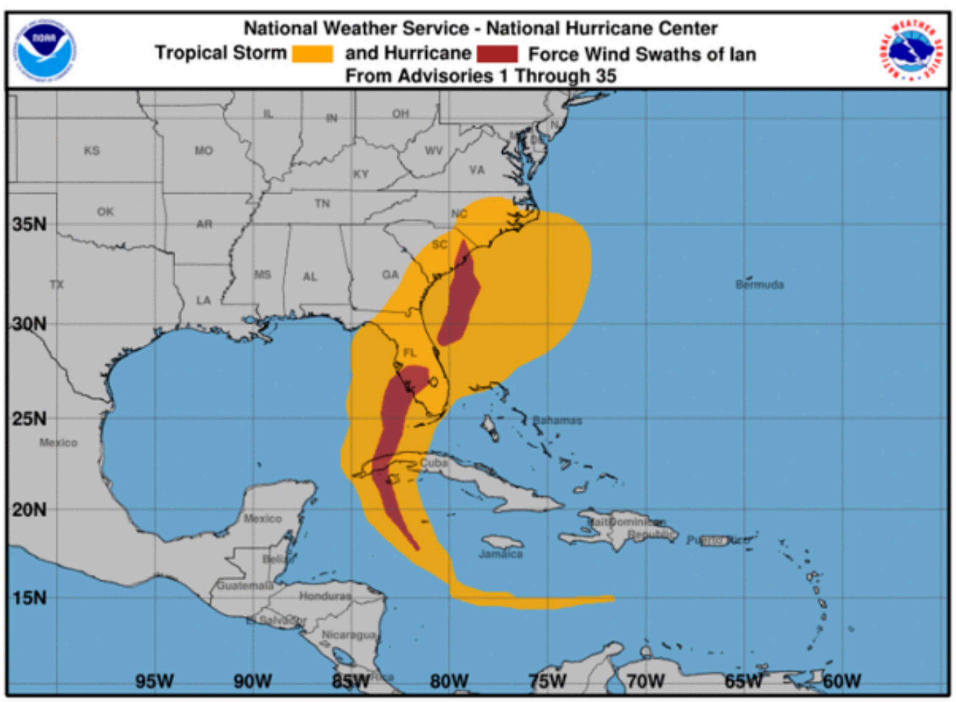
According to Aon, Hurricane Ian became the second costliest insured loss event ever on record globally, second only to Hurricane Katrina in 2005 and surpassing the Great Tohoku Earthquake and Tsunami of 2011. Munich Re further noted, Hurricane Ian was responsible for more than one third of overall losses and for roughly half of insured losses worldwide.[47]

Top 10 Costliest Global Insured Loss Events – 1900-2022

DATES	EVENT	LOCATION	INSURED LOSS (Nominal USD billion)	INSURED LOSS (2021 USD billion)
Aug 2005	**Hurricane Katrina**	**United States**	**65**	**96**
Sep 2022	**Hurricane Ian**	**United States**	**53**	**53**
Mar 11, 2011	Tohoku EQ/Tsunami	Japan	35	47
Sep 2017	**Hurricane Irma**	**United States, Caribbean**	**33**	**40**
Aug-Sep 2021	**Hurricane Ida**	**United States, Caribbean**	**36**	**39**
Oct 2012	**Hurricane Sandy**	**United States, Caribbean, Canada**	**30**	**39**
Aug 2017	**Hurricane Harvey**	**United States**	**30**	**36**
Sep 2017	Hurricane Maria	Puerto Rico, Caribbean	30	36
Aug 1992	**Hurricane Andrew**	**United States, Bahamas**	**16**	**34**
Jan 17, 1994	**Northridge EQ**	**United States**	**15**	**31**

Source: Aon 2023 Weather, Climate and Catastrophe Insight.

Hurricane Ian rapidly intensified to a strong Category 4 storm by the time it struck Cayo Costa on the Florida Gulf Coast, on September 28. The storm tied as the fifth strongest hurricane to make landfall in the U.S.,[48] and pushed a wall of water 12 to 18 feet high into parts of the coast, before dropping as much as 15 inches of rain in 12 hours in some places.[49] After charging across the Florida peninsula, Ian entered the Atlantic Ocean, then made a second landfall as a Category 1 storm in Georgetown, South Carolina, on September 30.



Source: National Hurricane Center graphic.

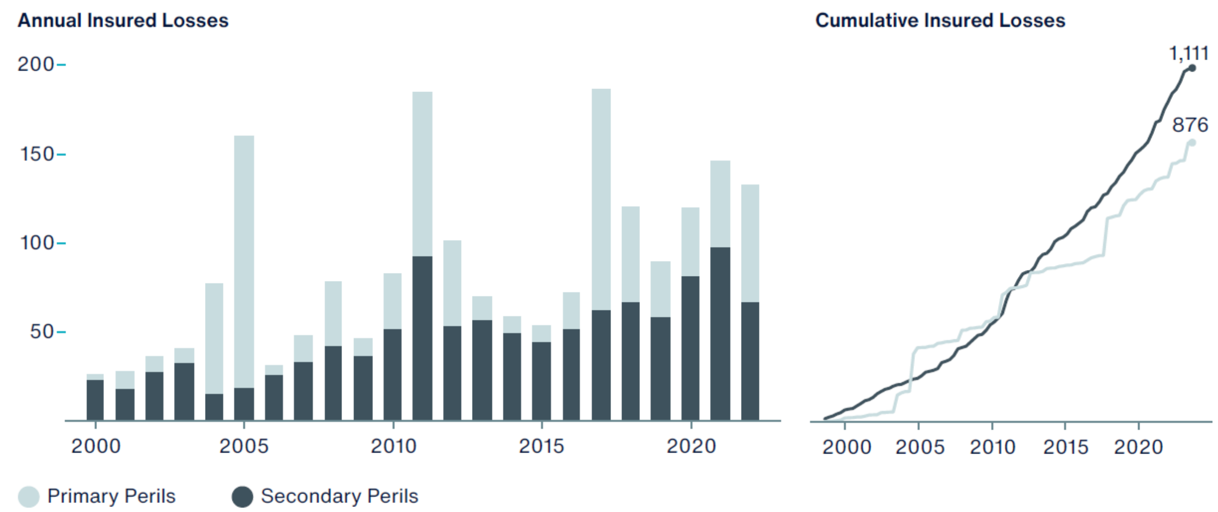
48 Aon 2023 Weather, Climate and Catastrophe Insight.
49 https://www.nola.com/news/hurricane/10-most-expensive-hurricanes-in-us-history/article_1d65a750-91f0-11ed-abdf-c3d270be6a06.html.

SECONDARY PERIL LOSSES REMAIN HIGH

Insurers continue to be concerned with the increasing volume of so-called "secondary peril" events, which are generally smaller to mid-sized events or secondary effects that follow a primary peril. These include severe storms,[50] wildfires, flooding, drought, and snow and ice storms. In 2022, severe storm events and the ongoing U.S. drought resulted in insured losses of $29 billion and $8 billion, respectively.[51]

Such secondary peril events are becoming more impactful and generating an increasingly larger volume of insured losses, affecting the bottom lines of personal and commercial lines property underwriters. For example, data from Aon shows since 2000 secondary perils have resulted in $1.11 trillion in insured losses globally (55.9 percent),[52] while Moody's noted secondary perils' share of total insured losses globally has further climbed to over 60 percent on average over the last three years (2020-2022).[53]

Insured Losses from Primary/Secondary Perils (2022 $ bn)



Source: Catastrophe Insight, Aon.

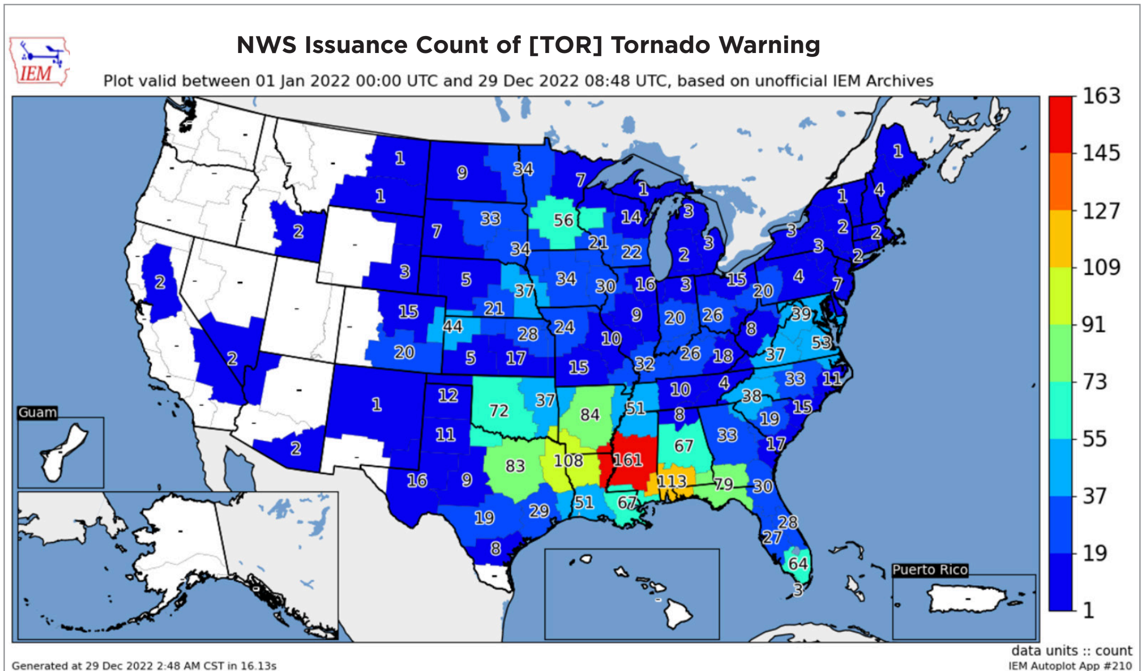
Exacerbating these challenges in the U.S. are continued demographic shifts and population growth in coastal or other catastrophe-prone areas which are further contributing to the increased magnitude of economic and insured losses.[54]

Severe Storms

A total of 12 severe convective storms in the U.S. in 2022 generated nearly $29 billion in insured losses, becoming the third-costliest year for the peril behind 2020 ($38bn USD) and 2011 ($33bn USD), and topping $20 billion in insured losses for the fourth consecutive year. At least five of these severe convective storms occurred in April, May, and June, with the costliest storm outbreak on June 11 – 17, resulting in $2.7 billion in insured losses.[55] Aon previously noted aggregate loss totals at this level may require a shift, with the "new normal" increasing from an expected minimum $10 billion annual industry loss to instead at least $15 to $20 billion.[56]

50 Severe storms refers to any convective storm that generally includes lightning and thunder, and may produce large hail, strong winds, and/or tornadoes.
51 Aon 2023 Weather, Climate and Catastrophe Insight.
52 *Ibid.*
53 **https://www.bnnbloomberg.ca/reinsurers-retreat-from-us-disaster-hotspots-on-climate-risks-1.1868699**.
54 **https://www.insurancejournal.com/news/national/2022/01/24/650571.htm**.
55 Aon 2023 Weather, Climate and Catastrophe Insight.
56 Aon 2021 Weather, Climate and Catastrophe Insight.

The 2022 season kicked off with an active spring tornado season, and ultimately resulted in the National Weather Service issuing more than 2,300 tornado warnings in 2022. Of note, most were in the South, with greater than normal activity seen to the east of tornado alley–a concerning trend as these are more densely populated regions.



Source: IOWA State University/FOX Weather.

A March storm system was the largest tornado outbreak of 2022, producing 90 tornados from the Plains to the Northeast. The storms caused thousands of power outages and an estimated $1.3 billion in damage.[57] The strongest tornado in 2022 was an EF-4 on the Enhanced Fujita Scale that hit outside of Savannah in April with peak winds of about 185 mph. It formed from a multi-day severe weather outlook that began in Texas and tracked through the Eastern Seaboard, producing at least 89 tornadoes. At its peak, the tornado was three quarters of a mile across and touched down on the ground over 14 miles.

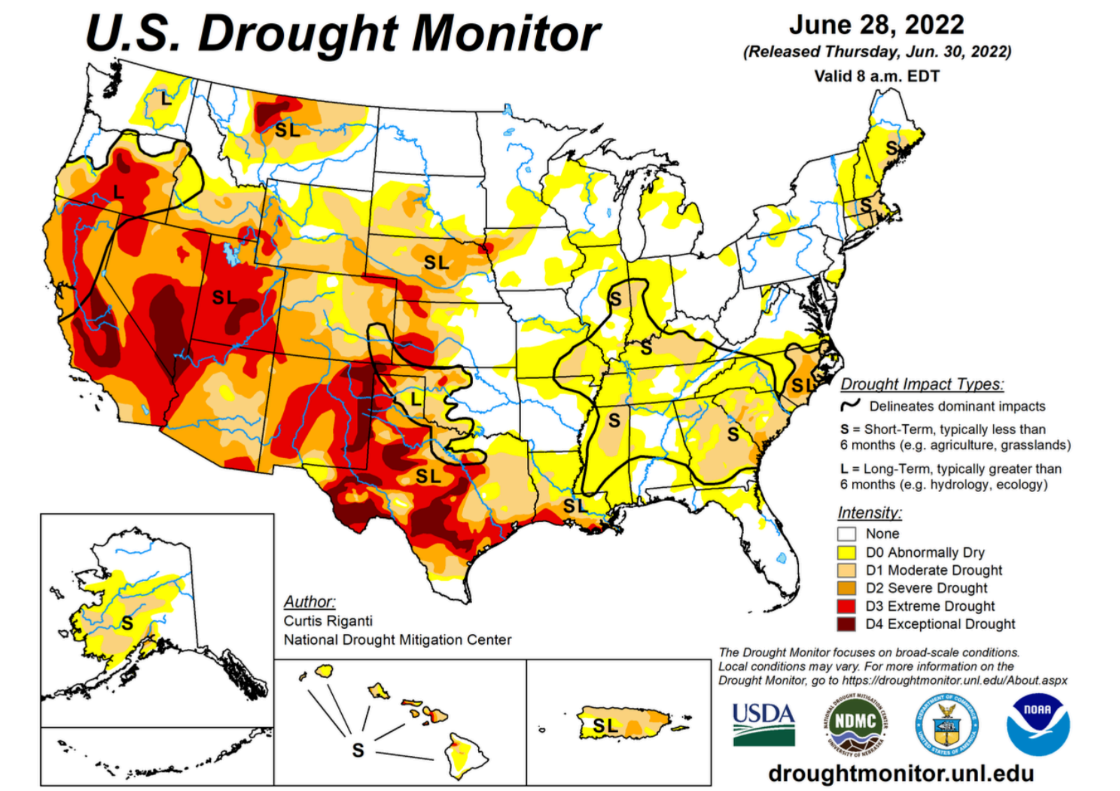
Drought

Prolonged and severe drought conditions continue to persist across much of the U.S. The portion of the continental U.S. experiencing "abnormally dry" conditions under the U.S. Drought Monitor in November 2022 reached its highest level since accurate recordkeeping began in 2000, which resulted in crop insurance payouts due to drought reaching their highest level since the historic losses experienced in 2012.[58]

A 2022 study in the journal Nature Climate Change reported that the southwestern U.S. is currently experiencing its worst megadrought in over 1,200 years and attributed 42 percent of the last two decades' hot and dry conditions to global climate change.[59] Significant high temperatures have further amplified the current megadrought resulting in the aridification, or drying up, of the region including, most notably, the Colorado River Basin, which has seen its natural flows diminished by nearly 20 percent since 2000.[60]

57 **https://www.foxweather.com/weather-news/2022-tornado-recap-country**.
58 Aon 2023 Weather, Climate and Catastrophe Insight.
59 **https://www.theguardian.com/environment/2022/sep/12/us-west-megadrought-climate-disaster**.
60 **https://www.discovermagazine.com/environment/how-the-u-s-megadrought-will-affect-2022-and-beyond**.

Megadrought Persists in Western U.S.



Source: **https://www.ncei.noaa.gov/news/us-drought-monitor-update-june-28-2022**.

Wildfire

Intensifying drought conditions coupled with climate change continue to result in higher risk of wildfire across the western U.S. As a result, 2022 was an active wildfire year with the National Interagency Fire Center (NIFC) reporting 66,255 wildfires, the highest number in 10 years, and more than 7.5 million acres burned. The number of fires and acres burnt were above the 10-year averages of 59,733 fires and 7.3 million acres, while the acres burnt per fire were below average.

One of the largest events in 2022 was the Hermits Peak / Calf Canyon Fire in New Mexico, which burned 342,000 acres and became the state's largest fire. It began as a prescribed fire[61] in the Santa Fe National Forest, but erratic winds in the late afternoon caused multiple spot fires that spread beyond the project's intended boundary to become the Hermits Peak wildfire. The Calf Canyon Fire was caused by a pile burn holdover from the winter that remained dormant, and later merged with the Hermits Peak Fire.

California experienced a relatively mild wildfire season–a much-needed reprieve–due to a combination of favorable precipitation and wind conditions. In 2022, wildfires in California burned 362,000 acres compared to 4.3 million acres in 2020 and 2.5 million acres in 2021. Community preparedness may have also played a role in reducing wildfire destruction in California, as CalFire conducted 290,000 defensible space inspections during the year.[62] The state's largest wildfire event in 2022 was the Mosquito Fire, which burned 77,000 acres, compared to the Dixie Fire in 2021 which burned 963,000 acres and stands as California's largest single and non-complex wildfire ever recorded.[36]

61 According to the U.S. Forest Service, "prescribed fires", also known as prescribed burns, refer to the controlled application of fire by a team of fire experts under specified weather conditions to restore health to ecosystems that depend on fire.

62 **https://disasterphilanthropy.org/disasters/2022-north-american-wildfires/**.

63 Aon 2023 Weather, Climate and Catastrophe Insight.

MARKET IMPACTS

COST OF CAPITAL SKYROCKETS

In response to recent, significant economic inflation, social inflation (e.g., legal system abuse), supply chain constraints, and increasing catastrophic weather, insurers are facing very hard market conditions.

Coastal/wind markets have been difficult following three active hurricane seasons. However, there has also been a continued hardening across secondary perils, which are increasingly contributing to global losses. In response, the cost of capital to spread risk has skyrocketed following significant natural catastrophe losses in recent years. Insurers are facing higher reinsurance prices for less coverage, increased retention,[64] and tighter terms. Reinsurers have also reported that less retrocession[65] capacity is available, reducing their ability to further spread risk among global reinsurance providers.

After similarly suffering significant losses in recent years, broader capital markets have also been pulling back, impacting catastrophe bonds and insurance-linked securities. With higher interest rates, investors have alternative investment options that may provide higher investment returns, while the strong dollar has also made global reinsurance much more expensive for U.S. insurers, further constricting domestic capacity.

"The last time we saw this level of capital dislocation was during the 2008-2009 global financial crisis. At the same time, the sector is experiencing its most acute, cyclical price increases since the 2001-2006 period if not before," said David Flandro, head of analytics at Howden, in the firm's latest report.[66] Howden separately noted, for property catastrophe reinsurance, which has been the hardest hit line this year, the global rate-on-line index rose an average of 37 percent, the largest year-over-year increase since 1992.[67]

However, as U.S. insured losses in 2022 represented 75 percent of global insured losses, and the third year in a row the U.S. share topped 70 percent, reinsurance rate increases in the U.S. were among the highest–ranging from 15 percent to 25 percent for loss-free, non-CAT programs, to up to 45 percent to 100 percent for programs with CAT loss histories, according to Gallagher Re.[68]

The U.S. Property Catastrophe Rate-On-Line Index[69](RoL) is further indicating the cost of reinsurance coverage has climbed to a 266.9 RoL index value–a 30.1 percent increase in 2023 and nearly double the index value in 2017. Of concern, the RoL index value has surpassed the 255 index value in 2006 that followed the 2004-2005 hurricane seasons, which included Hurricane Katrina (the costliest insured loss event in history), and the 237 index value in 1993, which followed Hurricane Andrew.[70] Thus, the RoL index value has reached the highest point ever since 1990 when Guy Carpenter began maintaining this data.

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64 Retention generally refers to the amount of risk of loss an insurance company retains by means of noninsurance, self-insurance, or deductibles.

65 Reinsurance is simply insurance for insurance companies. It refers to when a primary insurance company purchases coverage from a reinsurance company to transfer risk of potential losses. Retrocession (aka retro), in turn, is reinsurance purchased by reinsurers from other reinsurance providers to further spread risk.

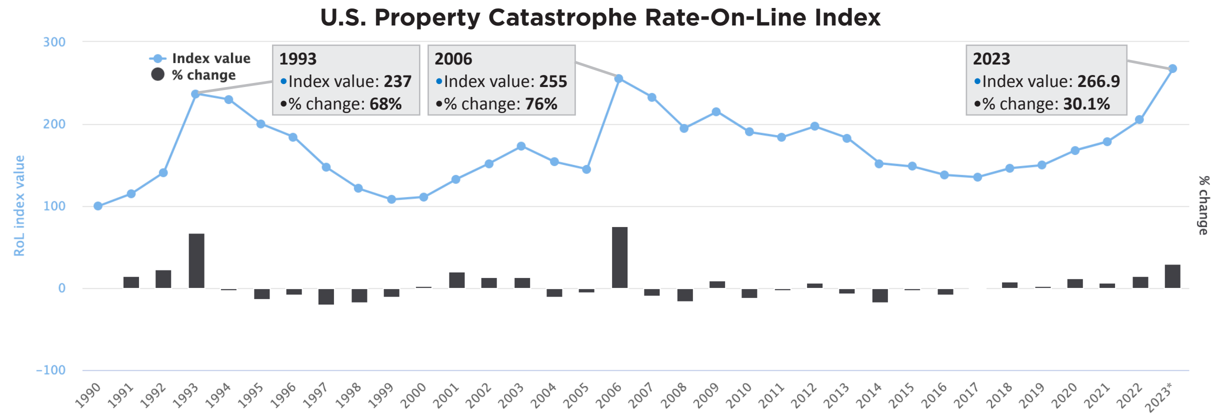
66 **https://www.businessinsurance.com/article/20230103/NEWS06/912354630/Reinsurers-hike-rates,-exclude-Russia-and-Ukraine-Brokers**.

67 Advisen (Jan 24, 2023) "Reinsurance rates jump at Jan. 1, with property prices up an average 50%: Brokers".

68 *Ibid*.

69 Guy Carpenter U.S. Property Rate on Line Index – is the proprietary index of US property catastrophe reinsurance Rate-on-Line movements, on brokered excess of loss placements, that has been maintained by Guy Carpenter since 1990. The index covers US property catastrophe renewals and measures the change in dollars paid for coverage year on year on a consistent program base. It is updated following January 1st renewals and July 1 renewals reflecting the full year, by calculating the change in RoL year on year across the same renewal base.

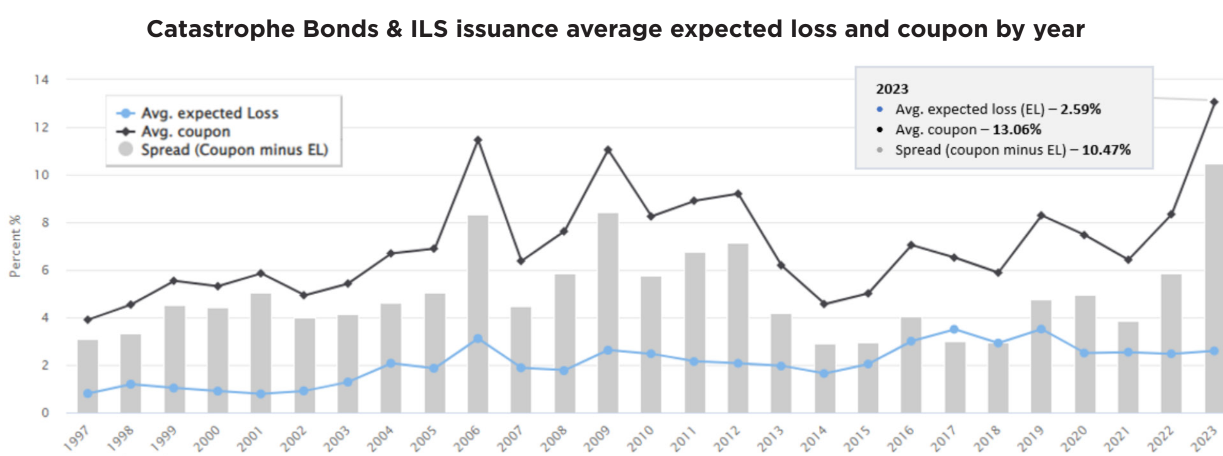
70 **https://www.artemis.bm/us-property-cat-rate-on-line-index/**.



Source: Data from Guy Carpenter, presented by Artemis.bm. (* Preliminary numbers.)

https://www.artemis.bm/us-property-cat-rate-on-line-index/

According to the Artemis Catastrophe Bond & Insurance-Linked Securities Deal Directory, newly issued bonds and insurance-linked securities (ILS) are similarly experiencing new highs for average coupon and spread. A bond's coupon rate generally refers to the annual income an investor may expect to receive while holding a given bond-further underscoring the significantly higher costs insurers are facing for nearly all forms of capital, which are contributing to current hard market conditions



Source: www.Artemis.bm Deal Directory.

https://www.artemis.bm/dashboard/cat-bonds-ils-expected-loss-coupon/.

Insurers that cannot place sufficient coverage to spread catastrophic risk may experience financial pressure suggesting higher rate need and/or other adjustments to reduce catastrophic exposure.

GROWTH IN NON-ADMITTED AND RESIDUAL MARKETS

As insurers continue to face increasing pressure in catastrophe-prone states, and in some states regulatory constraints or other challenges that have made it more challenging for insurers to manage growing exposure and costs, the non-admitted market and residual market plans are increasingly serving as a relief valve.

Before a company can do business in a state it must become licensed and meet minimum capital and surplus requirements. Companies which become licensed and authorized are referred to as "admitted" carriers and are subject to state regulation and are required to become members of the state guarantee association as a condition of licensing. Such associations provide guarantee funds, which provide coverage for policyholders when an admitted insurer becomes insolvent[71] and thus unable to pay policyholder claims.

In addition to admitted companies, some insurers choose to do business on a surplus lines (or "nonadmitted") basis, which means they are generally not subject to rate or policy regulation from the state insurance regulator. Instead, U.S. domiciled surplus lines insurers are subject to regulatory requirements and are overseen by their domiciliary state, then operate on a non-admitted basis in the other states in which the insurer offers policies. As a result, surplus lines carriers experience freedom of rate and form, which enables a surplus lines carrier to be innovative, creative, and responsive in developing a product that provides the level of coverage a consumer is seeking, while pricing the product in a financially responsible manner commensurate with the risk.

Additionally, as insurers cannot consistently sell high-risk products at a loss, many states may have a residual market as a safety net. Residual market plans are generally intended to be insurance markets of last resort in that they provide limited and temporary coverage for properties viewed as an extremely high insurance risk, until risk is reduced, and coverage can once again be obtained in the admitted market. Residual market plans often may grow in states where overregulation results in contracting markets or where other circumstances, such as volatile loss trends, lead to difficulty in estimating expected losses reliably.

Insurers have experienced such challenges and volatile loss trends in a growing number of states. As losses surged to record levels in recent years, seven property casualty insurance companies were placed into liquidation in 2022,[72] after eight property casualty insurance companies were put into liquidation in 2021.[73] Numerous other insurers have pulled back amid the current hard market cycle. The Louisiana Department of Insurance noted, of the eleven residential property insurance companies doing business in that state that became financially insolvent between July 2021 and September 2022, six were because they did not have adequate reinsurance to pay claims resulting from Hurricane Ida.[74]

Non-Admitted Market Growth (Excess & Surplus Lines)

A.M. Best's Surplus Lines Market Report of 2022 noted there have been no surplus lines carrier impairments[75] since 2004, suggesting surplus lines carriers continue to operate as a beneficial "safety valve for the admitted market". According to an analysis by S&P Global Market Intelligence, the U.S. excess and surplus (E&S) market constituted 8.7 percent of the country's total property and casualty industry during the first half of 2022, as direct written premiums surged to $37.6 billion in the first six months of 2022. This represents an E&S

71 "Insolvency" generally refers to when a company can no longer meet its financial obligations. The National Association of Insurance Commissioners (NAIC) considers an insurer insolvent if a state insurance commissioner has taken legal action to place the insurer into liquidation, rehabilitation, or conservatorship.

72 S&P Global Market Intelligence (Jan 30, 2023) "S&P: "Fla. homeowners market accounts for majority of insurers liquidated in '22 EXCLUSIVE".

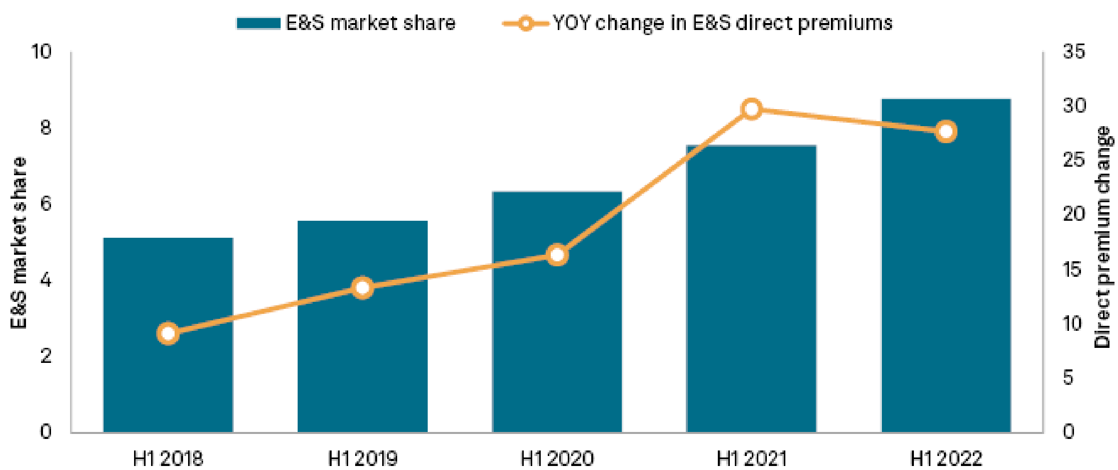
73 S&P Global Market Intelligence (Jan 31, 2022) "S&P: "Receivership roll call, 2021 EXCLUSIVE".

74 **https://app.lla.state.la.us/publicreports.nsf/0/9d5c25a709f476a3862588da005c6930/$file/000283c0.pdf**.

75 An impaired insurer generally refers to a company that potentially may be unable to fulfill its policy obligations and has been placed under rehabilitation or conservation.

premium growth of 27.6 percent versus the same prior-year period; a substantially larger rate of growth than the total U.S. P&C market (excluding E&S premiums), which grew by only 8.4 percent in the same period.[76]

E&S premiums are growing share of property and casualty insurers' premiums (%)



Data compiled Oct. 28, 2022.

E&S=excess and surplus.

Entities are deemed excess and surplus writers if it has an acive status of not licensed, eligible surplus lines or domestic surplus lines insurer within Schedule T-Exhibit of Premiums Written.

Industry data excludes excess and surplus premiums written though Lloyd's of London.

Source: S&P Global Market Intelligence.

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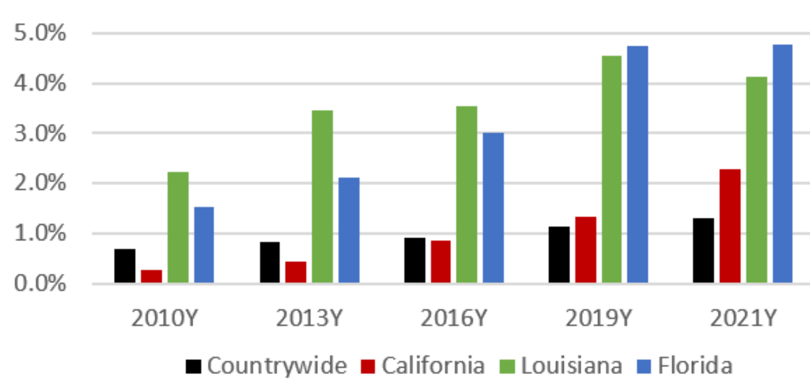
While the majority of premiums written in the E&S market have traditionally covered complex or high-risk businesses–often within commercial lines, such as commercial property,[77] general liability or excess liability lines–the E&S market has experienced significant growth in personal lines.

For example, between 2017 through 2021 California experienced a 30.7 percent five-year compound annual growth rate (CAGR) in the homeowners lines of business.

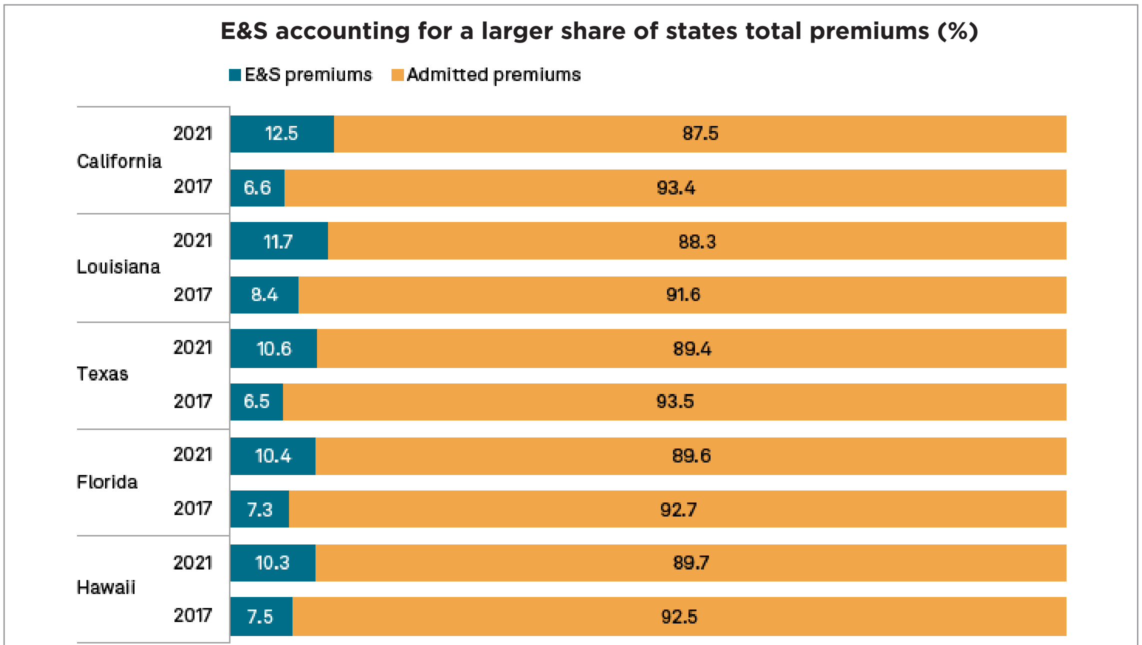
E&S Percent of Property Casualty Industry Direct Premiums Written (for Homeowners line)
Countrywide vs select states



Source: APCIA via S&P Global Market Intelligence.

76 S&P Global Market Intelligence (Nov 30, 2022) "E&S premiums accounting for larger share of US property and casualty market".
77 Commercial Property includes Fire, Allied Lines, Commercial Multi-Peril (CMP) Property, Farmowners, and Inland Marine.

When combined with growth in other lines, California now ranks as the state with the largest E&S share of total premiums, or 12.5 percent,[78] followed by Louisiana, Texas, Florida, and Hawaii–states that each face significant exposure to natural catastrophes.



Source: S&P Global Market Intelligence.

Residual Market Growth

Residual market plans have similarly experienced significant growth. However, the expansion of policies in residual market plans weighs heavily on admitted insurance companies, as the concentration of high-risk properties could result in substantial losses in any given year. Should losses exceed a residual market plan's claims paying capacity, assessments might be made against admitted market insurers, forcing those insurers (and ultimately their policyholders) to pay the shortfall.

Driven in large part by the current hard reinsurance market cycle, a growing number of residual market plans are experiencing increasing financial stress. For example, a Louisiana Legislative Auditor report noted Louisiana Citizens, the state's residual market plan, may not have adequate reinsurance to pay claims if a major hurricane occurs, due to the higher number of policies and problems in the reinsurance market.[79] In October, Citizens' Executive Director noted that "[n]ow, 89 cents of every premium dollar compared to 20 cents in 2019 is spent on reinsurance (for Citizens)."[80]

Similar challenges are emerging in residual market plans in other catastrophe-exposed states,[81] which is resulting in higher costs that may need to be passed on to policyholders within these plans. However, should a major disaster occur, the likelihood and magnitude of potential assessments continues to grow for admitted insurers and their policyholders, adding another layer of financial stress for the industry.

78 S&P Global Market Intelligence (Nov 30, 2022) "E&S premiums accounting for larger share of US property and casualty market".
79 https://app.lla.state.la.us/publicreports.nsf/0/9d5c25a709f476a3862588da005c6930/$file/000283c0.pdf.
80 https://www.nola.com/news/hurricane/louisiana-citizens-rate-increases-will-be-as-high-as-111-in-some-parishes/article_4271d64a-5703-11ed-b1ca-c736ff2e5138.html.
81 https://www.eenews.net/articles/growing-storms-push-shrinking-la-insurers-into-failure/.

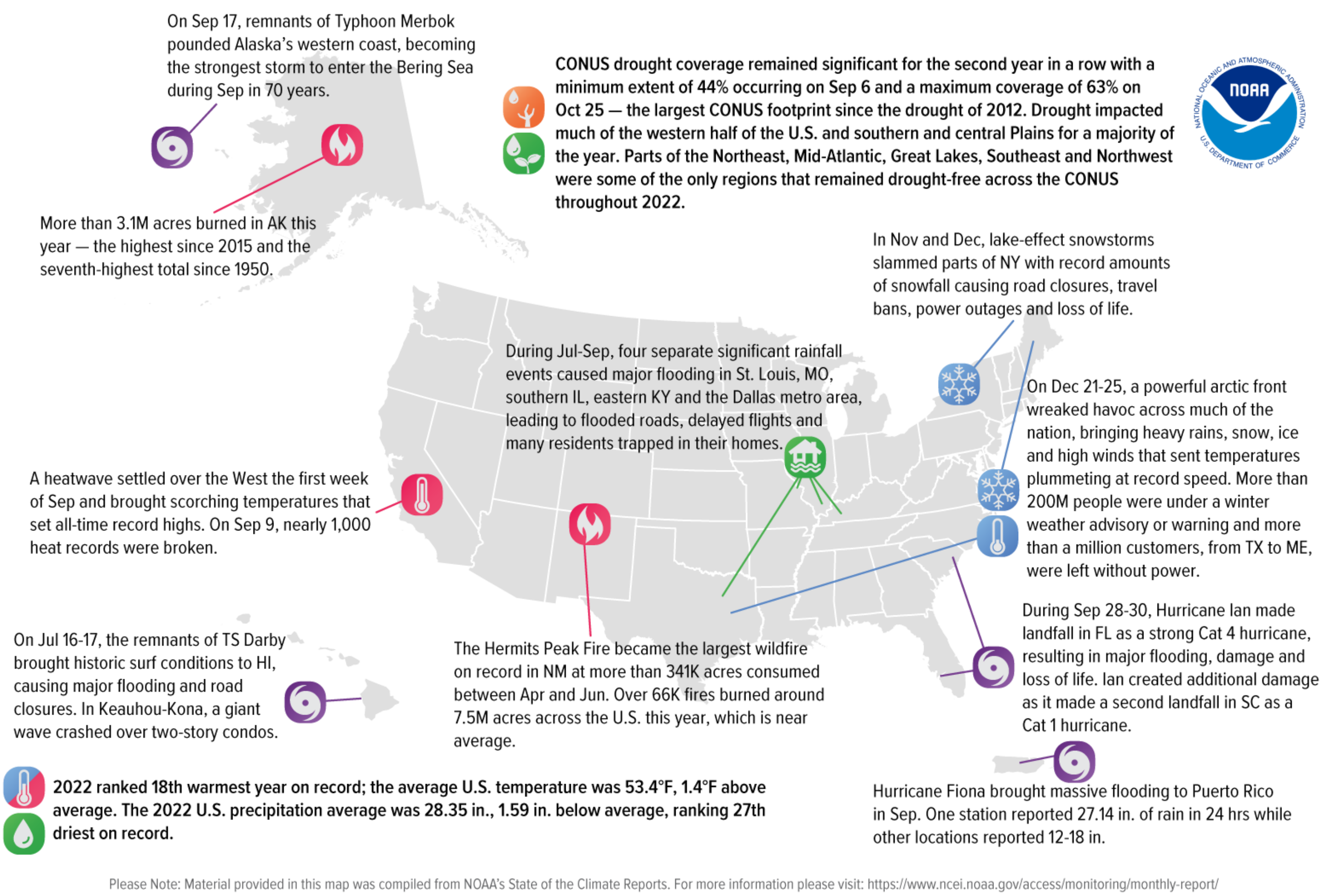
CLIMATE IMPACTS

Natural catastrophes, whether they be extreme heat, cold or precipitation levels, proved to be just a sampling of extreme weather anomalies that are becoming increasingly more common in the U.S. and around the world, leading to more devastation in communities. As records continue to break and losses accrue from weather-related disasters, insurers and other stakeholders across the industry are looking to understand the various factors contributing to increasing losses year after year.

Two main themes have consistently emerged as leading contributors: population growth in hazard-prone areas such as the Gulf Coast and the Wildland Urban Interface (WUI), in addition to escalating frequency and severity of weather-related disasters due to climate change. (Weather-related disasters include floods, hurricanes, tropical storms, tornados, wildfires, droughts, winter storms, and extreme temperatures.)[82]

According to the National Aeronautics and Space Administration (NASA), Earth's average surface temperature in 2022 was tied with 2015 as the fifth warmest year since recordkeeping began in 1880. It was also the warmest year on record when there was a La Niña trade winds pattern, which generally has a cooling effect on temperature.

U.S. Selected Significant Climate Anomalies and Events for 2022



Source: **https://www.ncei.noaa.gov/news/national-climate-202212**.

82 **https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_study.pdf**.

FUTURE CLIMATE TRENDS

The planet's continued warming trend is affecting the frequency and severity of natural disasters. Numerous studies have shown hurricanes are increasing in strength, drought conditions are becoming more widespread and persistent, wildfires are intensifying, and sea levels are rising, affecting storm surge and coastal properties. NOAA predicts that by 2050 sea levels will rise by an average of 10 to 12 inches and up to $106 billion of coastal property in the U.S. will likely be underwater.[83]

Catastrophe modeling company Karen Clark & Company (KCC) developed climate modeling catalogs for the perils most impacted by climate change – hurricanes, floods, and wildfires–with projections out to 2050 for different emissions scenarios provided by the Intergovernmental Panel on Climate Change (IPCC). The findings suggest that wildfire losses in the U.S. will increase more than 100 percent on average, although the impacts will vary by region.[84] Hotter and drier conditions across the western U.S. are already resulting in fires igniting more easily and spreading more rapidly due to extremely dry vegetation. Fire season, a period that has historically been viewed in the western U.S. as May through October, is now widely viewed to be year-round.

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KCC's research also indicates that climate change is increasing the severity but not the frequency of hurricanes, while coastal flooding will be exacerbated by sea level rise.[85] Scientists expect increasing wind speeds to increase the proportion of storms that intensify into Category 4 or Category 5 storms. As inland flood frequency and severity are projected to rise from tropical cyclones and heavy precipitation, this will pose a challenge for companies that insure flood, and residents who live in low-lying areas.[86]

DISPLACEMENT FROM NATURAL DISASTERS

These trends will pose a growing challenge for all, as higher proportions of the population face the dire consequences of more frequent and severe natural disasters. U.S. Census Bureau research suggests over 3.4 million people (more than 1.4 percent of the adult population of the U.S.), were displaced by natural disasters in 2022.[87] These figures are based on the Census Bureau's Household Pulse Survey,[88] and include displacement by hurricanes, floods, wildfires, tornados, and other disasters.

The survey showed people were displaced from every state in 2022, despite 29 states not having any major disasters that involved FEMA. Florida, hit by Hurricane Ian, and Louisiana, which did not experience a major hurricane in 2022, were the states with the greatest proportion of residents displaced. Although most displacements were relatively short, lasting less than a week for 40 percent of people, about 16 percent of the displaced adults have not returned home and 12 percent were out of their homes for longer than six months. Also, the survey indicated households earning less than $25,000 per year had the highest displacement rates for any income level, underscoring the disproportionate impacts natural catastrophes pose for economically disadvantaged populations.

83 **https://coast.noaa.gov/states/fast-facts/climate-change.html**.
84 **https://news.ambest.com/newscontent.aspx?refnum=246696&altsrc=23**.
85 BestWire (Dec 14, 2022) report.
86 *Ibid.*
87 **https://www.scientificamerican.com/article/disasters-displaced-more-than-3-million-americans-in-2022/**.
88 Census Bureau Household Pulse Survey: 20-minute online survey developed in 2020 to study social and economic issues impacting households across the country. 2022 results are based 68,500 responses from early January 2023.

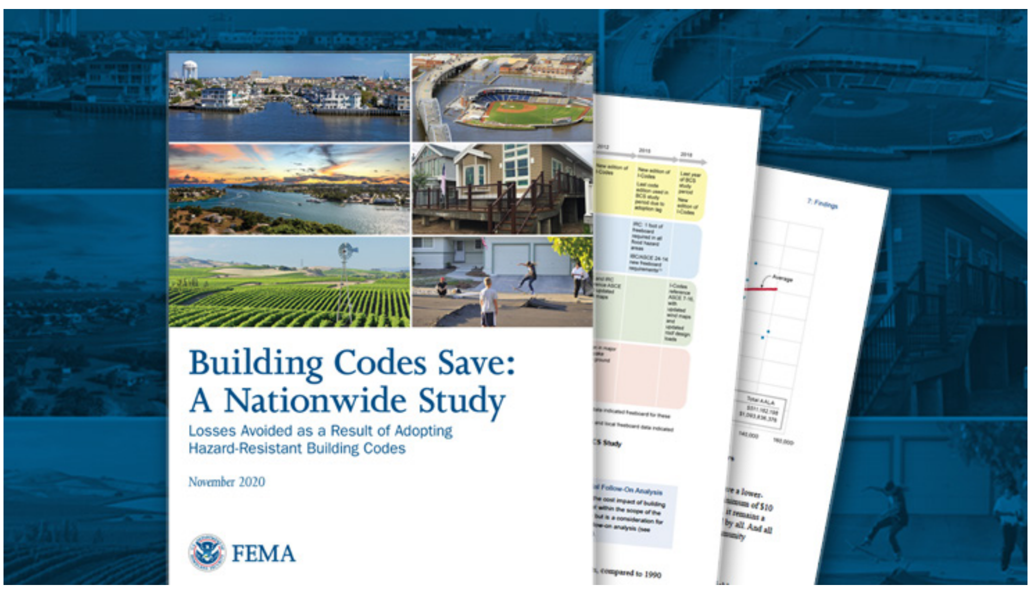
KEY SOLUTIONS PROVE BENEFICIAL

With climate change impacts showing no signs of easing, the insurance industry has placed a substantial focus on mitigating future loss costs to help keep families and communities safe and ensure the private insurance market remains well positioned to provide financial protection against these events.

Recent years have underscored the need for public and private stakeholders across the industry to work together to make communities more resilient. This should include better community planning, community-wide adoption of hazard-resistant building codes in catastrophe-prone areas, and increased fuels management in regions exposed to wildfires, as well as programs to support property owners in hardening existing homes and businesses.

BUILDING CODES

Insurers believe communities must begin to adapt to growing climate impacts now, by adopting and enforcing stronger building codes in high-risk areas. The insurance industry has long been at the forefront of research to understand how to mitigate risk to reduce future losses, whether from hurricanes, earthquakes, or any other natural disasters. Through the Insurance Institute for Business & Home Safety (IBHS), the insurance industry has developed scientifically proven standards that enable homes and businesses to withstand increasingly severe storms, such as a Cat 5 hurricane. As more communities are hardened, this should result in a meaningful decrease in losses, which should translate to more affordable and available coverage for consumers.



Source: **https://www.verisk.com/insurance/visualize/fema-study-shows-stringent-building-codes-save-billions-in-losses-from-natural-disasters/**.

The National Institute of Building Sciences (NIBS) has similarly shown that every $1 spent on natural hazard mitigation in new code construction can save $11 in disaster repair and recovery costs. In 2020, FEMA released a report titled, “Building Codes Save: A National Study”. The study shows that building in compliance with modern building codes leads to major reductions in property losses from natural disasters and focused on three dominant natural hazards in the United States: floods, hurricane winds and earthquakes.

The International Code Council shared the following takeaway of the study:

> *FEMA reported that if all new construction adhered to modern building codes, the nation would save more than $600 billion by 2060. Per the Agency's summary: "Adopting building codes is the single most effective thing we can do! One change in building codes can save lives and protect property for generations to come."*

MITIGATION IN ACTION

Based on decades of research, IBHS developed their **FORTIFIED** program–a voluntary, research-based certification program that provides enhanced construction standards, typically exceeding current building standards–to provide additional protection from severe weather including hurricanes, hail, thunderstorms, and lower-level tornadoes. The FORTIFIED program offers three levels of resilience–Bronze, Silver, and Gold, with programs available for residential homes, commercial buildings, and multifamily housing.

The National Standard for Resilience	FORTIFIED Roof	FORTIFIED Silver	FORTIFIED Gold
Enhanced Roof Deck Attachment	✓	✓	✓
Sealed Roof Deck	✓	✓	✓
Locked Down Roof Edges	✓	✓	✓
Impact-resistant Shingles Rated by IBHS**	✓	✓	✓
Wind and Rain-Resistant Attic Vents	✓	✓	✓
Impact Protection for Windows & Doors*		✓	✓
Impact* & Pressure-Rated Garage Doors		✓	✓
Chimney Bracing		✓	✓
Reinforced Soffits*		✓	✓
Anchored Attached Structures		✓	✓
Gable End Bracing		✓	✓
Pressure-rated Windows & Doors*			✓
Stronger Exterior Sheathing*			✓
Engineered Roof-to-Wall Connections			✓
Engineered Story-to-Story Connections			✓
Engineered Wall-to-Foundation Connections			✓

* Required in Hurricane Prone Areas Only
** Required in Hail Prone Areas Only

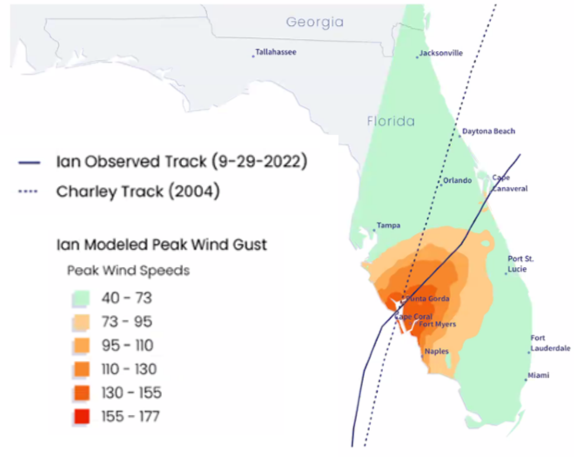
Find a Professional

Source: https://fortifiedhome.org/solutions/.

Each program consists of specific requirements that must be met and verified by a third-party to meet the FORTIFIED designation. A FORTIFIED designation may qualify the property owner to receive financial incentives such as grants, tax credits, and insurance premium credits.

In the years since Hurricane Andrew struck southeast Florida in 1992, Florida has become known for developing some of the strongest building codes in the nation to protect against wind damage, with the most recent update occurring in 2020. The updates implemented in the last two decades include roof underlayment and decking requirements, stronger roof-to-wall connections, more impact-resistant windows, and hurricane shutters–mitigation that the science of IBHS has shown to be core resilience measures.

In 2022, Hurricane Ian provided an excellent opportunity to demonstrate the performance of homes (re)built with stronger building codes. The area where Hurricane Ian made landfall as a category 4 storm was nearly the same location that Hurricane Charley in 2004 came ashore, also as a Category 4 storm. As such, many homes in the area of Ian's landfall were reconstructed to newer codes after they were damaged or destroyed in Hurricane Charley in 2004, particularly in Charlotte County.[89] Additionally, according to Gallagher Re Chief Science Officer Steve Bowen, in the counties where Ian came ashore, as much as 50 percent of its current population arrived over the past 22 years, so a sizable number of structures were built to newer, better codes versus those of the late 1990s and early 2000s.



Source: CoreLogic (Command Central: Hurricane Ian, Sep 30, 2022).

Compared to Charley, the severity of wind damage sustained during Ian was considerably less and there were fewer partial and total roof failures resulting from Ian.[90] Commercial and residential properties with mitigation measures such as flood vents, updated roofs and hurricane shutters inherent to their construction were able to withstand the storm's wrath and limit damage.[91] For example, in a report by data analytics company CoreLogic, wind losses in Lee County, one of the coastal counties that sustained the most damage from Ian, were twice as high for structures built before 1996.[92]

In one image, State University of New York Distinguished Professor Michel Bruneau tracked the age of homes in one area of Fort Myers Beach. It shows 18 homes built before 1981 that were completely wiped away by the storm. But one house, built in 2020, appears to be almost unscathed,[93] underscoring the cost savings newer codes provide from loss avoidance.

Image: Aerial photograph of Fort Myers Beach following hurricane Ian

Source: **https://www.insurancejournal.com/news/southeast/2022/10/17/690281.htm**.

89 **https://www.insurancebusinessmag.com/us/news/catastrophe/silver-linings-from-hurricane-ian-one-of-the-strongest-hurricanes-to-ever-make-landfall-in-the-us-429571.aspx**.

90 **https://www.insurancejournal.com/news/southeast/2022/10/17/690281.htm**.

91 Aon 2023 Weather, Climate and Catastrophe Insight.

92 **https://www.insurancejournal.com/news/southeast/2022/10/17/690281.htm**.

93 *Ibid.*

Community Spotlight: Babcock Ranch, Florida

The greatest illustration of resilience following Hurricane Ian was Babcock Ranch–a 2,000-home community built 12 miles northeast of Fort Myers, Florida, and only 35 miles (as the crow flies) from where Ian made landfall in Cayo Costa. The community features a variety of neighborhoods from different home builders, and prices generally range from the $300's to over $2M, including condos, townhouses, and single-family homes.[94] Touted as the first fully sustainable and "hurricane-proof" community, the developer set out to design a community that protects natural habitats and works together with the surrounding environment.[95]

Key design features of the community:

- ***Structural hardening -*** *All of the buildings are designed to withstand 160 mph winds, exceeding recent Florida building codes to withstand hurricane force winds up to 145 mph.*
- ***Flood control -*** *The community is located 30 miles inland and homes are 25 to 30 feet above sea level to avoid storm surge. Retaining ponds and native landscaping are used to control stormwater and prevent flooding, while roads are designed to flood during storms rather than the homes.*
- ***Infrastructure -*** *In addition, the community is powered by 700,000 solar panels and utility lines run underground to help prevent power outages during storms.*

In the aftermath of Hurricane Ian in 2022, the community received considerable attention because the community never lost power, experienced no flooding, and sustained minimal damage.[96] In the days after Hurricane Ian hit Southwest Florida, inspectors from the Federal Emergency Management Agency visited Babcock Ranch in Charlotte and Lee counties, arguably the two most impacted by the Category 4 storm. Seeing little damage at the residential community, officials determined the storm had inexplicably missed the 17,280-acre (69.9 km sq) planned development.[97]

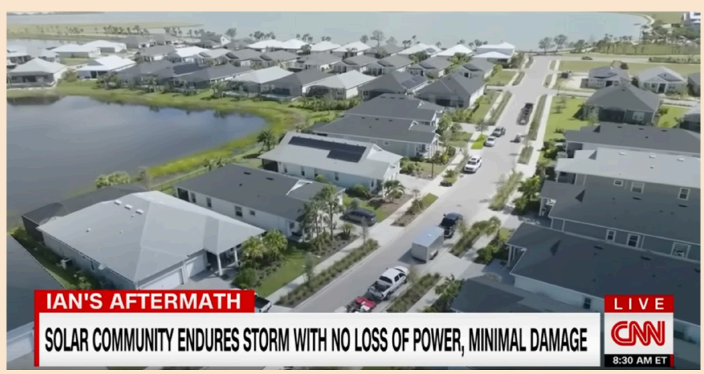


Photo Credit: **https://www.floridaforboomers.com/babcock-ranch-hurricane-ian**.

94 **https://www.floridaforboomers.com/babcock-ranch-hurricane-ian/**.

95 60 Minutes special, October 9, 2022 **https://archive.tveyes.com/18120/3449808-38915/6265249f-a16c-4859-a87f-87e750310ec6/WCBS_10-09-2022_19.21.59.mp4**.

96 **https://www.wptv.com/weather/hurricane/babcock-ranch-hurricane-ian**.

97 **https://urbanland.uli.org/public/hurricane-ian-showed-the-importance-of-building-for-resiliency-in-south-florida/**.

In 2022, IBHS launched their **Wildfire Prepared Home**™ program – a voluntary, research-based certification program designed to meaningfully reduce wildfire risk. Like IBHS' FORTIFIED program, the Wildfire Prepared program helps homeowners protect their homes through evidence-based home hardening techniques focused on a home's roof and building features and defensible space. In creating and maintaining a critical 0–5 ft noncombustible buffer area referred to as the "home ignition zone", homeowners can protect the building from ignition which is often caused by wind-blown embers that can accumulate at the base of the exterior wall, and from exposure to radiant heat or direct flame contact that would occur due to the ignition of combustible materials located near the building or under an attached deck or combustible fence. According to decades of research, science has shown that, when taken together, these actions can help reduce vulnerabilities to heat, flames, and embers that often may lead to a total loss when a home ignites.

Launched initially in California, the Wildfire Prepared Home program plans to expand to additional states, though homeowners in any state can still benefit from following the program requirements.

Community Spotlight: Paradise, California

In November 2018, the Camp Fire devastated the town of Paradise, California, located 90 miles north of Sacramento. The fire destroyed more than 18,000 homes and structures, tragically resulted in 85 deaths (becoming the deadliest fire in California history) and displaced many of the town's 26,500 residents.

Working with IBHS to achieve greater resilience in the aftermath of loss, the town of Paradise is rebuilding the community to a higher building and defensible space standard. On June 22, 2023, a home in Paradise became the first in the country to receive the new "wildfire-prepared home" designation.[98] *Additionally, Paradise became the first community to incorporate the Wildfire Prepared Home framework into local ordinance, which requires as of July 14, 2022, all new homes built in Paradise to achieve and maintain the IBHS Wildfire Prepared Home designation.*[99]

Key elements of the program include:

- ***Fire-resistant materials –*** *Class-A fire-rated roof and building features such as ember- and flame-resistant vents and eves.*
- ***Defensible space –*** *Must be established and maintained by eliminating all flammable materials within the home ignition zone (HIZ), which is the space from the edge of the exterior walls to a distance of 5 feet from the building.*

For the homes rebuilt prior to July 14, IBHS is working with FEMA on a grant program to aid homeowners in retrofitting their homes to meet the new designation.

Photo Credit: **https://www.sfgate.com/california-wildfires/article/Paradise-home-is-first-to-be-wildfire-prepared-17263738.php**.

98 **https://www.sfgate.com/california-wildfires/article/Paradise-home-is-first-to-be-wildfire-prepared-17263738.php**.

99 **https://www.townofparadise.com/sites/default/files/fileattachments/recovery/page/42447/press_release_wildfire_prepared_home_designation_program_7.15.22.pdf**.

CLOSING

Despite increasing frequency and severity of natural disasters, insurers are working to develop new and innovative solutions to meet policyholders needs, while advocating for mitigation to reduce losses. A meaningful reduction in losses should positively impact the affordability and availability of insurance.

In the near-term, amid rising inflation, supply chain issues and increasing natural disasters, the current pressure on loss ratios may require insurers to evaluate the need for rate adjustments and stricter underwriting. However, a growing body of evidence suggests mitigation provides a strong long-term solution to reduce future losses.

Insurers overwhelming priority is to help protect what matters most–families and communities–and will continue to support communities prepare for risks and help their customers rebuild their lives and restore their property when natural disaster strikes.

AUTHOR

This report was produced in partnership between the American Property Casualty Insurance Association (APCIA) and Robert Hartwig, PhD, CPCU.

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The **American Property Casualty Insurance Association (APCIA)** is the primary national trade association for home, auto, and business insurers. APCIA promotes and protects the viability of private competition for the benefit of consumers and insurers, with a legacy dating back 150 years. APCIA members represent all sizes, structures, and regions— protecting families, communities, and businesses in the U.S. and across the globe. **https://www.apci.org/**

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