

What the hail is going on?!

- Why severe convective storm loss has been increasing
- Using catastrophe models to quantify current and future risk
- Leveraging catastrophe models and claims experience to manage exposure to frequency perils



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Agenda for “What the hail?!”

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- Leveraging catastrophe models and claims experience to manage exposure to frequency perils

SCS trends

Amy Green | June 5, 2023



Gallagher Re

Large SCS losses have been increasing exponentially

- Substantial growth in PCS SCS losses:
- **+11.5%** annual growth rate
- **7x** growth since 2003

Weather shocks on the rise

The annual tally by Munich Re is higher than the average of \$97 billion in insured losses over the previous five years and exceeds an initial estimate of \$115 billion last month by rival Swiss Re.

"Weather shocks are on the rise," Ernst Rauch, chief climate scientist at Munich Re, told Reuters. "We can't directly attribute any single severe weather event to climate change. But climate change has made weather extremes more likely."

Allstate posts July cat loss of \$233mn from 12 mostly wind, hail events

Allstate estimates April cat losses at \$316mn

Allstate has pegged its expected pre-tax catastrophe losses for April at \$316mn from 14 events, including wind, hail and tornadoes in Texas and the southeast, down almost 42% year-on-year from the \$544mn of losses in April 2021, when the insurer was heavily hit by one large hail event impacting Texas and Oklahoma.

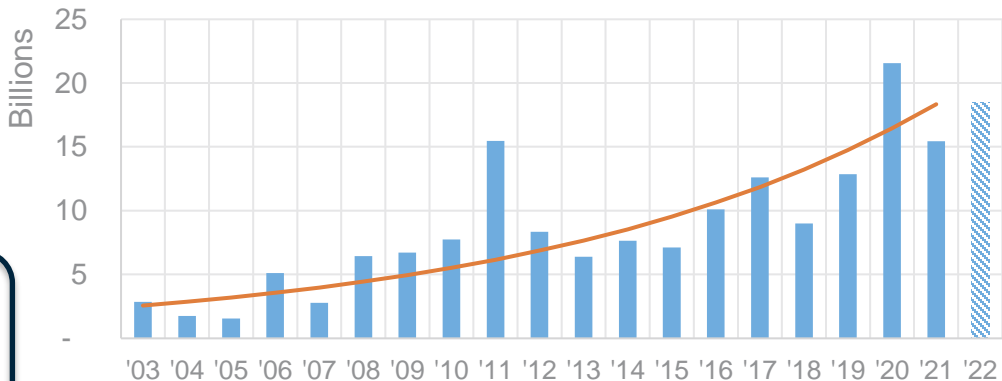
Inflation, cat losses push Liberty Mutual to Q2 underwriting loss as CoR jumps to 105%

Liberty Mutual reported a 6.9-point deterioration in its headline combined ratio to 105%, driven higher by rising inflation and \$1.1bn in catastrophe losses, largely due to major wind and hail events across the Midwest.

Nat cat losses of \$115bn in 2022 exceeded 10-year average again: Swiss Re

Hurricane Ian contributed about half of the total, with an estimated \$50bn-\$65bn. Secondary perils including floods and hailstorms added the remaining \$50bn, "yet again affirming their significant contribution to the global total", Swiss Re said.

PCS Personal Lines Severe Storm Event History



What is driving the increase in SCS loss?



Climate

Are there more events or are they worse?
Tornado vs. hail trends



Exposure Trends

Housing increases and TIV
Population shift / urban sprawl



Damageability Trends

Aging housing stock
Loss cost trends



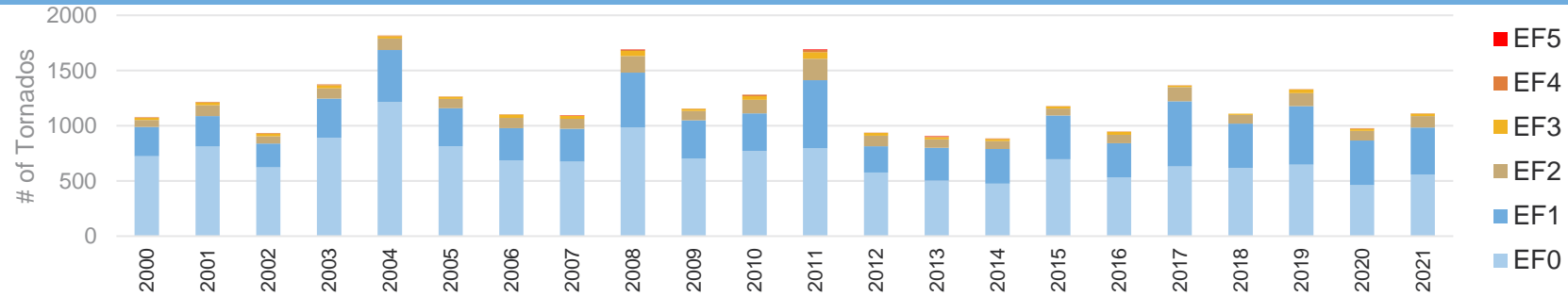
Unexplained

Neighboritis, unscrupulous contractors
Regional hail frequency changes

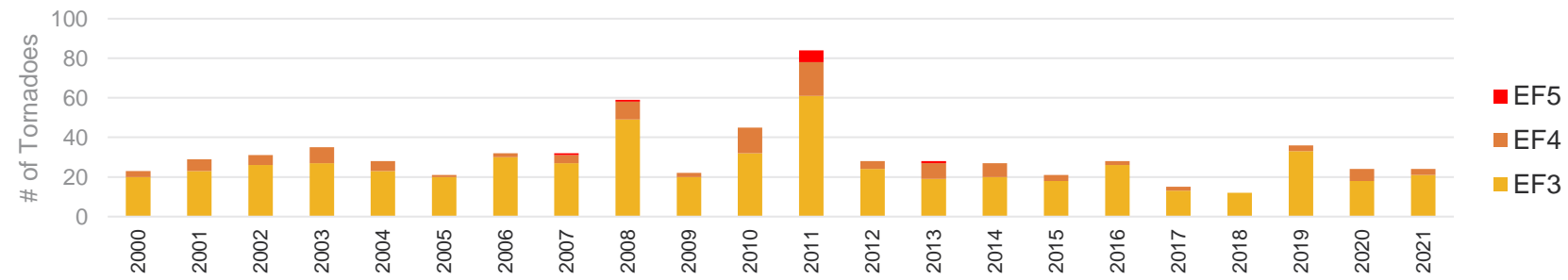
Rates of tornado activity have been stable

Number of Tornadoes

Tornado frequencies have not increased over recent history



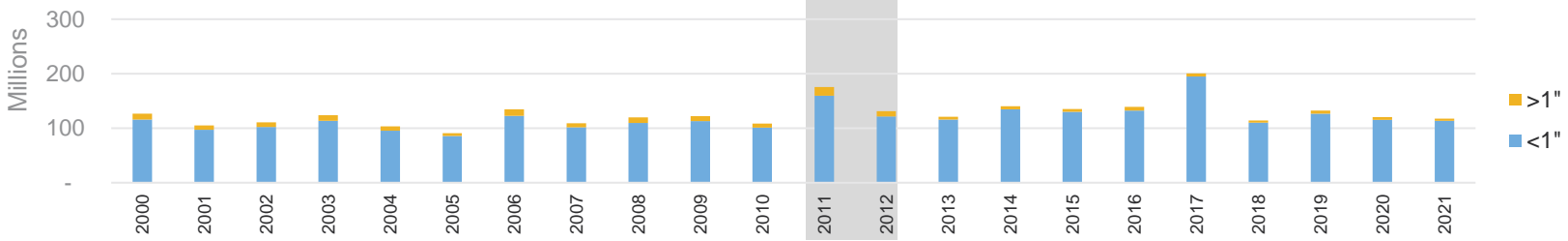
More destructive / higher magnitude tornadoes have also been in line with historical levels



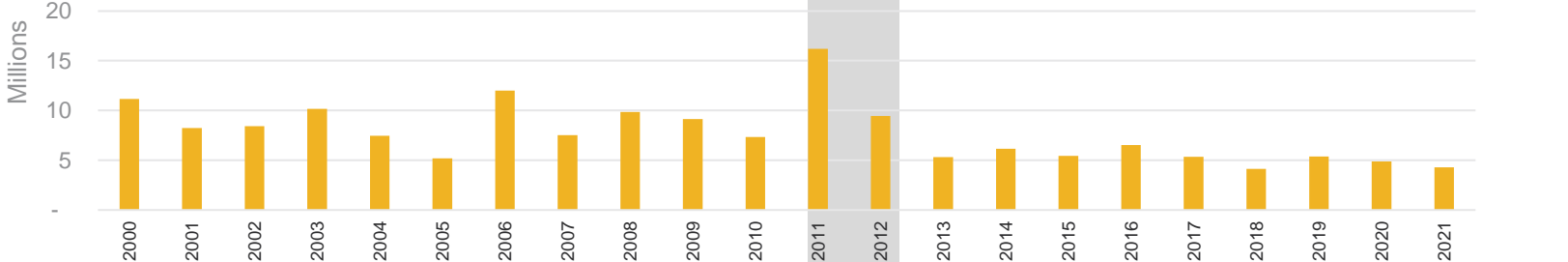
Frequency and severity of hail have not increased

Number of risks/buildings affected by radar hail

All Hail Events



Hail Events > 1"



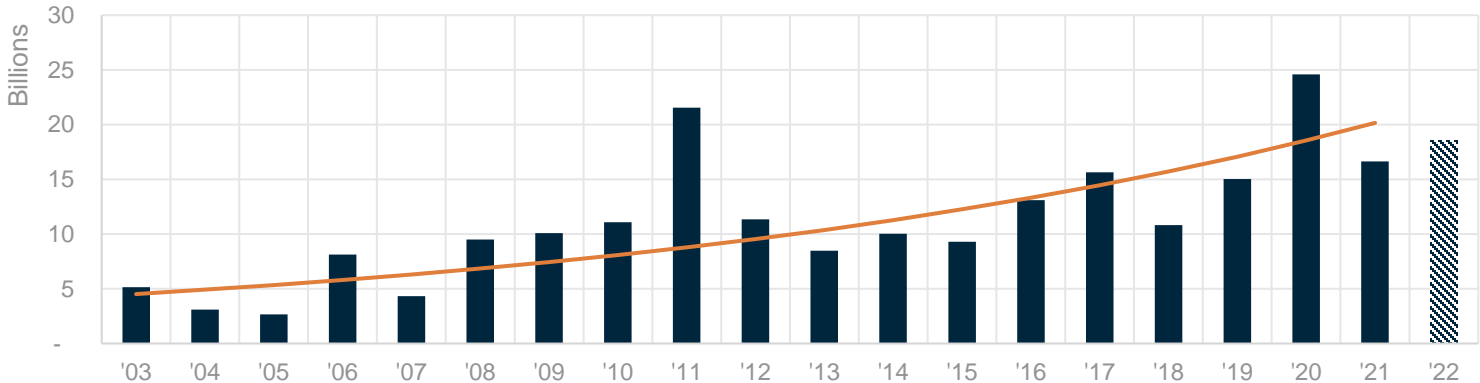
Note: The entire US radar network was upgraded to dual-polarization technology between 2011 and 2013. In addition, different models were used by NOAA to process radar data before and after 2011. Calculations are based on constant exposure data set

Radar data show no clear trend of changing hail propensity over recent history

Exposure changes account for only part of the increase

- Adjusting for inflation and housing unit growth by state accounts for 1/3 of the increase in losses
 - 8.5% annual growth rate still unexplained
 - 4.5x growth since 2003
 - Impact on losses = **~3.0%**

PCS Personal Lines Severe Storm Event History
Trended for housing unit growth & CPI



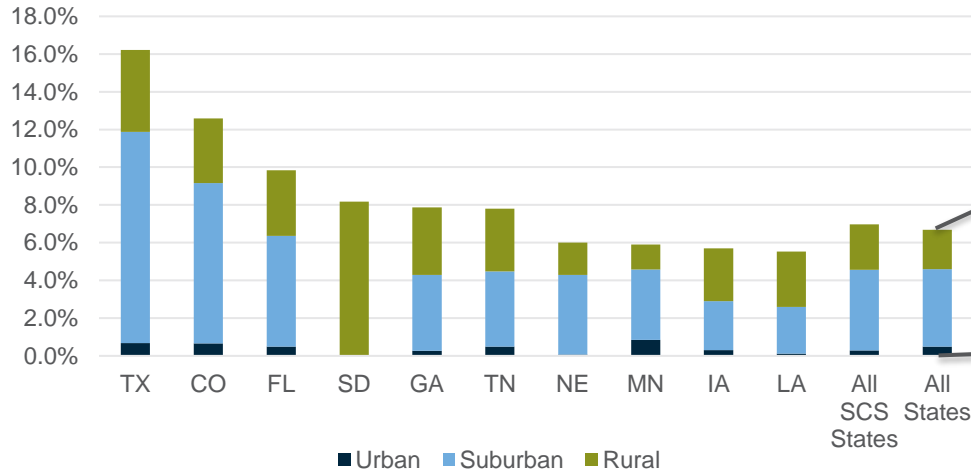
*Losses are personal lines only; as of December 2022
Trending adjusts historical losses for exposure growth based on housing unit by state (BLS census data) and CPI*

Exposure trends:

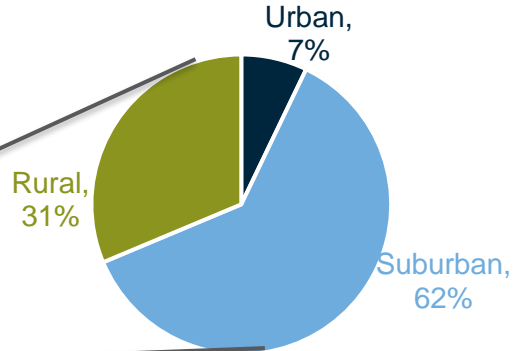
Suburbs continue to expand

- Majority of housing growth is concentrated in suburban areas
- Larger concentrations of exposure leads to increasing PCS losses

Growth of Housing Units % ('10-'20)



Housing Unit Growth ('10-'20)

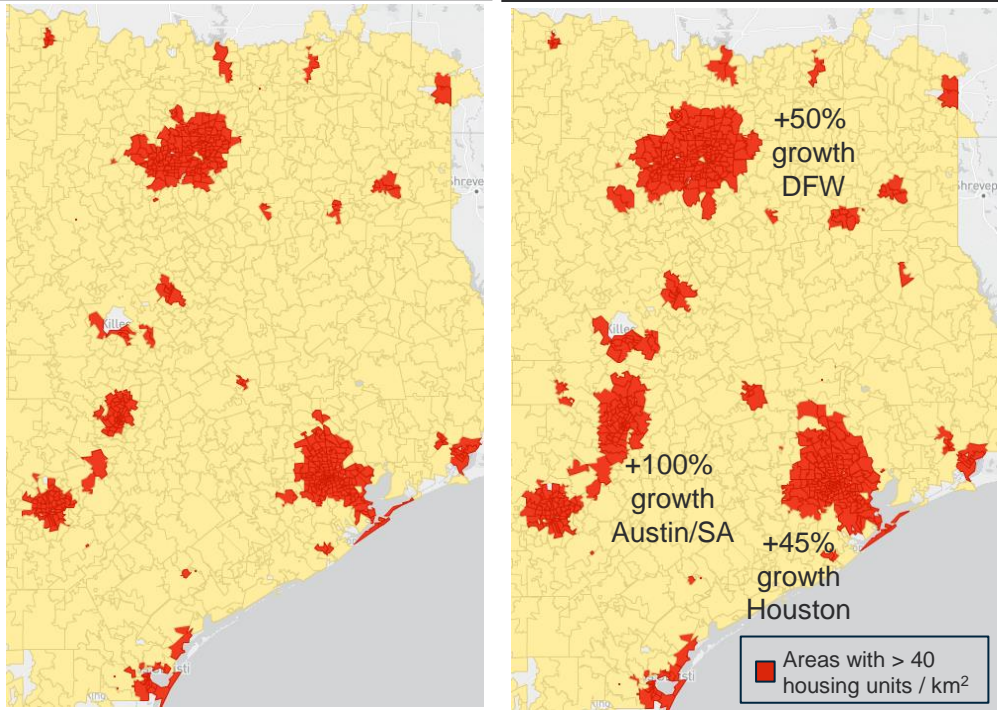


Urban: within 3 miles of major city (450k population)
 Suburban: between 3-30 miles of major city, with >40 housing units per km²
 Rural: all else

Source: 2010 & 2020 BLS census data

Exposure trends: Suburban increase in Texas

Urban / Suburban areas - 2000 Urban / Suburban areas - 2020

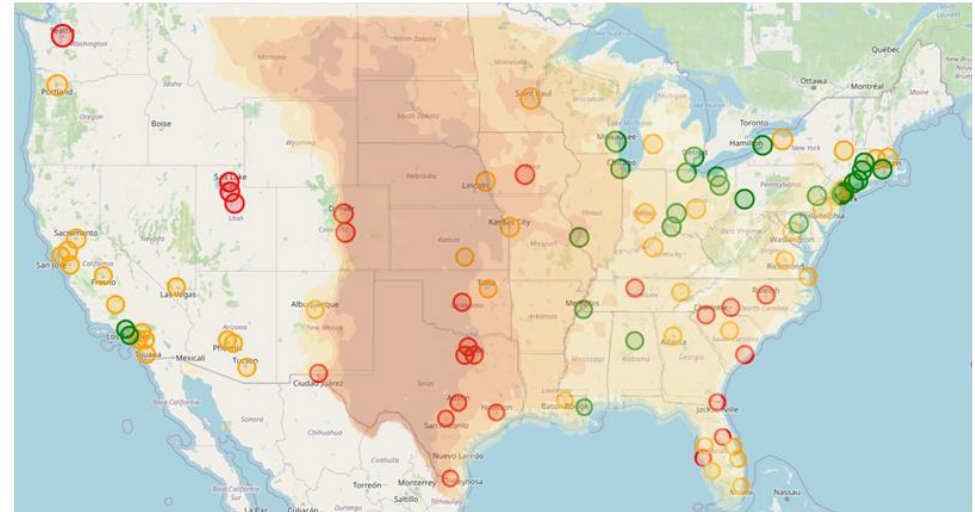
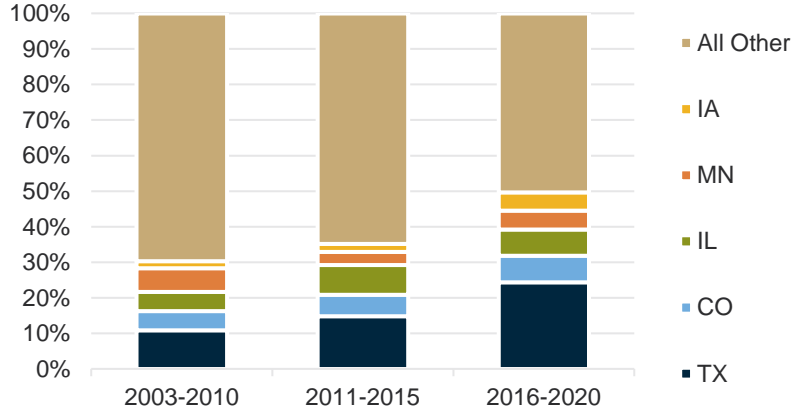


- Substantial growth in areas with significant density
- Continued urban sprawl drives increasing exposure to PCS loss events

Impact of urban sprawl

- Increasing proportion of PCS losses coming from Texas and Colorado
- Cities with highest growth located in areas with high SCS risk
- Impact on PCS losses = **1.5%**

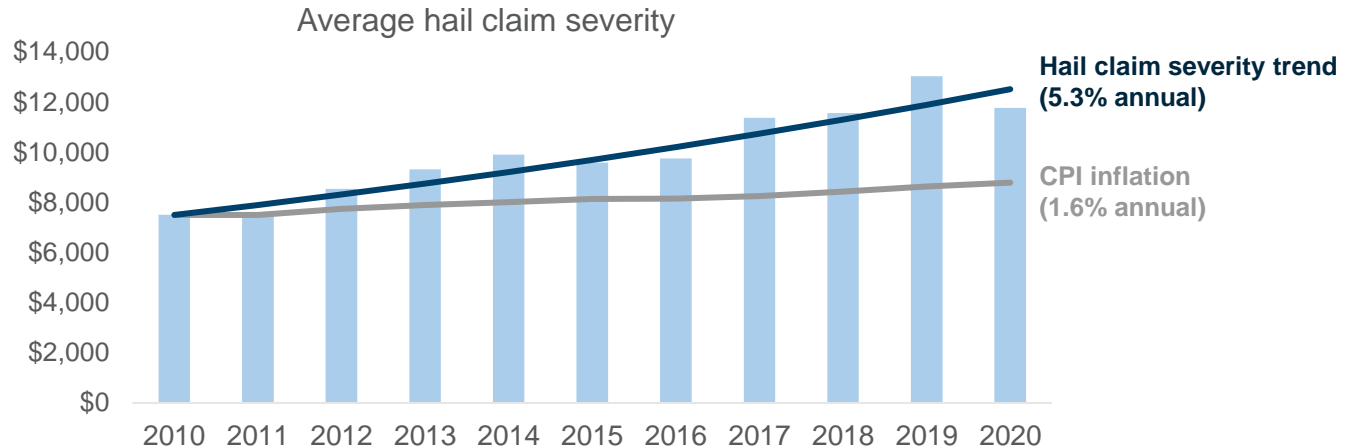
Distribution of PCS losses by state



Each circle represents city with >500k population
 >12% housing unit growth ('10 - '20)
 5% - 12% housing unit growth ('10 - '20)
 <5% housing growth ('10 - '20)

Hail severity trend exceeds CPI

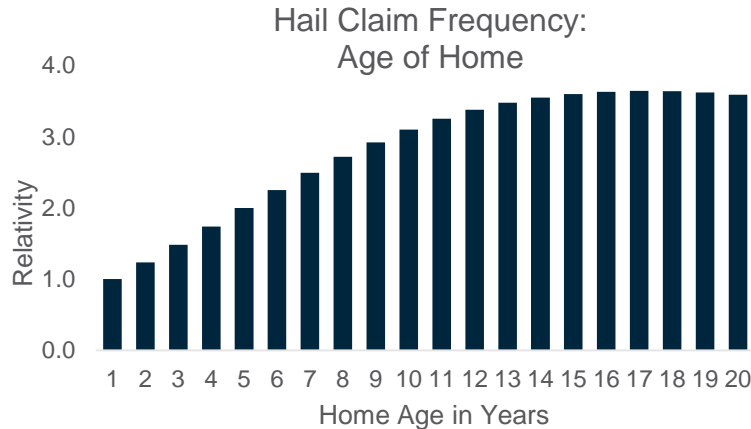
- Gallagher Re research shows hail claim severity outpaced inflation over the past decade
 - Increase in cost of materials, use of independent adjusters, and litigation
- No evidence of an increasing propensity to file a claim
- Impact on losses = **3.75%**



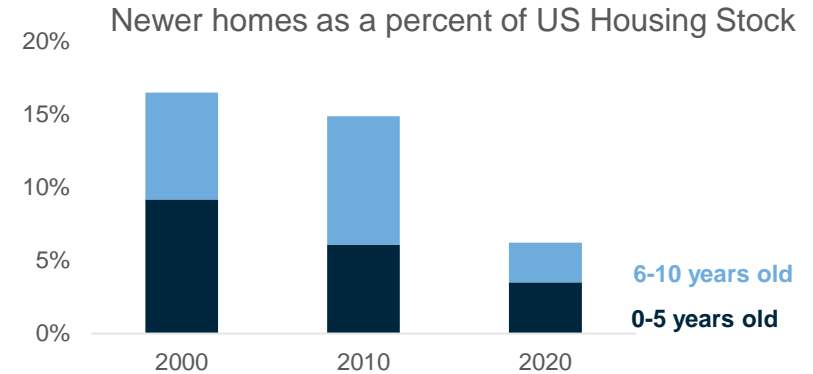
Gallagher Re dataset of 400,000+ hail claims
 Study controls for differences in deductibles, roof characteristics, carrier and state of loss

Aging housing stock contributes to increased SCS claims

- Gallagher Re research shows that older homes are 3.5x as likely to generate a hail claim vs new homes
- US housing starts dropped off significantly after mid-2000s boom and remained low through 2020
- Current housing stock is much older than it was in 2000
- Impact on losses = **1.5%**



Source: Gallagher Re predictive model



Source: US Census - American Community Survey

SCS loss trend: Key findings

- No evidence of increase in countrywide SCS events driven by climate change
- Some evidence of regional hail increases, particularly in TX

Components of 11.5% SCS Trend

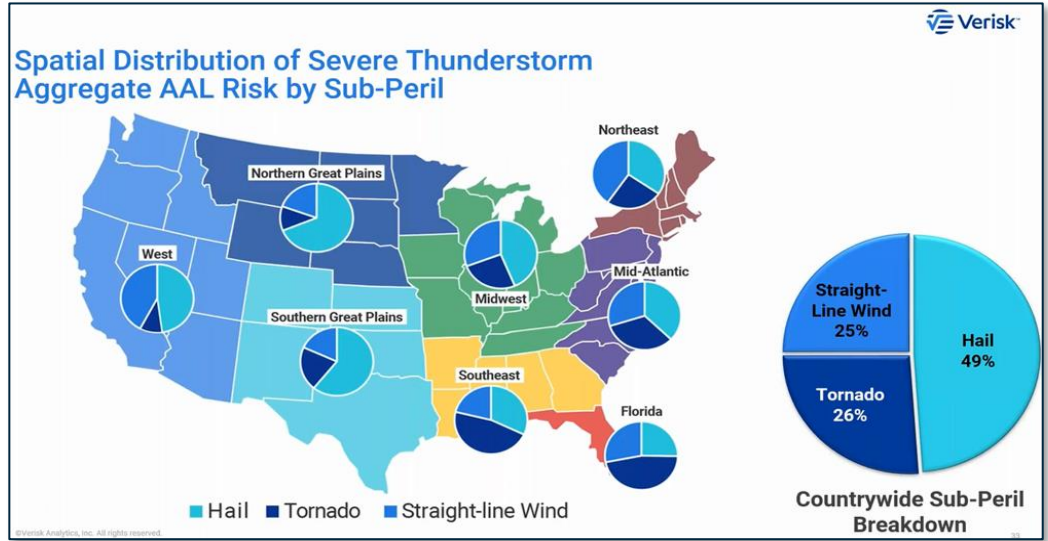


Food for thought: which of these don't relate to understanding an individual company's losses?

For example, urban sprawl explains why there are more PCS losses, but not overall aggregate losses

Establishing a custom view of hail risk is critical to pricing and underwriting SCS

- Recent SCS loss is volatile and increasing
- Vendor models' predictions are out of step with recent experience
- Catastrophe models understate hail frequency
- Hail loss is the largest component of overall SCS loss and highly correlated to the total



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