

Insurability in a Changing Climate

Why reinsurance and resilience
matter more than ever



Introduction

Climate change is affecting extreme weather, a key part of natural catastrophe risk written by the insurance and capital markets. Quantifying the impacts of climate change on insurers' underwriting, risk management and capital strategies is critical for risk-informed decision-making and sustainable growth.

Resilience will play an increasingly important role in the affordability and availability of insurance. Understanding the impact of these factors on reinsurance markets is key for adapting risk-management strategies and embracing a holistic risk-management approach. Guy Carpenter, a Marsh business, has extensive expertise in insurance and reinsurance market dynamics, as well as a variety of solutions for assessing current and future climate risk, including improving risk data quality and modeling resilience measures to help businesses and insurers alike understand and manage extreme weather risk and support longer-term insurability.

What does insurability mean in a reinsurance context?

Insurers accept risk from policyholders in return for a premium, while reinsurers accept risk from insurers, allowing risk to be spread more widely and capital to be used more efficiently. Unlike primary insurance, which is sometimes written within national or regional markets and regulatory frameworks, reinsurance operates as a largely cross-border business, enabling global diversification of risk as reinsurers seek an optimal mix of exposures across geographies, lines of business and perils, where regulation permits.

Both insurers and reinsurers operate within defined risk appetites, which limit how much volatility or loss they are willing or able to absorb. Reinsurance is primarily purchased for managing large "tail" risks—high-severity, low-frequency events, such as extreme weather events, which could severely impact an insurer's bottom line or threaten solvency. It also frees up capital, enabling insurers to write more business and manage volatility over time.

Therefore, insurability in a reinsurance context depends on two conditions. First, reinsurance must be available on terms that align with insurers' and reinsurers' risk appetites. Second, reinsurance must be economically viable for insurers and reinsurers alike: reinsurance premiums must be lower than an insurer's potential income generated by the capital released, while still exceeding reinsurers' expected losses and costs. This means that "tail" risks need to be managed to a level that maintains these conditions.

How does climate change impact tail risks?

The change in frequency or severity of tail risks is key to understanding the impact of climate change on reinsurance. Climate change affects the frequency and severity of these tail risks, therefore impacting weather-related losses. However, reinsurers' losses are not directly affected if losses for a given event remain below insurers' retentions.

[Reinsurers' share of global insured catastrophe losses](#) has averaged around 20% from 2017 to 2022. This declined to approximately 12% between 2023 and 2025, reflecting fewer high-

severity tail events, a shift in risk tolerance following prior loss years, and higher attachment points since January 1, 2023.

With cedents carrying higher reinsurance retentions since the 2023 renewal season, much of the higher-frequency small-to-medium-sized losses have been retained by insurers. In 2025, the California wildfires represented about a third of global insured losses, while severe convective storms accounted for about half. This has driven an increased focus on exposure accumulation management and climate adaptation measures aimed at reducing insurers' surprise losses and concentrations of risk.

For some perils, such as flooding, there is scientific consensus of an overall increase in heavy rain and associated flooding in a warming climate. There is also general agreement on an increase in wildfire weather conditions, for example. However, these impacts are highly regional, and the magnitude of the impacts is uncertain. In addition, changes in building stock — increases in insured values, building deterioration or increased resilience, for example — can have a larger effect than hazard alone, especially over short timescales. Therefore, it is important to understand how risk may change geographically and over time.

These trends do not always translate into higher reinsurance losses and costs, particularly when attritional—small-severity, high-frequency—losses are affected. Before 2023, reinsurance aggregate covers were generally available and offered some protection for these attritional losses. However, reinsurers have tightened terms and conditions since 2023, with primary insurers retaining a greater share of losses. In the current soft market, availability of aggregate covers and reinstatements is returning to some degree, but the main impact of the soft market is a reduction in reinsurance premiums.

How do cyclical factors determine market outcomes?

Reinsurance costs are also affected by cyclical insurance market dynamics, which can vary based on the wider macroeconomic environment. Reinsurance operates as a global market, with capital allocated across regions rather than tied to local markets. Large, correlated losses from low-frequency, high-severity perils, such as hurricanes and earthquakes, have traditionally driven reinsurance cycles due to their severity and impact on capital.

However, high-frequency perils, including severe convective storms, wildfires, and flood, are [occurring more frequently](#) and contributing a growing share of aggregate losses. As the risk profile changes, reinsurance terms may evolve (e.g., changes to coverage, limits, deductibles), which could have implications for insurers' profitability. Typically, when there is a low incidence of large loss events that impact reinsurance layers, there is excess capital in the market, driving down reinsurance prices, which we call a soft market. The opposite is true in a hard market. Reinsurers' investment performance and economic factors can also influence capital availability.

Climate risk does not always show up clearly in these cycles. We are currently experiencing a soft market. In a soft insurance market, the [existing "climate signal"](#)—the change in insurance pricing attributable to weather-related trends—may be "silent," as it is masked by the overall price reductions.

How are insurers and reinsurers responding to climate change impacts?

Guy Carpenter conducts an annual global survey of its brokers on insurers' and reinsurers' sentiments toward climate change. This survey shows that insurers broadly agree that quantifying climate risk is important, but that, on average, around 31% of Guy Carpenter clients globally are actively doing so.

This highlights a gap between perceived importance and action. Reinsurance markets are not advocating for climate-related price increases as much in the softer market. At the same time, regulators are increasingly requiring insurers to quantify their climate risk, as well as to assess and implement risk-management strategies across underwriting, exposure management, capital and risk transfer. In addition, insurers are increasingly scrutinizing their business strategies and monitoring their climate risk to reduce concentrations of risk and surprise losses. Therefore, insurers are motivated to improve climate risk quantification to meet regulatory requirements and tailor their exposure and risk-management strategies.

The insurance industry commonly uses catastrophe models built using historic data. Since insurance is typically placed on a short-term (1-3 year) basis, pricing is revisited at each renewal. However, while pricing adapts to reflect loss experience as it evolves, it is still based fundamentally on a backward-looking view, with catastrophe models typically updated less frequently (every 5-10 years, for example). Catastrophe models are increasingly incorporating historic trends in risk due to climate change up to present day at the time of model release. However, in a rapidly changing climate, it is critical to also consider a forward-looking view for sustainable underwriting and risk management strategies.

How can insurers improve climate risk and resilience quantification?

A clearer understanding of an asset's characteristics and the resilience measures in place [improves the insurer's ability to price risk](#) and, therefore, value resilience. Better catastrophe modeling techniques require improving insurers' exposure data quality and modeling of resilience measures. This enables insurers to better understand the extreme weather risk they are underwriting, while also helping insurers operate profitably. It can also flow through to a more accurate reflection of risk for reinsurance, promoting sustainable insurance and reinsurance.

Changes in insured loss are driven by 3 main factors:

- Changes to hazard, for example, due to climate change.
- Changes in insured values, for example, due to exposure growth and concentration, changing insurance take-up and coverage.
- Changes in exposure characteristics, such as changes to vulnerability or resilience measures, for example, building codes, flood-protection measures, and vegetation management.

Refining the modeling assumptions and techniques for each of these elements helps insurers manage accumulation, identify underwriting opportunities, clarify risk appetite, and support adequate capital management.

Insurers can integrate resilience measures at the individual property level or at the community level into risk modeling. Property-level resilience, such as [wildfire-resistant building material](#), distance to vegetation, or wind-resistant building practices, can be included in some catastrophe models, although uncertainty remains in quantifying impacts and results often rely on engineering judgment since claims data is still emerging for many of these measures.

Reflecting property-level adaptation measures in risk quantification faces several practical challenges. While such measures can lower vulnerability, they can also increase sums insured through higher rebuild or retrofit costs. Verifying that measures are installed and maintained is difficult – particularly for those that depend on activation or behavior, such as alert systems or dry-proofing measures. Consequently, meaningful integration of adaptation into catastrophe models relies on high-quality, granular exposure data and calibrated vulnerability functions, as well as behavioral data. Achieving this will require sustained investment by insurers and clear regulatory incentives with realistic implementation timelines.

- UK Flood Re's Build Back Better scheme¹ – UK households may install flood resilience measures up to the value of £10,000 when repairing their properties after a flood.
(Photo courtesy of UK Flood Re)
- A large Canadian insurer has engaged with a third party on a pilot to provide loss-prevention services for customers threatened by an active wildfire, using measures such as removing fuel and installing temporary sprinkler systems.²



Community-level resilience is more complex to assess, typically requiring bespoke modification of a catastrophe model. However, community-level resilience can be very effective, as evidenced by [Storm Boris in September 2024](#).

In the Czech Republic, 24-hour rainfall exceeded the 100-year return period threshold at many weather stations. Extensive investment in flood defenses and emergency response systems following major floods in 1997, 2002, and 2010 materially reduced losses across the region. These investments reduced a 100+ year rainfall return period to approximately a 1-in-50-year insured loss return period. Another community-level example is [quantifying the insurance benefits of wildfire buffers](#) for Paradise, California, as part of its wildfire recovery measures. This showed that placing a fire buffer—an area of reduced fire fuel that could include areas such as green space or community parklands—along a corridor in Paradise,

¹ [Build Back Better | Property Flood Resilience \(PFR\) Funding | Flood RE](#)

² [Intact Financial Corporation launches... | Intact Financial Corporation](#)

California, could significantly reduce wildfire losses and be as effective at reducing risk as updated fire-resilient building codes.

These improvements to risk data quality and modeling resilience measures not only help insurers, but they also have advantages for businesses, as explored in this [Marsh article](#). Modelling improvements help businesses and insurers alike understand and manage extreme weather risk and support longer-term insurability.

How Guy Carpenter can support insurers

Guy Carpenter is ready to support insurers in developing their analytical capabilities through our suite of [Analytics & Advisory Products](#), including:

- Quantification of risk through probabilistic catastrophe models, both third-party and in-house.
- Model Suitability Analysis® (MSA) provides insight into the appropriateness of these models in today's climate.
- Climate Change Toolkit includes adjustments for changing hazards under future warming scenarios.
- GCAT™ Global Multi-Peril Risk Rating, which provides location-level assessment of risk today and in the future, incorporating hazard and damage into an average annual loss ratio metric. These allow risk to be aggregated to identify hotspots and manage accumulation risk, as well as underwrite and price risk in a changing climate.
- Guy Carpenter monitors the latest developments in science, markets and regulation to provide relevant insights into the industry.

Guy Carpenter has key relationships with reinsurance markets and public bodies, including public-private partnerships (PPP), to connect you to the right partners to help manage your risk.

[Across Marsh](#), we can help insurers and their customers navigate the evolving landscape of climate risk. Follow along as we advance the conversation on insurability and climate through our [partnership with the World Economic Forum](#) over the year.

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