

FIRST STREET: 19TH RISK ASSESSMENT

Global Severe Convective Storm Risk

Pricing Economic Exposure to a Rising Peril

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ABOUT THIS REPORT

This First Street editorial report quantifies where severe convective storm hazards, including hail, damaging thunderstorm wind, and tornadoes, intersect with concentrations of population and economic activity worldwide, and how that exposure is projected to evolve.

Modeled at 12 km resolution under the SSP2-4.5 climate scenario, with implications for underwriting, financing, and valuation.

OVERVIEW

Executive Summary

Severe convective storms (SCS), including hail, damaging straight-line winds, tornadoes, and severe thunderstorms, have become one of the fastest-growing sources of physical climate risk, yet they are still often treated as secondary perils in underwriting. In 2025 alone, SCS generated approximately \$82 billion in global economic losses, accounting for nearly one-third of all natural catastrophe losses worldwide.

The same year marked a major insurance-market inflection point: cumulative insured losses from SCS overtook tropical cyclones, a primary peril, making SCS the costliest insured peril. As carriers reprice this risk through higher premiums, tighter terms, larger deductibles, and reduced availability, more of the financial burden is likely to shift onto asset owners, managers, and investors.

Using First Street's global hazard models, this report quantifies where SCS hazards intersect with concentrations of population and economic activity today, and how that exposure is projected to evolve. First Street finds that nearly half of global GDP is already exposed to frequent hail risk, while almost two-thirds is exposed to frequent damaging SCS winds. On an annualized basis, approximately \$17.8 trillion in GDP is exposed to damaging SCS wind and \$10.6 trillion to

damaging hail each year, with exposure concentrated across major economic corridors. Climate change is projected to intensify exposure in many of today's highest-risk regions, particularly hail in Europe and damaging wind in Asia-Pacific.

These historical losses and forward-looking exposure levels emphasize that SCS should no longer be treated as a secondary peril. Large outbreaks can drive correlated losses across portfolios that appear diversified, triggering substantial capital expenditures, operational disruption, insurance repricing, revenue interruption, and portfolio-level financial risk. For investors, lenders, and insurers, SCS is now a test of whether portfolios are priced for recurring damage, rising insurance friction, and correlated losses that conventional diversification may not absorb.

SCS WIND EXPOSURE • ANNUAL

\$17.8T

in GDP exposed to damaging SCS wind each year.

HAIL EXPOSURE • ANNUAL

\$10.6T

in GDP exposed to damaging hail each year.

SCS WIND GROWTH • 30 YR

+14%

rise in annual SCS wind exposure, to \$20.2T in 30 years.

AT A GLANCE

Key Takeaways

01 Severe convective storms generated more economic losses than any other natural hazard in 2025 and are growing at over twice the rate of other major perils. SCS produced approximately \$82 billion in global economic losses, accounting for nearly one-third of all natural catastrophe losses worldwide. Since 2000, inflation-adjusted SCS losses have grown by roughly 6.8% annually, compared to 2.7% across all natural catastrophes.	02 SCS has become the costliest insured natural peril of the 21st century. Frequent losses across highly insured residential, commercial, industrial, and automotive assets have pushed cumulative insured SCS losses above tropical cyclones, reshaping insurance pricing and availability concerns.
03 Asset-level SCS events can produce near-total losses and prolonged revenue disruption. Across airport terminals, hospitals, solar facilities, agriculture, and industrial storage, case studies show SCS can trigger major repair costs, resilience investments, and business interruption losses that extend beyond the damaged asset to stall revenue, disrupt operations, and impact regional supply chains.	04 One-inch hail already reaches more than half of global GDP on a frequent basis. First Street identifies frequent 1-inch hail exposure across 61.2% of the global population and 51.9% of global GDP, with the potential for damage, recurring claims, and reserve pressures.
05 Annual hail exposure puts \$10.6 trillion in GDP at risk across key global regions. On an annualized exposure basis across modeled likelihoods, \$10.6 trillion in GDP faces 1-inch hail risk today, concentrated in key economic hubs like Texas, rising to \$10.8 trillion in 30 years.	06 The Americas lead current hail exposure, while EMEA is the fastest-growing risk region. More than 11% of GDP in the Americas is exposed to annualized hail risk today, the highest share across regions; however, EMEA is projected to see the fastest growth over the next 30 years, increasing by more than 3%.
07 Frequent and severe SCS winds already reach nearly two-thirds of global GDP. First Street identifies frequent 65 mph SCS wind exposure across 69.5% of the global population and 62.1% of global GDP, enough to damage building components, cause utility outages, generate debris impacts, and interrupt operations.	08 Annual SCS wind exposure is a \$17.8 trillion GDP risk that is growing rapidly. On an annualized exposure basis across modeled likelihoods, \$17.8 trillion in GDP faces 65 mph SCS wind risk today, rising nearly 14% to \$20.2 trillion in 30 years. SCS wind represents a larger exposed economic base than hail and a growing source of business interruption risk for owners, lenders, insurers, and investors.
09 The Americas currently face the largest SCS wind exposure, while APAC represents the fastest-growing risk region. While nearly 14% of GDP in the Americas is exposed to annualized SCS wind risk today, APAC is projected to see the fastest growth over the next 30 years, increasing by more than 18%.	10 SCS should no longer be treated as a secondary peril. Large outbreaks can impair and damage assets, infrastructure, supply chains, and insurance markets simultaneously, creating correlated losses across seemingly diversified holdings. Investors and lenders should price SCS as a recurring performance risk affecting reserves, insurance procurement, resilience CAPEX, loan structure, asset allocation, and valuation.

HISTORICAL CONTEXT

The Growing Cost of Severe Convective Storms

Severe convective storms (SCS) are short-duration but high-impact weather events (including hail, damaging straight-line winds, tornadoes, and severe thunderstorms) generated by intense atmospheric instability. In recent years, SCS has become one of the most financially consequential weather risks in the global economy. Historically, SCS has been treated as a secondary peril because individual events are typically smaller, more localized, and less intensively modeled than primary perils such as tropical cyclones, earthquakes, and floods; however, repeated outbreaks across high-value markets now generate aggregate losses that rival or exceed those headline risks.

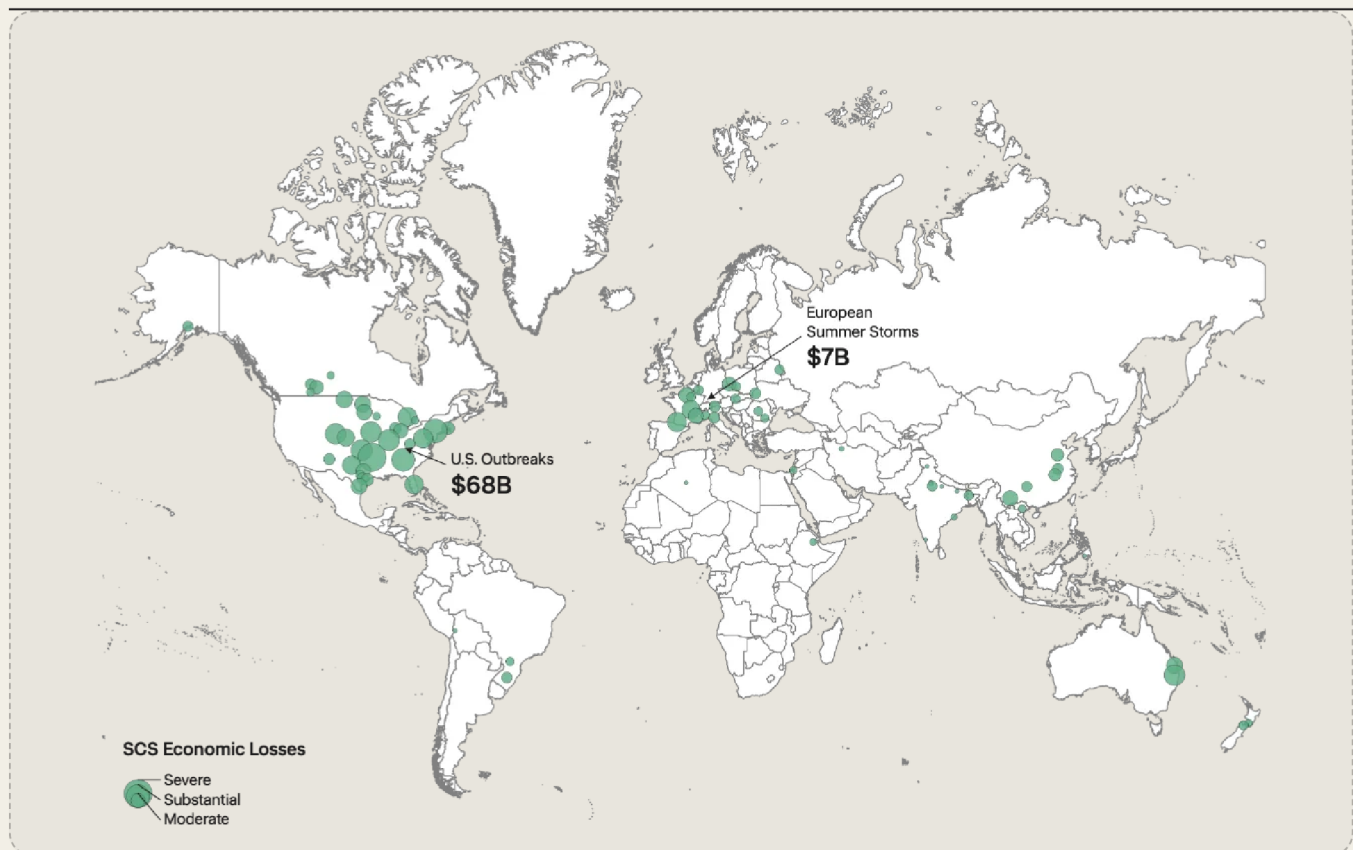


FIGURE 1. NOTABLE SCS LOSS EVENTS 2025

Source: Aon 2026 Climate and Catastrophe Insight

In 2025 alone, SCS generated **\$82 billion** in economic losses, almost a third of total natural catastrophe losses and more than any other peril, with outbreaks concentrated in high-value areas across the United States and Europe (Aon, 2026) (Figure 1).

HISTORICAL CONTEXT

As warming temperatures increase the atmospheric conditions favorable for severe convection, these recurring events are becoming an increasing driver of global catastrophe losses. Unlike hurricanes or earthquakes, which concentrate losses in a small number of catastrophic events, SCS generates recurring losses through frequent hail, wind, and tornado outbreaks. Since 2000, inflation-adjusted SCS losses have grown by approximately 6.8% annually, more than double the growth rate for weather-related losses overall at 2.7%. If this trend continues, SCS is projected to overtake earthquakes to become the world's third-costliest natural hazard within the coming decade after tropical cyclones and flooding (Figure 2).

SCS LOSSES • ANNUAL GROWTH SINCE 2000

6.8%

ALL WEATHER-RELATED LOSSES • ANNUAL GROWTH

2.7%

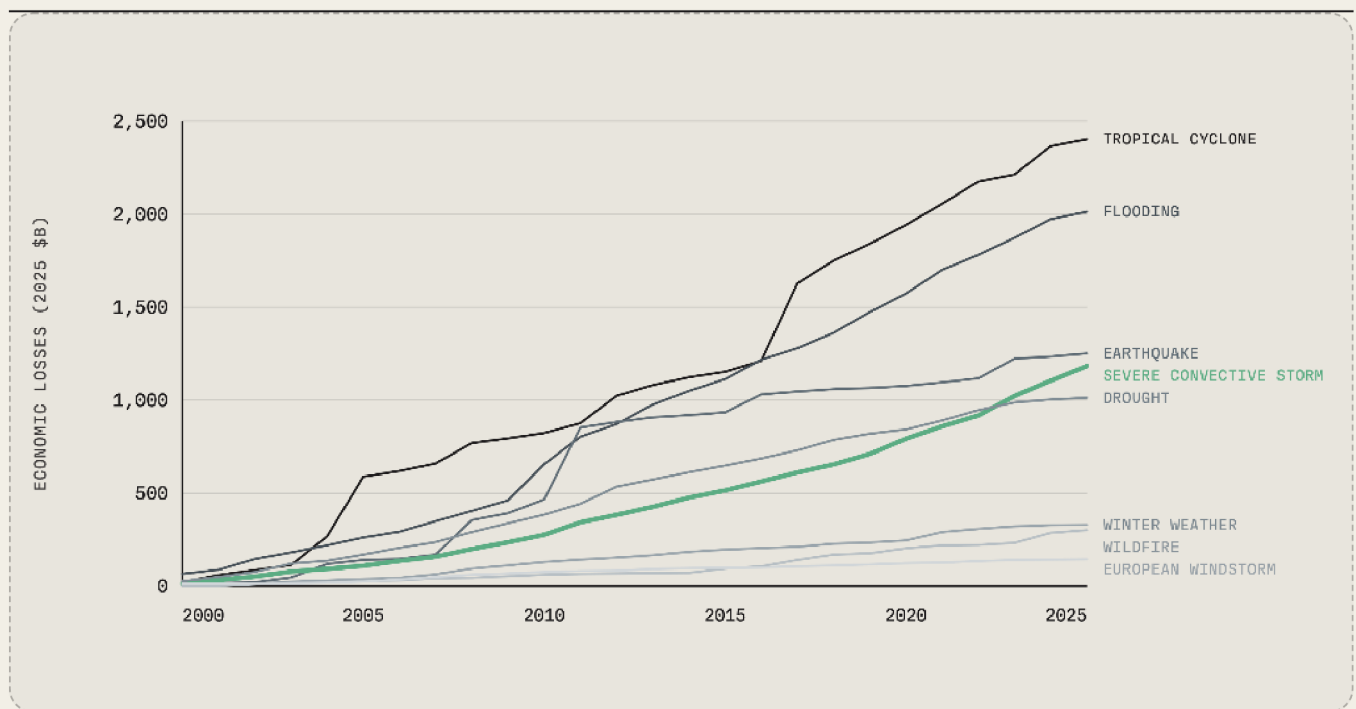


FIGURE 2. CUMULATIVE GLOBAL ECONOMIC LOSSES BY PERIL, 2000 - 2025

Source: Aon 2026 Climate and Catastrophe Insight

HISTORICAL CONTEXT

Most SCS losses occur in densely developed, highly insured regions across North America and Europe, making it one of the defining property insurance perils of the 21st century. Unlike many natural hazards, SCS causes losses that are concentrated in insured residential, commercial, industrial, and automotive assets, leaving insurers to absorb an unusually large share of the economic impact. In 2025, cumulative insured SCS losses surpassed those from tropical cyclones for the first time, signaling a structural shift in catastrophe risk (Figure 3). As insurers respond with higher premiums, larger deductibles, tighter underwriting standards, and, in some markets, reduced coverage, they shift more of the risk onto property owners, lenders, and institutional investors.

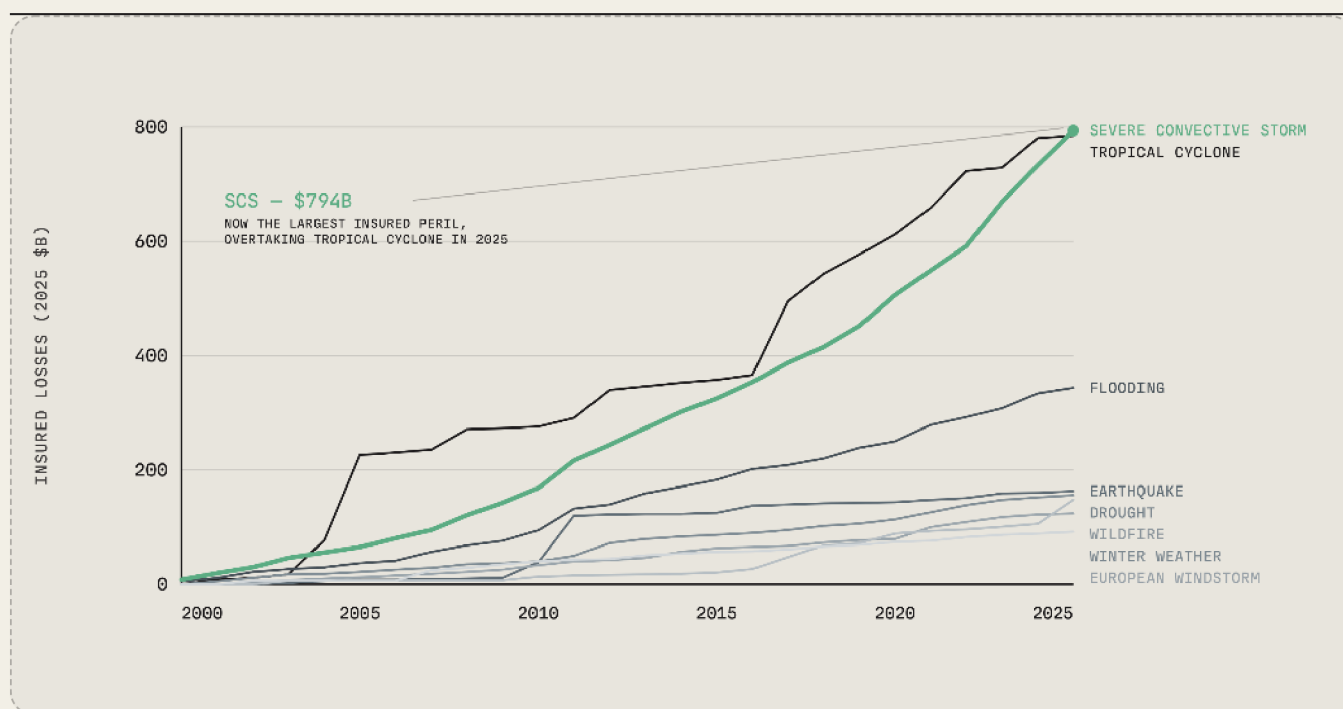


FIGURE 3. CUMULATIVE GLOBAL INSURED LOSSES BY PERIL, 2000 - 2025

Source: Aon 2026 Climate and Catastrophe Insight

Translating SCS Risk into Asset Performance

As insurers increasingly transfer these costs onto asset owners and capital providers, SCS risk is becoming a direct balance-sheet risk. Higher insurance costs, rising capital expenditures, and growing insurability uncertainty are making SCS a material investment consideration alongside hurricanes and wildfires.

An analysis of five historical SCS-driven loss events across representative asset classes demonstrates how SCS can drive near-total losses, major repair and resilience costs, business interruption, and regional supply chain disruption. Each case study pairs historical impact with modeled outcomes from First Street's SCS hazard layers (discussed in "How First Street Measures Global SCS Risk") and damage functions to illustrate how climate risk assessment could have helped asset owners and operators better understand the likelihood and severity of SCS losses.

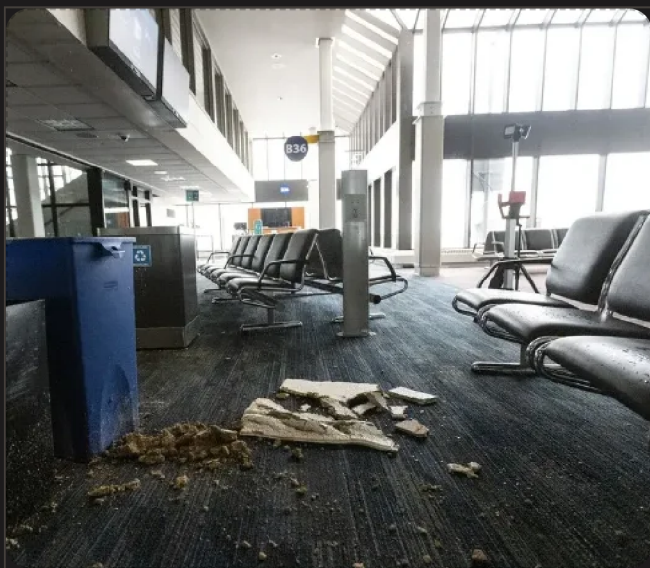
CASE STUDY 01 • AIRPORT TERMINALS

HAIL

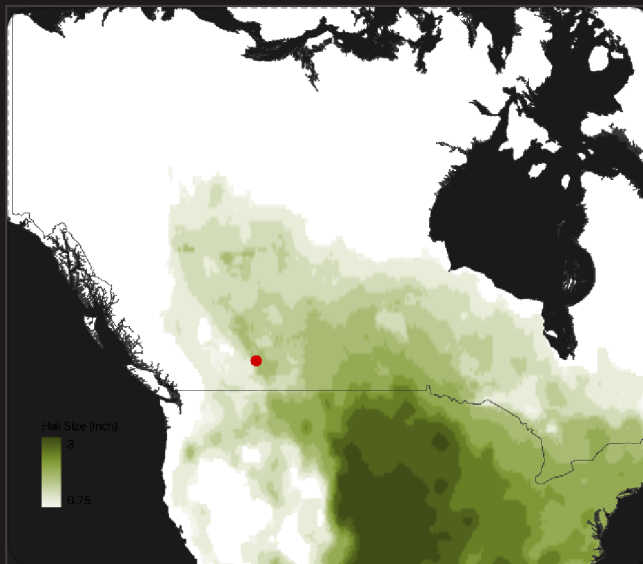
When Hail Turns a Building-Envelope Failure into a Multi-Year Capital Project

YYC CALGARY INTERNATIONAL AIRPORT • CALGARY, CANADA

On August 5, 2024, golf-ball-sized hail punctured the roof over Concourse B at YYC Calgary International Airport, allowing heavy rainfall to enter the terminal and damage interior, mechanical, and electrical systems (YYC, 2024). The terminal closed, and initial airport guidance estimated at least an 18-month closure; this later grew to a multi-year repair with phased reopenings through 2027. YYC reported CAD \$43.5 million in restoration capital in 2024 and another CAD \$80.2 million in 2025, up significantly from the CAD \$36.4 million spent on SCS-related damage in 2023 (YYC Calgary Airport Authority, 2025).



Damage inside Concourse B following the hail event
• Brent Calver / Postmedia



First Street modeled SCS hail hazard with the location of YYC Airport

First Street's hail model illustrates that an event of this severity is not an extreme tail event for this terminal, aligning with roughly a 1% annual likelihood, or about a 26% chance of recurrence over 30 years. The reported 1.75-inch hail corresponds to a nearly 74% chance of roof replacement, amounting to almost \$1.3 million in estimated roof replacement costs alone.

■ FIRST STREET MODELED OUTCOME

~1%

ANNUAL LIKELIHOOD

74%

ROOF-REPLACEMENT CHANCE

\$1.3M

EST. ROOF REPLACEMENT

CASE STUDY 02 • SOLAR FARMS

HAIL

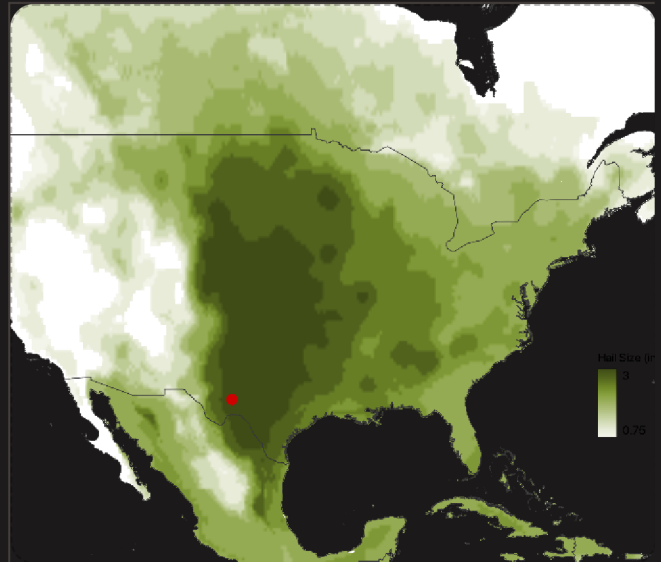
Hail Is Reshaping Insurance for the Solar Industry

MIDWAY SOLAR • PECOS COUNTY, TEXAS, UNITED STATES

In May 2019, a severe hailstorm struck 174 Power Global's 178 MW Midway Solar project in Pecos County, Texas, damaging roughly 400,000 of the facility's 685,000 solar modules (pv magazine, 2021). The damage generated an estimated \$70–80 million insurance claim, one of the largest and most concentrated in the solar sector (JS Held, 2023). Insurers responded by reducing capacity, raising premiums, tightening coverage terms, and imposing new hail limits, significantly increasing solar operating costs (Arthur J. Gallagher, 2024).



Example of a solar farm damaged by hail, Nebraska 2023 • Nebraska Public Power District



First Street modeled SCS hail hazard with a Pecos County solar farm

Using the First Street Enterprise Suite to model a 114-square-mile solar farm near Pecos County indicates an event of this severity has an annual probability of approximately 1%. The reported 2-inch hail would damage nearly half of the site's solar panels, amounting to more than \$18 million in estimated module damage before business interruption, demonstrating that hail can damage the revenue-generating equipment itself.

■ FIRST STREET MODELED OUTCOME

~50%

PANELS DAMAGED (2-IN HAIL)

\$18M+

EST. MODULE DAMAGE

\$70–80M

2019 CLAIM

CASE STUDY 03 • INDUSTRIAL STORAGE

WIND

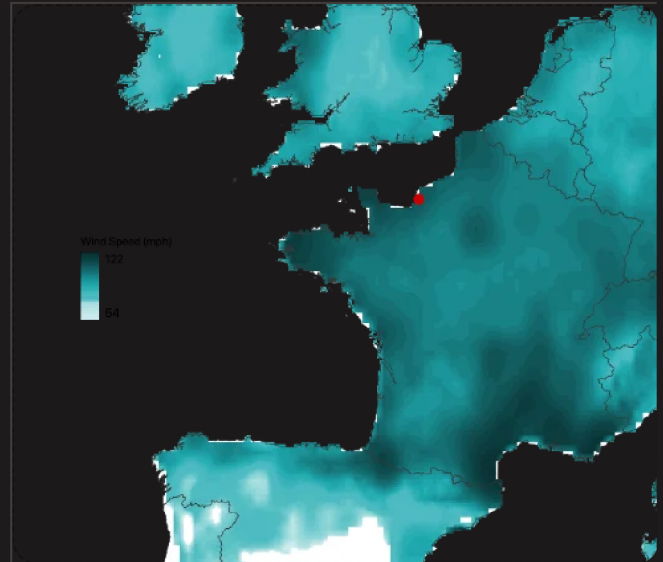
Small Physical Damage Can Trigger Process-Safety Constraints

LPG STORAGE • GONFREVILLE-L'ORCHER, FRANCE

In November 2023, Storm Ciarán damaged a liquefied butane and propane storage facility in Gonfreville-l'Orcher, France, ripping protective weather panels from the dome of a propane tank (ARIA, 2023). The event did not result in a reported tank breach, but it triggered emergency-response measures, site-access restrictions, and nearby road closures, illustrating how wind damage to secondary protective components can still disrupt operations at industrial fuel-storage assets. Ciarán caused an estimated €2.1 billion in insured industry losses across Europe, including €1.8 billion in France (PERILS, 2024).



Example of a storage tank that experienced wind damage



First Street modeled SCS wind hazard with the storage facility, Northern France

Running a comparable storage asset through First Street's wind model indicates that this level of event is rare, aligning with a 0.2% annual likelihood. While modeled damages are limited, the model estimates up to 29 days of business disruption, reinforcing the importance of evaluating operational impacts when wind triggers safety controls, access restrictions, and emergency response.

■ FIRST STREET MODELED OUTCOME

0.2%

ANNUAL LIKELIHOOD

29 days

EST. BUSINESS DISRUPTION

€2.1B

CIARÁN INSURED EU LOSSES

CASE STUDY 04 • HOSPITALS

TORNADO

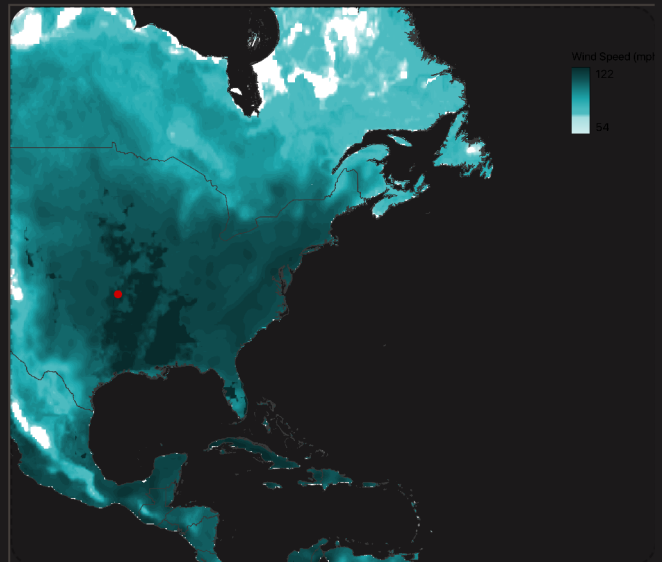
Tornadoes Can Turn Physical Damage into Years of Service Displacement

MERCY HOSPITAL JOPLIN • JOPLIN, MISSOURI, UNITED STATES

An EF5 tornado destroyed Mercy Hospital Joplin (formerly St. John's Regional Medical Center) in May 2011, part of a disaster that caused an estimated \$2.8 billion in total damage across Joplin, Missouri (SFGATE, 2012). Mercy's continuity planning restored business continuity in 88 days at a cost of \$6.6 million (Carlton and Bringle, 2012), and Mercy then invested in a \$465 million replacement hospital, which opened 46 months later with wind-resistant design features (Mercy Hospital, 2026). The permanent asset remained out of service until 2015.



St. John's Regional Medical Center after the tornado, May 24 2011 • Leo 'Jace' Anderson



First Street modeled SCS wind hazard with the location of Mercy Hospital Joplin

Running Mercy Hospital through First Street's wind model reinforces that while tornado-driven building failure is a low-likelihood event, the consequences can be severe: an extreme wind event here corresponds to a 0.2% annual probability, with the potential for more than \$1.2 million in direct damages and over a year of estimated downtime. For hospitals, that downtime is often the greater asset-performance risk.

■ FIRST STREET MODELED OUTCOME

0.2%

ANNUAL PROBABILITY

\$1.2M+

EST. DIRECT DAMAGES

1 yr+

EST. DOWNTIME

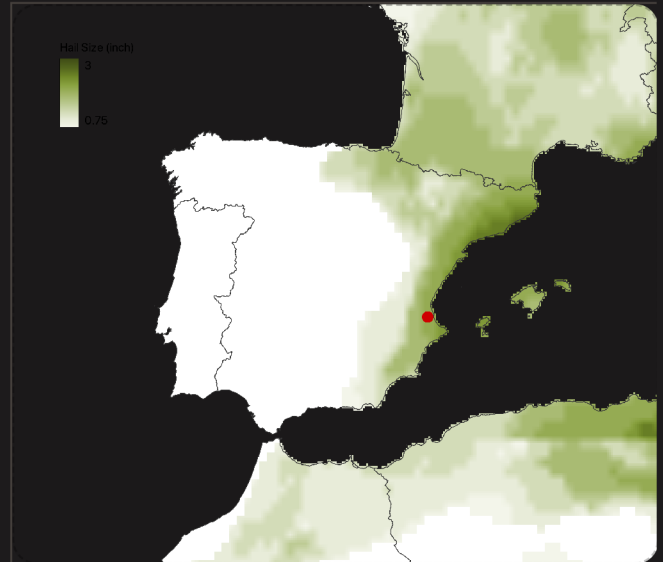
Hail Damages Inventory and Future Yield Potential

PRODUCE FARMS • VALENCIA & CASTELLÓN, SPAIN

Severe hailstorms in September 2023 damaged high-value agricultural land across Valencia and Castellón, with estimates of over 22,000 hectares impacted and €43 million in losses (Fresh Plaza, 2023). Hailstones the size of walnuts, roughly 5 cm and with some reports up to 8 cm, ripped through crops and caused severe field-level damage (European Severe Storms Laboratory, 2023). The storms affected vineyards, citrus, persimmons, avocados, almonds, and olives, with some fields experiencing damage to nearly 100% of the crop, and also created risk for future harvests by damaging the woody structure of vines (AVA-ASAJA, 2023).



Hail damage to a vineyard in Valencia, Spain • Fresh Plaza



First Street modeled SCS hail hazard with the agricultural farm, Valencia

Based on First Street hazard modeling around a citrus farm in the region of Valencia, 2-to-3-inch hail occurs in extreme cases, with roughly a 0.2% annual likelihood, but with substantial crop-loss potential. The results reinforce that hail can convert a short-duration weather event into immediate seasonal revenue loss, with implications for future seasons as recovery depends on crop type.

■ FIRST STREET MODELED OUTCOME

0.2%

ANNUAL LIKELIHOOD

2–3 in

MODELED HAIL SIZE

€43M

ACTUAL 2023 LOSSES

METHODOLOGY

How First Street Measures Global SCS Risk

SCS Hazard Modeling Approach

First Street includes three primary hazards in its definition of severe convective storm (SCS) risk: hail, severe thunderstorm wind, and tornadoes.

First Street models severe convective storm risk using a global hazard framework that combines observed storm activity with atmospheric reanalysis and climate projection datasets. The objective is to estimate the frequency and severity of hail, severe thunderstorm wind, and tornado hazards at a consistent spatial scale across both current and future climate conditions.



FIGURE 4. FIRST STREET SCS MODELING FRAMEWORK

METHODOLOGY

The modeling framework is built on the relationship between severe weather occurrence and the large-scale atmospheric environments that support storm development. Historical observations of hail, damaging winds, and tornadoes are paired with environmental variables such as atmospheric instability, moisture availability, temperature structure, and vertical wind shear. Machine learning techniques are then used to quantify how combinations of these atmospheric ingredients influence the likelihood and severity of severe weather events.

A key advantage of this approach is that it measures the environmental conditions that produce severe weather rather than relying solely on historical loss records or observed event frequencies. This allows hazard estimates to be generated consistently across regions where observational records may be incomplete while preserving the physical relationships that govern severe storm formation.

While severe convective storms share common atmospheric drivers, each hazard is modeled independently to reflect differences in storm dynamics and damage potential.

- 01 **Hail models** estimate annual frequencies across multiple hail-size thresholds, allowing both event frequency and extreme hail size to be assessed through return-period analysis.
- 02 **Severe thunderstorm wind models** estimate the frequency of damaging wind events and associated return-period wind speeds relevant to engineering design standards and infrastructure performance.
- 03 **Tornado models** focus on atmospheric environments associated with rotating severe storms and estimate the probability of localized but high-consequence wind events.

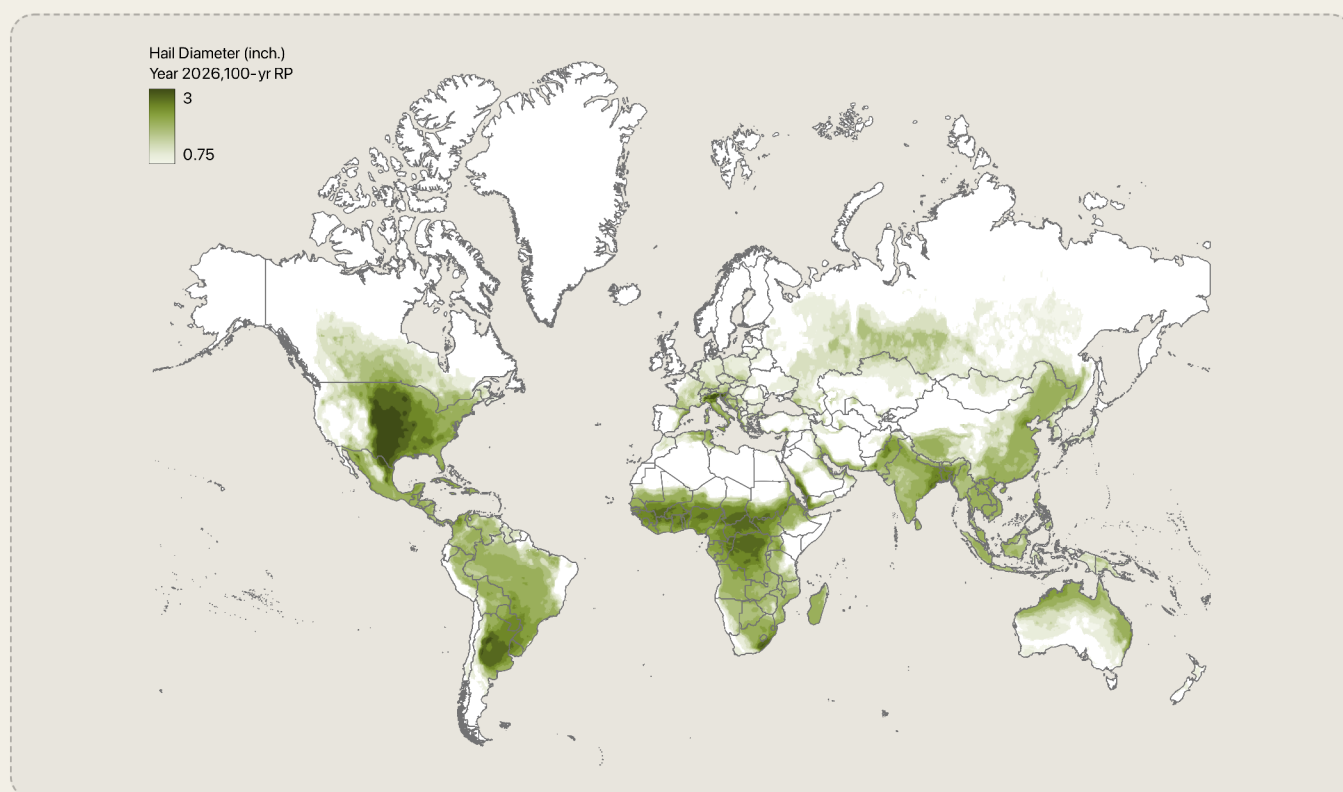


FIGURE 5. MODELED HAIL OUTPUTS, YEAR 2026 AND 100-YR RETURN PERIOD

METHODOLOGY

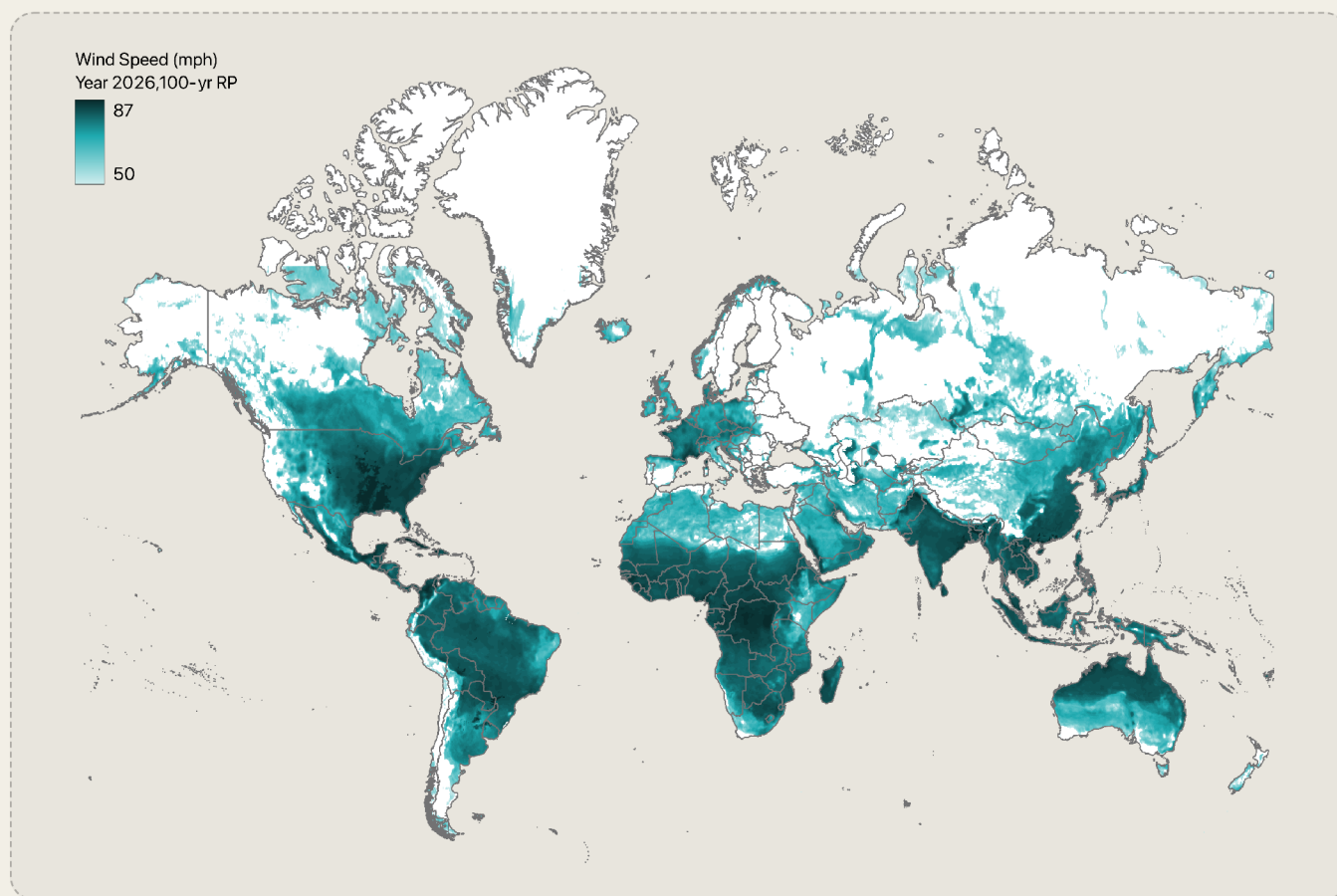


FIGURE 6. MODELED TORNADO AND THUNDERSTORM WIND OUTPUTS, YEAR 2026 AND 100-YR RETURN PERIOD

To evaluate future risk, First Street incorporates climate projections from multiple emissions pathways. Projected changes in temperature and atmospheric conditions are used to estimate how the environments favorable for severe convective storms may evolve through mid-century (2055) and end-of-century (2100) time horizons. This produces climate-adjusted hazard projections that allow for comparison of current exposures with the potential for future risk under different warming scenarios.

The resulting framework provides a globally consistent view of severe convective storm risk for hail, tornadoes, and thunderstorm winds available at the 12-kilometer resolution that can be applied across asset classes, geographies, and investment horizons, supporting both asset-level underwriting and portfolio-level climate risk assessment.

METHODOLOGY

Mapping Hazard to Population and GDP Exposure

To evaluate where SCS risk intersects with concentrations of people and economic activity, First Street combines modeled hazard outputs with gridded population and gross domestic product (GDP) datasets. Population is used as a proxy for human exposure, representing the concentration of residents, workforce, and communities that may be affected by severe weather events. GDP is used as a proxy for economic exposure, representing the spatial concentration of economic activity, productive assets, and potential economic value at risk.

Gridded population and GDP data are derived from baseline 1 km raster files from NASA SEDAC and Wang & Sun (2022). These datasets are then scaled using

national-level UNWPP and IMF projections to reflect estimates for 2025, aligning where people live and where economic activity takes place with modeled SCS hazards across scenarios and years. Both datasets are standardized to the 12-kilometer SCS rasters to enable direct spatial comparison with hazard outputs.

For wind exposure analysis, severe thunderstorm wind and tornado hazards are combined into a single SCS wind metric. For each grid cell, climate scenario, and time horizon, the maximum modeled wind speed across the tornado and severe thunderstorm wind hazard layers is retained to represent the highest potential damaging wind hazard at that location.

SEVERITY THRESHOLDS

Exposure is evaluated against hazard severity thresholds representing increasing levels of potential damage. For hail, thresholds are defined as moderate (≥ 1 inch), major (≥ 1.5 inch), and extreme (≥ 2 inch) diameter. For SCS wind, thresholds are based on damage-relevant wind speeds aligned with Enhanced Fujita (EF) scale intensity ranges, used in defining tornado severity.

HAIL SEVERITY THRESHOLDS

 Moderate	≥ 1 inch
 Major	≥ 1.5 inch
 Extreme	≥ 2 inch

SCS WIND THRESHOLDS (EF-ALIGNED)

 Moderate	≥ 65 mph
 Major	≥ 86 mph
 Extreme	≥ 111 mph

Using results for the middle-of-the-road Shared Socioeconomic Pathway (SSP)-Representative Concentration Pathway (RCP) 2-4.5 climate scenario across time horizons, grid cells exceeding a given hazard threshold are identified, and the population and GDP contained within those cells are aggregated to estimate the total number of people and amount of economic activity exposed to each severity level. Results are summarized to first-order and second-order administrative boundaries (Admin 1 and Admin 2) to support regional comparisons, and are tied to their respective regions across the Americas, Europe, Middle East, and Africa (EMEA), and Asia-Pacific (APAC).

The resulting population and GDP exposures do not represent projected losses. Rather, they quantify the concentration of people and economic activity located within areas exposed to specified levels of SCS severity. To isolate the effect of the changing climate, population and GDP distributions are held constant across all climate scenarios and future time horizons. As a result, changes in exposure reflect only changes in the modeled extent and severity of SCS risk, rather than assumptions about future population growth, economic development, migration, or urbanization. This provides a consistent basis for comparing how climate-driven changes in SCS risk alter potential exposure over time.

METHODOLOGY

Measuring Hazard Frequency and Severity

In addition to severity thresholds, the analysis evaluates exposure across a range of event likelihoods using return periods (RPs). Return periods describe the probability that an event of a given magnitude will occur in any given year, expressed as its annual exceedance probability (AEP). A shorter return period represents a more frequent event, while a longer return period represents a rarer but more extreme event. This report focuses on four return periods:

5-year

20% AEP

Frequent events that are almost certain to occur over an asset's lifetime.

20-year

5% AEP

Relatively frequent events associated with more significant damage potential.

100-year

1% AEP

Relatively rare, tail risk events capable of producing substantial losses.

500-year

0.2% AEP

Rare, high-consequence events that characterize tail risk for areas with any to extreme risk potential.

While return periods illustrate exposure to events of specific magnitudes, First Street also summarizes risk using an Expected Value (EV) metric. EV combines hazard probability with the corresponding exposed population or economic activity across all modeled return periods to estimate the average annual exposure under current or future climate conditions. More frequent events receive greater statistical weight, while rarer, high-severity events contribute proportionally to the overall estimate. This probability-weighted metric provides a single, comparable measure of SCS exposure and is used throughout the report to identify regions facing the greatest overall climate risk.

GLOBAL EXPOSURE

Where Global Exposure Is Concentrated

This analysis of SCS exposure explores the intersection of physical hazard with concentrations of people and economic activity. The following sections examine how exposure varies by hazard, geography, and event frequency, highlighting both the recurring risks that drive annual losses and the lower-probability events that shape long-term catastrophe exposure and portfolio risk.

Global Hail Exposure

Although hail is often perceived as a regional hazard, the analysis shows that damaging hail intersects with a substantial share of the global population and economy when evaluated across multiple return periods. Moderate hail (≥ 1 inch) represents a widespread source of recurring exposure, while larger hailstones become increasingly concentrated but retain the potential to affect major economic centers. This distinction between recurring and tail risk is evident in Table 1. At the 20-year return period, more than half of global GDP (52%) is exposed to moderate hail, increasing to over 82% at the 100-year return period and 97% at the 500-year return period. Even extreme hail (≥ 2 inches), while comparatively rare, has the potential to affect nearly four-fifths of global GDP under increasingly rare but plausible event scenarios. These results demonstrate that hail is not simply a localized hazard, but one with broad implications for long-lived assets and infrastructure globally.

Expected Value (EV) calculations provide a complementary perspective by identifying the extent of recurring annual hail exposure. Approximately \$10.6 trillion in GDP (5.8% of global economic output) is exposed annually to moderate hail, compared with \$3.2 trillion for major hail and \$1.5 trillion for extreme hail. Notably, the 1-inch threshold represents the point at which hail commonly begins to generate property damage and insurance claims. As a result, moderate hail is a major contributor to recurring insured losses, despite producing less severe damage than larger hailstones. While major and extreme hail drive the largest individual loss events, the greater frequency of moderate hail makes it the primary driver of cumulative annual exposure across many property markets.

GLOBAL HAIL EXPOSURE

TABLE 1 HAIL EXPOSURE ACROSS RISK THRESHOLDS AND SCENARIOS

FIRST STREET RISK DESCRIPTION	RETURN PERIOD	POP EXPOSED*	% POP	GDP EXPOSED**	% GDP
MODERATE RISK (1 INCH)					
Almost Certain Risk	5 Year (1 in 5)	1.1 B	14.0%	\$20.1 T	11.1%
Frequent Risk	20 Year (1 in 20)	5.0 B	61.2%	\$94.2 T	51.9%
Substantial Risk	100 Year (1 in 100)	7.1 B	87.1%	\$149.6 T	82.4%
Any Risk	500 Year (1 in 500)	8.1 B	98.5%	\$176.0 T	97.0%
Expected value	—	567.1 M	6.9%	\$10.6 T	5.8%
MAJOR RISK (1.5 INCH)					
Almost Certain Risk	5 Year (1 in 5)	18.6 M	0.2%	\$1.6 T	0.9%
Frequent Risk	20 Year (1 in 20)	1.6 B	20.1%	\$28.0 T	15.4%
Substantial Risk	100 Year (1 in 100)	6.1 B	74.8%	\$118.1 T	65.1%
Any Risk	500 Year (1 in 500)	7.5 B	91.5%	\$158.7 T	87.4%
Expected value	—	162.4 M	2.0%	\$3.2 T	1.8%
EXTREME RISK (2 INCH)					
Almost Certain Risk	5 Year (1 in 5)	—	0.0%	—	0.0%
Frequent Risk	20 Year (1 in 20)	431.4 M	5.3%	\$8.0 T	4.4%
Substantial Risk	100 Year (1 in 100)	4.5 B	54.7%	\$84.4 T	46.5%
Any Risk	500 Year (1 in 500)	6.9 B	84.5%	\$142.6 T	78.6%
Expected value	—	80.2 M	1.0%	\$1.5 T	0.8%

* 2025 estimates given a population of 8.2 billion globally. ** 2025 estimates using purchase power parity (PPP) of roughly \$180 trillion globally. Note: Values presented in millions (M), billions (B), and trillions (T).

GLOBAL HAIL EXPOSURE

An analysis of global hotspots highlights that expected annual hail exposure is driven by the intersection of severe hail climatology with major economic centers (Figure 7). Texas ranks as the single largest concentration of GDP exposed to moderate hail globally, followed by Illinois, Jiangsu, Ohio, West Bengal, Guangdong, North Carolina, Georgia, Shandong, and Dhaka. Together, these jurisdictions illustrate that economically significant hail exposure extends beyond the traditional U.S. "hail alley" into manufacturing and urban centers across Asia as well.

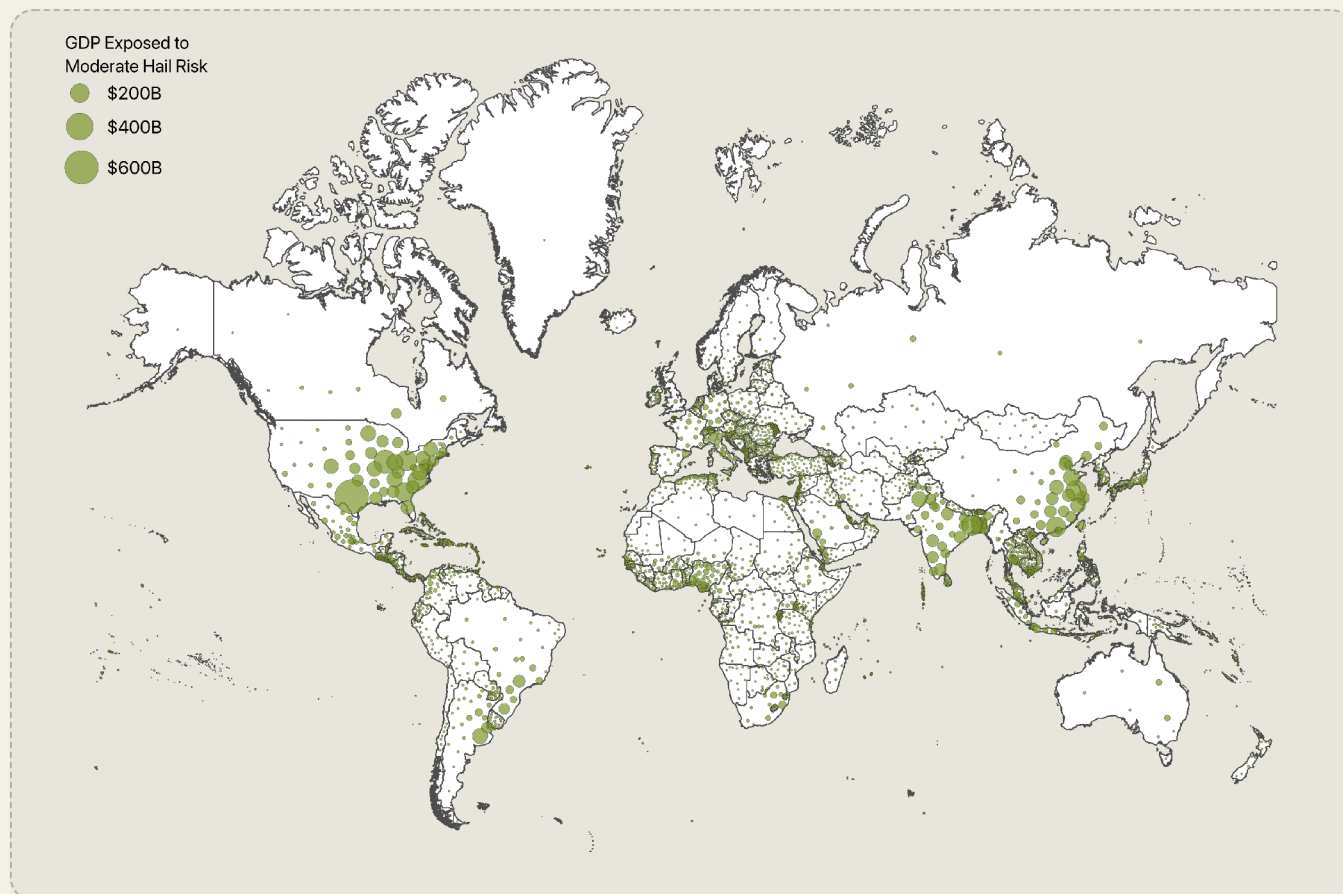


FIGURE 7. HAIL EXPOSURE HOTSPOTS

Note: Applying expected value metrics for moderate hail risk (1 inch or above) today. Analysis at the Admin 1 level.

TABLE 2 TOP 10 GLOBAL LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE HAIL RISK TODAY

#	ADMINISTRATIVE AREA	POP EXPOSED	% POP	GDP EXPOSED (\$ PPP)	% GDP
1	Texas, US	6M	24.4%	\$617.8B	25.1%
2	Illinois, US	3.8M	26.2%	\$302.4B	26.2%
3	Jiangsu, CN	5M	6.2%	\$237.5B	6.2%
4	Ohio, US	3.3M	25.2%	\$233.4B	25.4%
5	West Bengal, IN	26M	24.9%	\$230.3B	24.9%
6	Guangdong, CN	6M	6.1%	\$218B	6.1%
7	North Carolina, US	2.4M	26.0%	\$215.5B	26.0%
8	Georgia, US	2.2M	22.5%	\$206.8B	23.9%
9	Shandong, CN	6.3M	6.2%	\$154.7B	6.2%
10	Dhaka, BD	10.3M	26.2%	\$146.6B	26.2%

GLOBAL HAIL EXPOSURE

Projected changes over the next 30 years reinforce this pattern. Rather than shifting toward entirely new regions, the largest increases occur within today's established hail corridors. Several major cities in the Democratic Republic of the Congo are projected to experience the highest increase in expected GDP exposure, while parts of India, the U.S., among other regions of the Americas and APAC also experience meaningful growth. This suggests climate change primarily intensifies recurring hail risk within existing exposure corridors, increasing the potential for recurring property losses and insurance claims across already vulnerable markets.

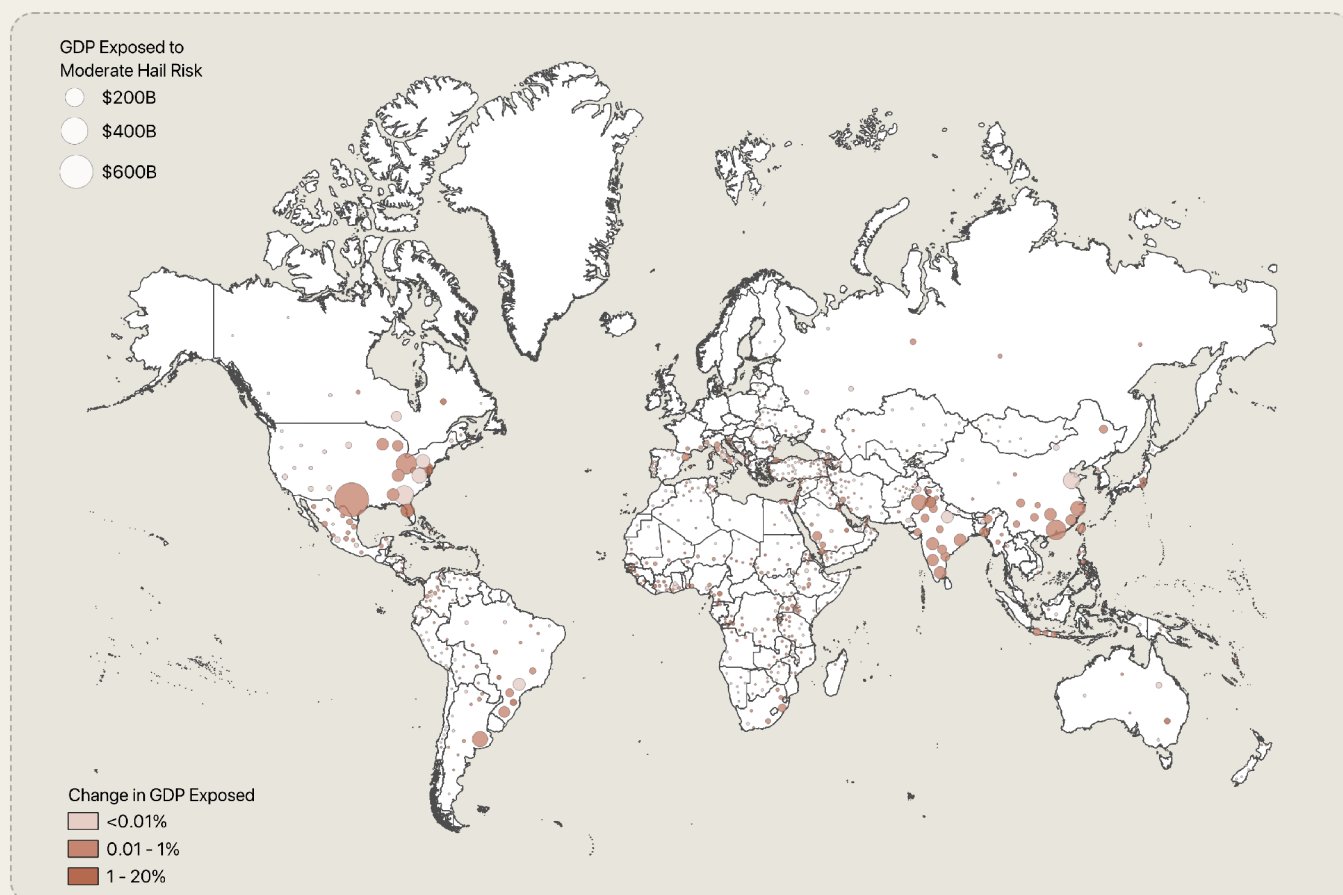


FIGURE 8. GROWTH IN HAIL EXPOSURE ACROSS HOTSPOTS OVER 30 YEARS

Note: Applying expected value metrics for moderate hail risk (1 inch or above) today and in 30 years. Analysis at the Admin 1 level.

TABLE 3 TOP 10 GLOBAL LOCALITIES BY GROWTH IN ANNUAL EXPECTED GDP EXPOSED TO MODERATE HAIL RISK OVER 30 YEARS

#	ADMINISTRATIVE AREA	POP EXPOSED	% POP	GDP EXPOSED	% GDP	GROWTH
1	Kinshasa, CD	500.9K	6.4%	\$2.4B	6.2%	+ 20%
2	Kongo Central, CD	279.4K	5.3%	\$315.4M	4.8%	+ 6.6%
3	Jammu and Kashmir, IN	817.2K	6.8%	\$8B	6.6%	+ 3.2%
4	Maryland, US	1M	16.5%	\$105B	16.9%	+ 3%
5	Santa Catarina, BR	682.2K	11.3%	\$21.1B	10.8%	+ 2.7%
6	Florida, US	1.3M	7.1%	\$101.6B	7.0%	+ 2.5%
7	New South Wales, AU	239.2K	3.1%	\$16B	3.3%	+ 1.9%
8	Punjab, IN	5.5M	16.3%	\$62.3B	15.9%	+ 1.4%
9	Eastern Region, SA	36.8K	0.7%	\$6.1B	2.4%	+ 1.1%
10	Saitama, JP	78.4K	1.2%	\$3.6B	1.2%	+ 1.1%

GLOBAL EXPOSURE

Global Damaging Wind Exposure

When severe thunderstorm wind and tornado hazards are evaluated together, damaging wind emerges as the more geographically extensive severe convective storm hazard. Compared with hail, moderate damaging wind spans a much broader portion of North America, South America, Europe, Africa, and Asia, exposing a larger share of the global population and economy across all return periods. At the 20-year return period, more than 62% of global GDP is exposed to wind speeds of at least 65 mph, increasing to 82.5% at the 100-year return period and nearly 95% at the 500-year return period, demonstrating the widespread footprint of damaging SCS wind.

EV calculations provide a complementary measure of recurring annual exposure. Approximately 907 million people and \$17.8 trillion in GDP are exposed annually to moderate damaging wind (≥ 65 mph), representing 11.1% of the global population and 9.8% of global GDP, roughly 70% greater than moderate hail exposure. The 65 mph threshold corresponds to the National Weather Service definition of a severe thunderstorm and marks the onset of damaging straight-line winds capable of producing roof damage, fallen trees, utility outages, and localized business interruption. Because these events occur frequently across broad regions, they account for the majority of recurring severe convective wind exposure.

Exposure declines sharply as wind intensity increases. The 86 mph and 111 mph thresholds align with increasing damage potential on the Enhanced Fujita (EF) Scale and increasingly capture wind environments associated with tornadoes alongside the strongest straight-line winds. While tornadoes produce the highest wind speeds, they occur less frequently and along comparatively narrow paths, resulting in much smaller exposed footprints. Consequently, expected annual GDP exposure falls from \$17.8 trillion at 65 mph to \$264 billion at 86 mph and just \$46 billion at 111 mph. Together, these results show that severe convective wind presents both a widespread, recurring operational hazard and a localized, high-consequence source of catastrophe risk.

GLOBAL DAMAGING WIND EXPOSURE

TABLE 4 SCS WIND EXPOSURE ACROSS RISK THRESHOLDS AND SCENARIOS

FIRST STREET RISK DESCRIPTION	RETURN PERIOD	POP EXPOSED*	% POP	GDP EXPOSED**	% GDP
MODERATE RISK (65 MPH)					
Almost Certain Risk	5 Year (1 in 5)	2.7 B	32.7%	\$51.5 T	28.4%
Frequent Risk	20 Year (1 in 20)	5.7 B	69.5%	\$112.8 T	62.1%
Substantial Risk	100 Year (1 in 100)	7.1 B	87.1%	\$149.7 T	82.5%
Any Risk	500 Year (1 in 500)	7.9 B	96.7%	\$172.1 T	94.8%
Expected value	—	907.2 M	11.1%	\$17.8 T	9.8%
MAJOR RISK (86 MPH)					
Almost Certain Risk	5 Year (1 in 5)	—	0.0%	—	0.0%
Frequent Risk	20 Year (1 in 20)	—	0.0%	—	0.0%
Substantial Risk	100 Year (1 in 100)	242.3 M	3.0%	\$6.2 T	3.4%
Any Risk	500 Year (1 in 500)	4.8 B	58.6%	\$101.2 T	55.7%
Expected value	—	12.0 M	0.1%	\$264.4 B	0.1%
EXTREME RISK (111 MPH)					
Almost Certain Risk	5 Year (1 in 5)	—	0.0%	—	0.0%
Frequent Risk	20 Year (1 in 20)	—	0.0%	—	0.0%
Substantial Risk	100 Year (1 in 100)	954.1 K	< 0.1%	\$58.0 B	< 0.1%
Any Risk	500 Year (1 in 500)	854.9 M	10.5%	\$22.7 T	12.5%
Expected value	—	1.7 M	< 0.1%	\$46.0 B	< 0.1%

* 2025 estimates given a population of 8.2 billion globally. ** 2025 estimates using purchase power parity (PPP) of roughly \$180 trillion globally. Note: Values presented in millions (M), billions (B), and trillions (T).

GLOBAL DAMAGING WIND EXPOSURE

Wind exposure is concentrated across globally significant manufacturing, logistics, and metropolitan regions throughout East Asia and the eastern United States. Jiangsu, Guangdong, Zhejiang, New York, Taiwan, Fujian, São Paulo, Texas, Illinois, and Pennsylvania represent the largest concentrations of expected annual GDP exposure, highlighting the importance of damaging wind for globally connected supply chains and urban economies.

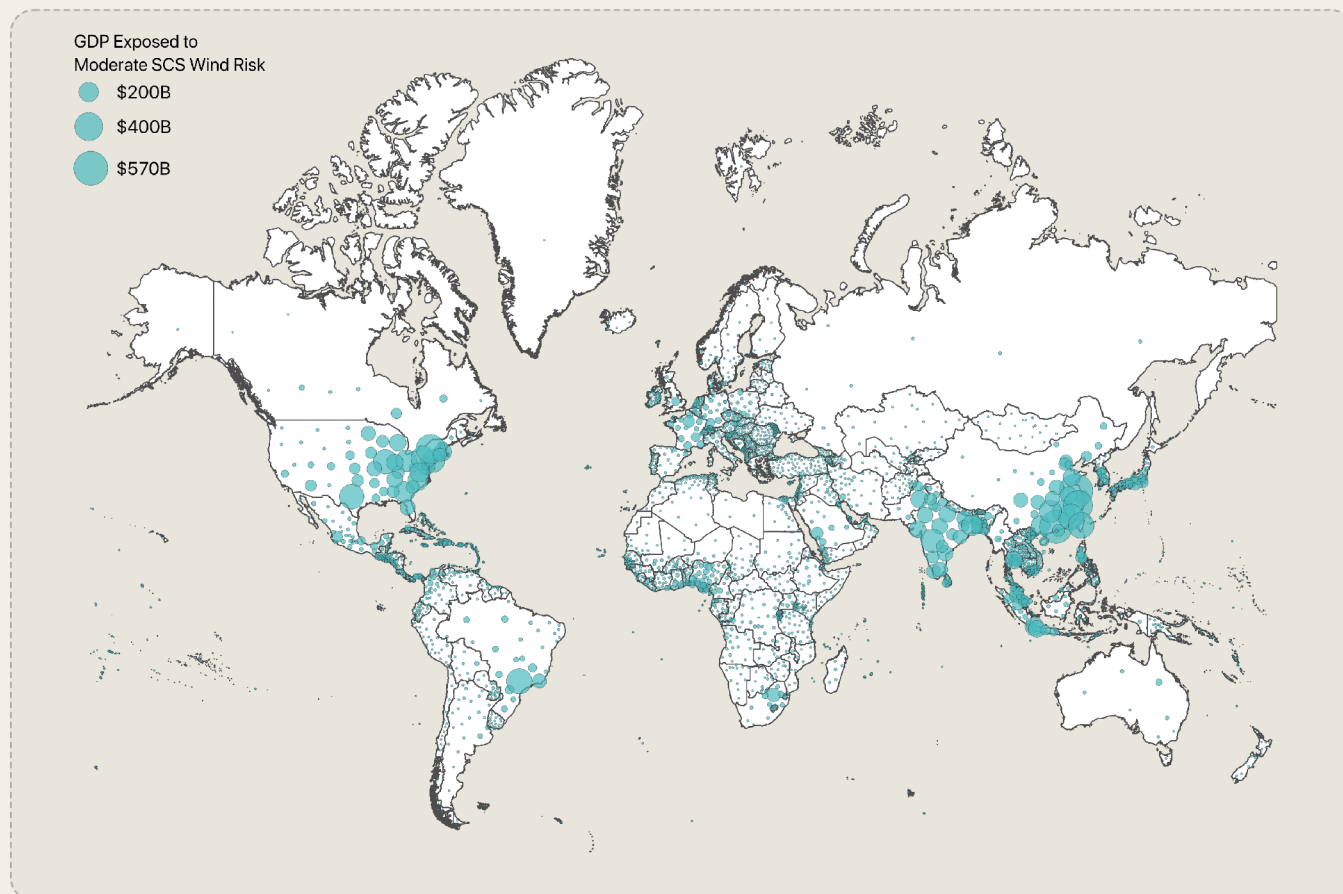


FIGURE 9. SCS WIND EXPOSURE HOTSPOTS

Note: Applying expected value metrics for moderate SCS wind risk (65 mph or above) today. Analysis at the Admin 1 level.

TABLE 5 TOP 10 GLOBAL LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE SCS WIND RISK TODAY

#	ADMINISTRATIVE AREA	POP EXPOSED	% POP	GDP EXPOSED (\$ PPP)	% GDP
1	Jiangsu, CN	12.1M	15.0%	\$571.8B	14.9%
2	Guangdong, CN	15.6M	16.1%	\$538.5B	15.1%
3	Zhejiang, CN	9.8M	21.2%	\$435.9B	21.5%
4	New York, US	4.7M	22.5%	\$428.7B	23.2%
5	Taiwan	3.9M	17.3%	\$340.4B	19.3%
6	Fujian, CN	9M	25.4%	\$334B	25.6%
7	São Paulo, BR	13.6M	25.7%	\$330.4B	25.4%
8	Texas, US	3M	12.3%	\$314.3B	12.8%
9	Illinois, US	3.8M	26.2%	\$302.4B	26.2%
10	Pennsylvania, US	3.8M	26.1%	\$296.3B	26.2%

GLOBAL DAMAGING WIND EXPOSURE

Future projections indicate that many of today's highest-exposure regions also experience the largest increases in recurring wind exposure. Localities across APAC exhibit the highest projected growth, including Osaka and major cities across eastern China, while parts of France, the U.S., among other regions in the Americas and EMEA also rank among the fastest-growing regions globally. These results suggest climate change is amplifying recurring wind risk within established economic centers, in addition to expanding into new geographies.

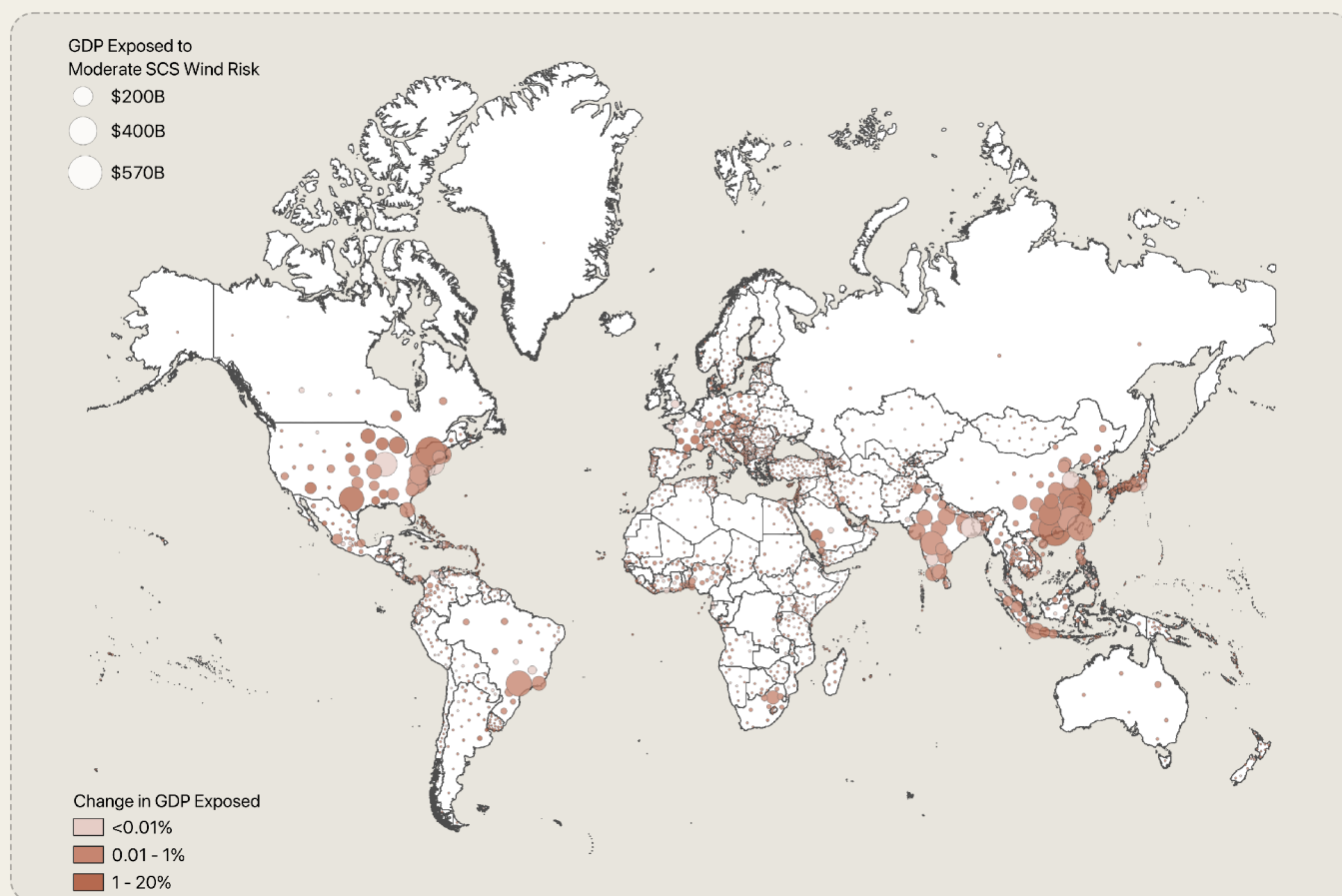


FIGURE 10. GROWTH IN SCS WIND EXPOSURE ACROSS HOTSPOTS OVER 30 YEARS

Note: Applying expected value metrics for moderate SCS wind risk (65 mph or above) today and in 30 years. Analysis at the Admin 1 level.

TABLE 6 TOP 10 GLOBAL LOCALITIES BY GROWTH IN ANNUAL EXPECTED GDP EXPOSED TO MODERATE SCS WIND RISK OVER 30 YEARS

#	ADMINISTRATIVE AREA	POP EXPOSED	% POP	GDP EXPOSED	% GDP	GROWTH
1	Osaka, JP	576.2K	7.8%	\$31.1B	7.0%	+ 19.2%
2	Shanghai, CN	1.4M	7.6%	\$116.3B	7.0%	+ 19%
3	Guangdong, CN	15.6M	16.1%	\$538.5B	15.1%	+ 9.6%
4	Jiangsu, CN	12.1M	15.0%	\$571.8B	14.9%	+ 8.6%
5	Auvergne-Rhône-Alpes, FR	729.5K	9.2%	\$38.4B	8.5%	+ 8.4%
6	Sylhet, BD	1.6M	14.9%	\$12.1B	14.7%	+ 6.9%
7	Hunan, CN	12.4M	17.9%	\$256.1B	16.6%	+ 6.6%
8	Hubei, CN	4.7M	7.5%	\$109.8B	7.3%	+ 6%
9	Arizona, US	823.4K	13.5%	\$65.8B	11.7%	+ 5.4%
10	Buenos Aires, AR	287.4K	1.4%	\$8.1B	1.5%	+ 4.6%

GLOBAL EXPOSURE

Regional Differences

Regional comparisons reveal important differences in both the scale and concentration of severe convective storm exposure. APAC accounts for the largest absolute annual expected exposure, with \$4.3 trillion in GDP exposed to moderate hail and \$10.0 trillion exposed to moderate damaging wind. The region also contains the largest exposed population, reflecting dense urban populations across East and South Asia. Together, these results indicate that APAC represents the world's largest concentration of both economic activity and people exposed to recurring severe convective storm risk.

The Americas exhibit the greatest relative economic exposure, with 11.2% of regional GDP exposed annually to moderate hail and 13.6% exposed to moderate damaging wind, the highest shares of any region. This reflects the combination of extensive severe convective storm climatology and high concentrations of productive assets across the United States, making SCS a particularly significant source of recurring property damage, disruption, and insurance losses relative to the size of the regional economy. By comparison, EMEA currently has the lowest overall exposure, with \$1.4 trillion in GDP exposed annually to moderate hail and \$1.8 trillion exposed to moderate damaging wind. However, its large exposed population highlights the potential humanitarian implications of severe convective storms across key urban areas.

Projected changes over the next 30 years indicate that damaging wind exposure is expected to increase more rapidly than hail exposure across all three regions. Moderate wind exposure is projected to increase by 18.4% in APAC, 14.2% in EMEA, and 5.2% in the Americas, compared with relatively modest increases in moderate hail exposure. Although EMEA begins from a smaller exposure base, it consistently exhibits the fastest percentage growth for higher wind thresholds, indicating that severe convective storm risk may become increasingly material across parts of Europe, the Middle East, and Africa where exposure has historically been more limited.

APAC

\$4.3T

HAIL GDP
EXPOSED

\$10T

WIND GDP
EXPOSED

+18.4%

WIND GROWTH /
30 YR

+1.7%

HAIL GROWTH
/ 30 YR

AMERICAS

\$4.9T

HAIL GDP
EXPOSED

\$6T

WIND GDP
EXPOSED

13.6%

SHARE GDP ·
WIND

11.2%

SHARE GDP ·
HAIL

EMEA

\$1.4T

HAIL GDP
EXPOSED

\$1.8T

WIND GDP
EXPOSED

+14.2%

WIND GROWTH /
30 YR

+3.2%

HAIL GROWTH
/ 30 YR

REGIONAL DIFFERENCES

TABLE 7 REGIONAL ANNUAL EXPECTED HAIL EXPOSURE ACROSS RISK THRESHOLDS

REGION	POP EXPOSED	SHARE POP	GDP EXPOSED	SHARE GDP	GROWTH
MODERATE RISK (1 INCH)					
APAC	281.8M	6.9%	\$4.3T	5.4%	+ 1.7%
Americas	90.1M	9.0%	\$4.9T	11.2%	+ 1.6%
EMEA	147.2M	6.1%	\$1.4T	2.4%	+ 3.2%
MAJOR RISK (1.5 INCH)					
APAC	77.2M	1.9%	\$1.1T	1.4%	+ 4.6%
Americas	27.5M	2.8%	\$1.6T	3.7%	+ 0.9%
EMEA	43.9M	1.8%	\$488.8B	0.8%	+ 5.2%
EXTREME RISK (2 INCH)					
APAC	44.5M	1.1%	\$688.9B	0.9%	+ 4%
Americas	11.7M	1.2%	\$654.6B	1.5%	+ 0.6%
EMEA	17.2M	0.7%	\$187.3B	0.3%	+ 6.7%

TABLE 8 REGIONAL ANNUAL EXPECTED SCS WIND EXPOSURE ACROSS RISK THRESHOLDS

REGION	POP EXPOSED	SHARE POP	GDP EXPOSED	SHARE GDP	GROWTH
MODERATE RISK (65 MPH)					
APAC	542.9M	13.3%	\$10T	12.6%	+ 18.4%
Americas	119.4M	12.0%	\$6T	13.6%	+ 5.2%
EMEA	168.2M	7.0%	\$1.8T	3.2%	+ 14.2%
MAJOR RISK (86 MPH)					
APAC	7.2M	0.2%	\$145.9B	0.2%	+ 26.9%
Americas	1.7M	0.2%	\$85.6B	0.2%	+ 165.9%
EMEA	2.1M	0.1%	\$32.9B	0.1%	+ 133.3%
EXTREME RISK (111 MPH)					
APAC	1.1M	<0.1%	\$16.4B	<0.1%	+ 75.6%
Americas	373.6K	<0.1%	\$27.3B	0.1%	+ 159%
EMEA	82.5K	<0.1%	\$2.3B	<0.1%	+ 496.2%

REGIONAL HOTSPOTS

Americas

The Americas represent one of the world's largest concentrations of severe convective storm exposure, reflecting the overlap of mature economies, high-value and productive insured assets, and some of the most favorable atmospheric environments for hail and damaging wind. This makes the Americas, particularly the U.S., one of the most financially significant SCS markets globally, reflected in its share of overall SCS historical losses.

Hail exposure is concentrated across the central and eastern United States, extending from the traditional Great Plains hail corridor into major metropolitan regions throughout Texas and the Midwest. Harris County (Houston) ranks as the single largest locality by GDP exposed to moderate hail, followed by Cook (Chicago), Dallas, Tarrant (Fort Worth), Bexar (San Antonio), and several other large U.S. metropolitan counties. Together, these jurisdictions illustrate how recurring hail intersects with some of the country's largest concentrations of commercial and industrial assets, increasing the potential for repeated property damage, roof replacement, equipment losses, and insurance claims.

Damaging wind exposure is distributed more broadly across the Americas. While major U.S. metropolitan areas continue to dominate the rankings – including

Cook, Dallas, Maricopa, Wayne, and Franklin – São Paulo also emerges as one of the largest global concentrations of economic exposure to severe convective storm wind. This broader geographic footprint reflects the regional scale of severe thunderstorm outbreaks, which can generate correlated losses across multiple metropolitan areas through property damage, utility disruption, transportation impacts, and business interruption. For investors, lenders, and insurers, the Americas represent a mature but increasingly climate-sensitive severe convective storm market. High concentrations of insured and high-value assets mean SCS exposure translates into material insured losses, operating costs, and capital expenditures.

\$4.9T

MODERATE HAIL GDP EXPOSED / YR

\$6T

MODERATE WIND GDP EXPOSED / YR

13.6%

REGIONAL GDP ÷ MODERATE WIND

AMERICAS REGIONAL HOTSPOTS

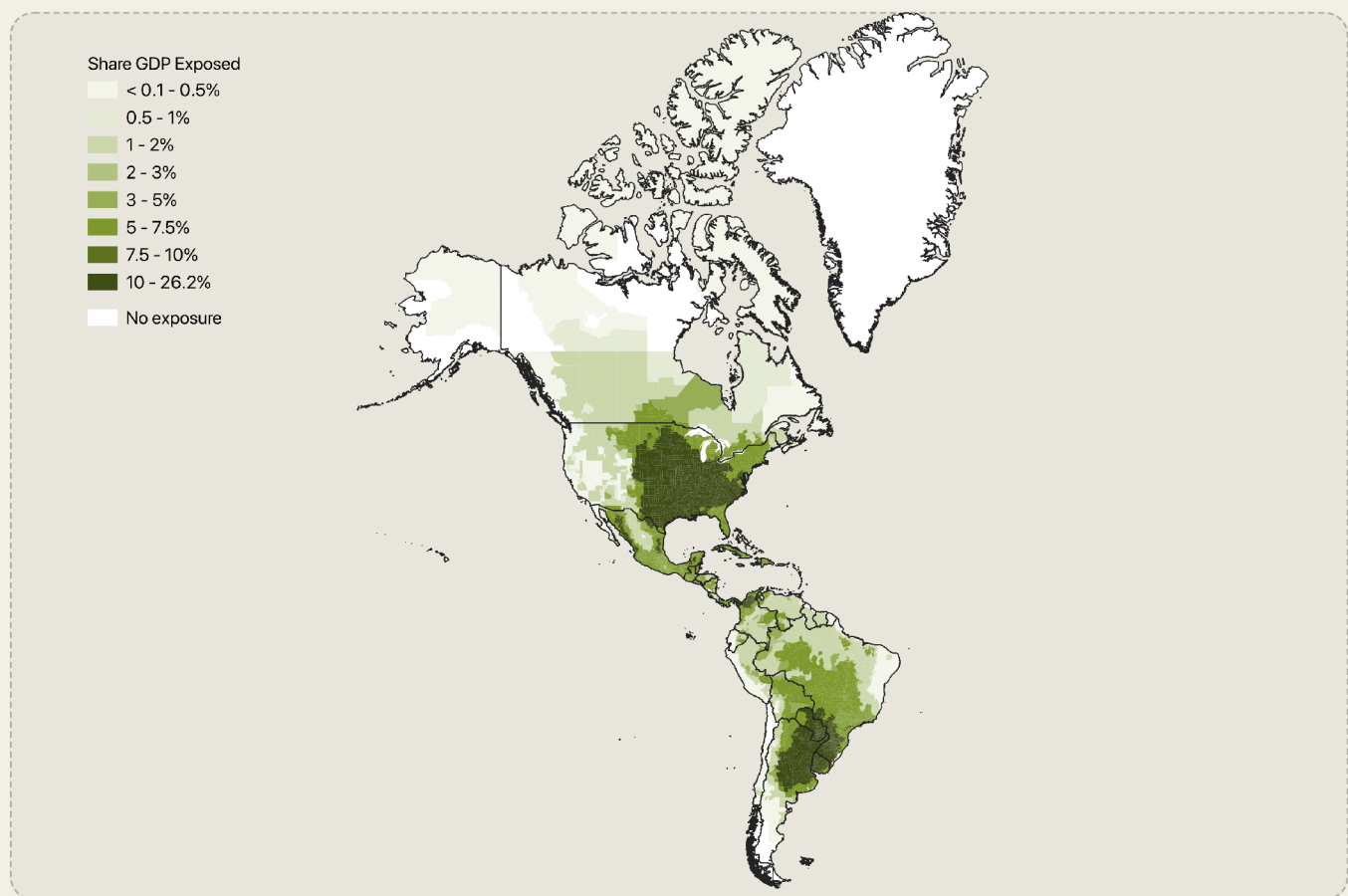


FIGURE 11. AMERICAS ANNUAL EXPECTED HAIL EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate hail risk (1 inch or above) today. Analysis at the Admin 2 level.

TABLE 9 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE HAIL RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Harris, US	\$127.4B	1,067,458
2	Cook, US	\$115.8B	1,620,688
3	Dallas, US	\$85.8B	711,038
4	Tarrant, US	\$49.7B	462,485
5	Bexar, US	\$44.5B	443,441
6	Franklin, US	\$38.8B	327,785
7	Hennepin, US	\$37.8B	350,916
8	Fairfax, US	\$33.8B	322,194
9	Dupage, US	\$30.8B	293,278
10	Travis, US	\$30.4B	261,643

AMERICAS REGIONAL HOTSPOTS

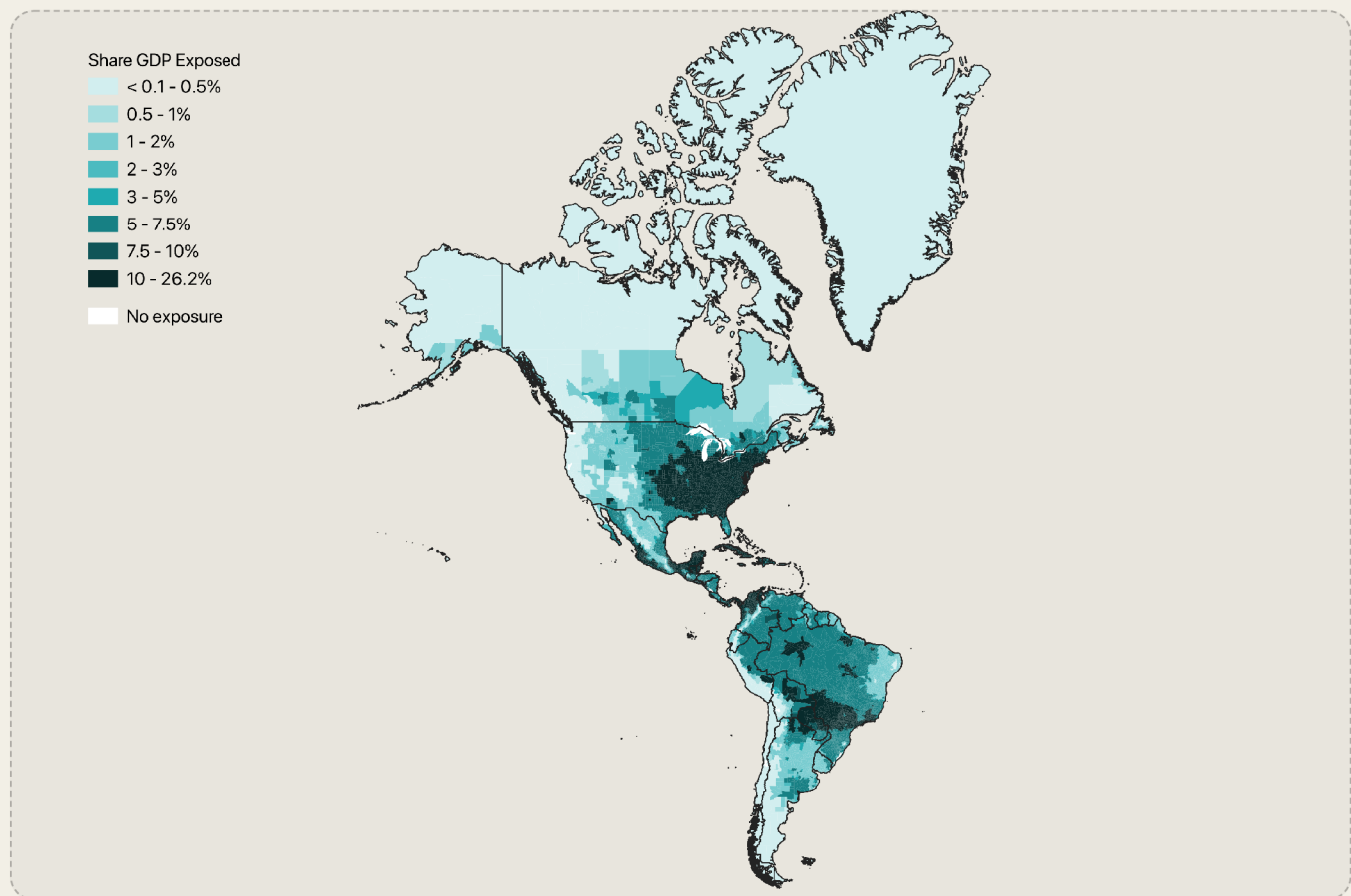


FIGURE 12. AMERICAS ANNUAL EXPECTED SCS WIND EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate SCS wind risk (65 mph or above) today. Analysis at the Admin 2 level.

TABLE 10 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE SCS WIND RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Cook, US	\$115.8B	1,620,688
2	Dallas, US	\$85.8B	711,038
3	São Paulo, BR	\$78.8B	4,234,781
4	Kings, US	\$71.2B	704,365
5	Queens, US	\$65.7B	697,727
6	Maricopa, US	\$57.8B	732,662
7	Tarrant, US	\$49.7B	462,485
8	Middlesex, US	\$43.9B	470,641
9	Wayne, US	\$40.1B	618,371
10	Franklin, US	\$38.8B	327,785

REGIONAL HOTSPOTS

EMEA

Compared with the Americas, SCS exposure across EMEA is more geographically fragmented but spans a diverse range of climatic and economic environments. Exposure is concentrated across southern Europe, portions of western and southern Africa, and selected areas of the Middle East where severe convective environments intersect with rapidly growing urban centers.

Moderate hail exposure is concentrated across Mediterranean Europe and southern Africa, with Barcelona, Milan, Rome, and eThekweni ranking among the region's largest concentrations of exposed GDP. Additional hotspots across Ghana, Burkina Faso, Cameroon, and the United Arab Emirates demonstrate that economically significant hail exposure extends well beyond Europe's traditional storm corridors.

Damaging wind exhibits a broader regional footprint than hail, particularly across southern Africa and the Arabian Peninsula. Johannesburg ranks as the region's largest concentration of GDP exposed to moderate wind, followed by metropolitan areas including Makkah Al Mukarramah, Tshwane, Jiddah, Ekurhuleni, and Paris.

These results highlight the importance of severe convective wind across both established economic centers and rapidly expanding urban regions.

Although EMEA currently accounts for a smaller share of global SCS exposure than the Americas or APAC, regional results indicate comparatively strong projected growth in several hazard categories, particularly for higher wind thresholds. While these increases occur from a relatively small exposure base, they suggest that severe convective storm risk is becoming increasingly relevant across markets where it has historically received less attention in underwriting and investment decision-making, as signaled by recent historical SCS outbreaks in Europe.

\$1.4T

MODERATE HAIL GDP EXPOSED / YR

\$1.8T

MODERATE WIND GDP EXPOSED / YR

+14.2%

WIND GROWTH / 30 YR

EMEA REGIONAL HOTSPOTS

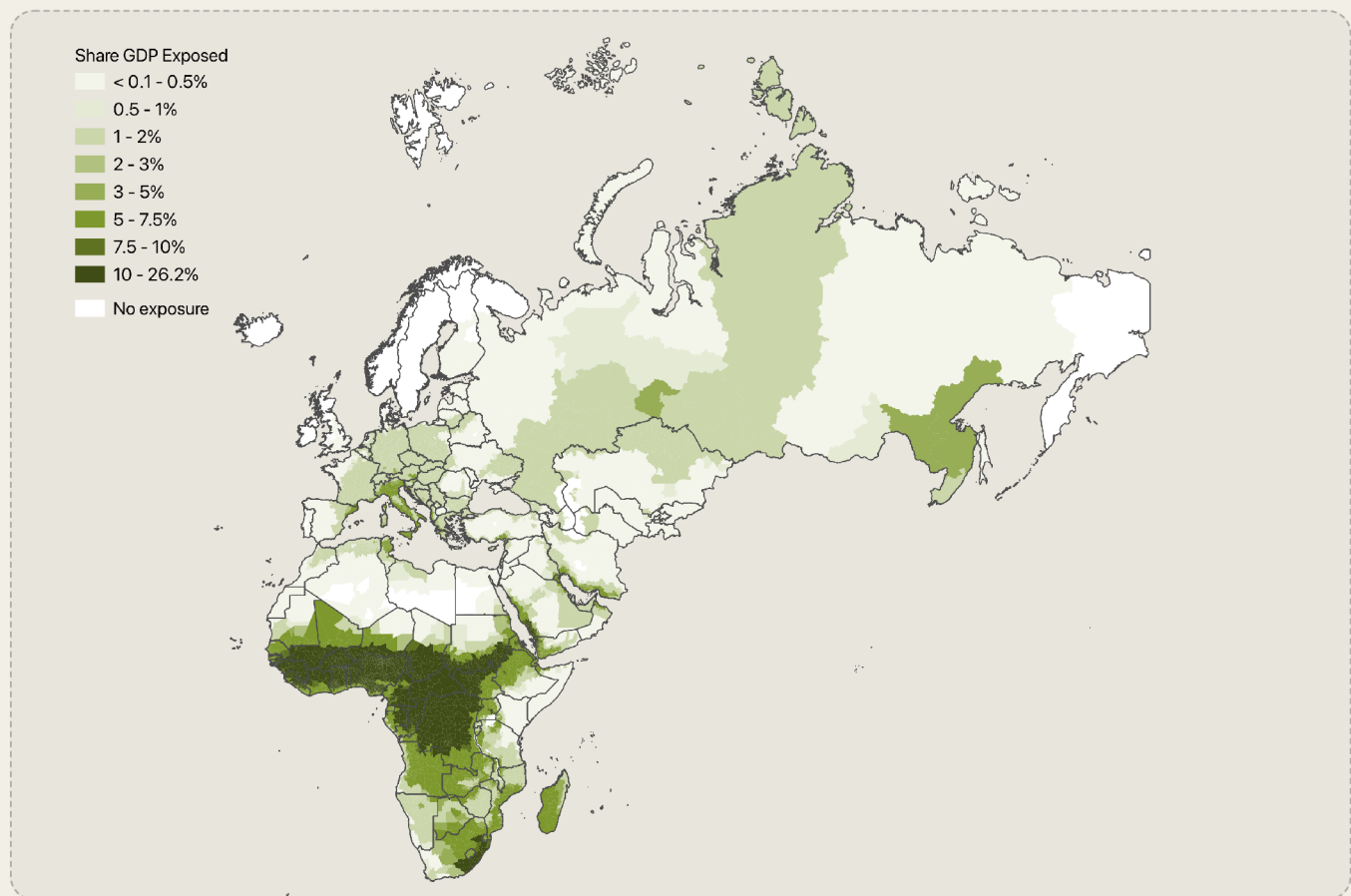


FIGURE 13. EMEA ANNUAL EXPECTED HAIL EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate hail risk (1 inch or above) today. Analysis at the Admin 2 level.

TABLE 11 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE HAIL RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Barcelona, ES	\$24.5B	387,673
2	Milano, IT	\$23B	206,555
3	Roma, IT	\$18.5B	248,385
4	eThekweni, ZA	\$17.8B	966,007
5	Tyumen', RU	\$17B	55,495
6	Kma, GH	\$13.1B	320,323
7	Johannesburg, ZA	\$9.7B	230,217
8	Kadiogo, BF	\$8.6B	460,741
9	UAE	\$7.7B	52,583
10	Mfoundi, CM	\$6.6B	239,725

EMEA REGIONAL HOTSPOTS

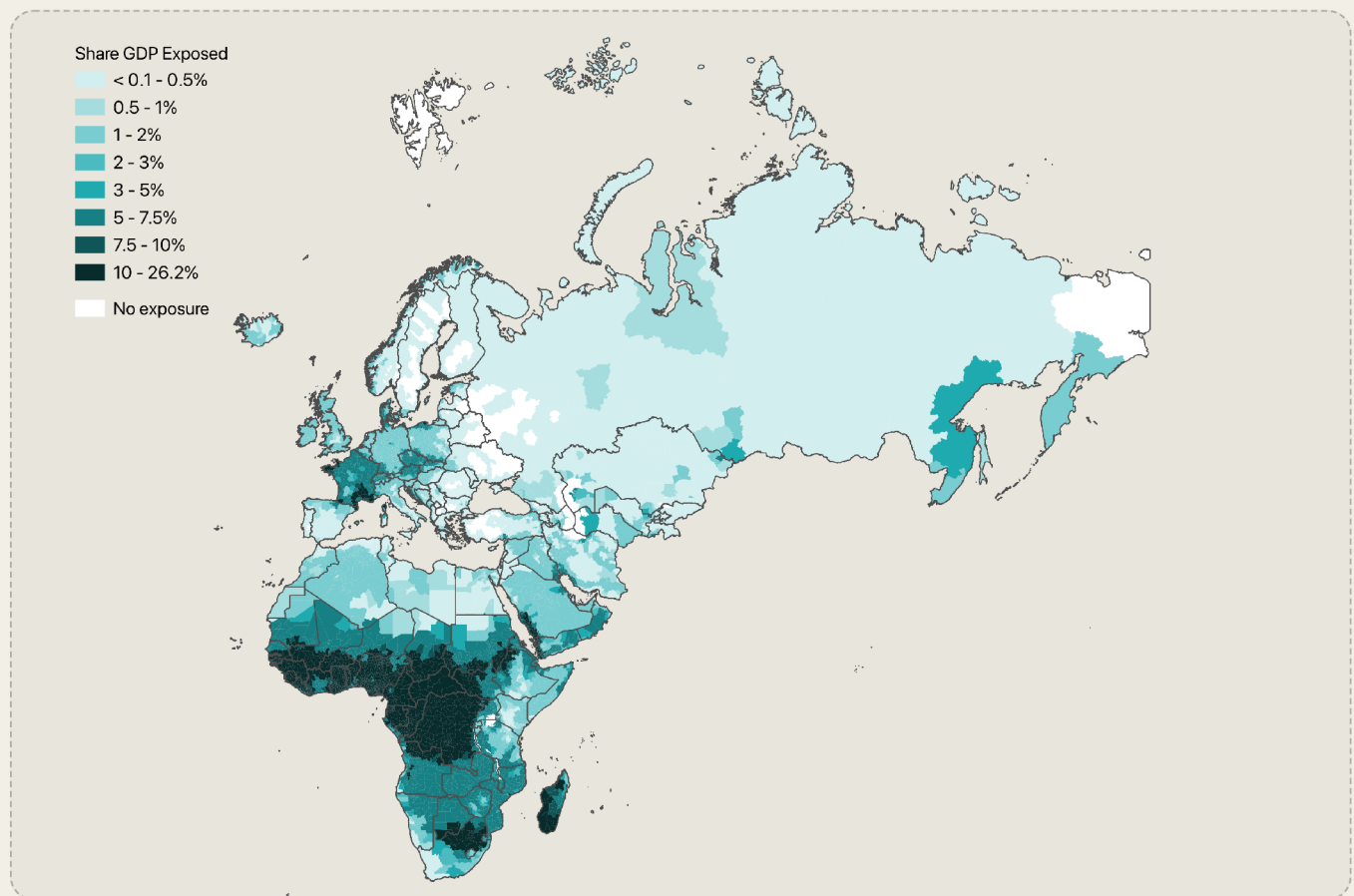


FIGURE 14. EMEA ANNUAL EXPECTED SCS WIND EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate SCS wind risk (65 mph or above) today. Analysis at the Admin 2 level.

TABLE 12 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE SCS WIND RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Johannesburg, ZA	\$32.4B	972,853
2	Makkah Al Mukarramah, SA	\$28.6B	37,809
3	Tshwane, ZA	\$23.8B	652,509
4	Jiddah, SA	\$22.9B	16,459
5	Ekurhuleni, ZA	\$22.2B	751,232
6	Paris, FR	\$19.2B	154,932
7	Al Taif, SA	\$14.9B	166,950
8	Hauts-De-Seine, FR	\$14.1B	117,163
9	Abidjan, CI	\$11.8B	565,472
10	Ar Riyad, SA	\$10.8B	2,337

REGIONAL HOTSPOTS

APAC

The Asia-Pacific region represents the largest concentration of severe convective storm exposure globally in absolute terms, driven by the combination of favorable severe weather environments, dense population centers, and some of the world's fastest-growing economic regions. Across both hail and damaging wind, APAC contains the greatest total exposed GDP across hail and wind combined, and the largest wind exposure of any region, underscoring the region's importance for global manufacturing, trade, and supply chain resilience.

Hail exposure is concentrated across eastern China, Bangladesh, and parts of northern India. Shanghai, Beijing, Suzhou, Tianjin, Shenzhen, Guangzhou, Wuhan, and Dhaka all rank among the largest economic centers exposed to recurring moderate hail, reflecting the intersection of severe storm climatology with rapidly urbanizing and industrialized regions.

Wind exposure is even more pronounced. Taiwan represents the single largest concentration of GDP exposed to moderate severe convective storm wind within the region, followed by Shanghai, Chongqing, Beijing, Suzhou, Fuzhou, Hangzhou, Singapore, Hong

Kong, and Quanzhou. Many of these jurisdictions serve as globally significant manufacturing, logistics, technology, and financial hubs, increasing the potential for severe convective storms to generate correlated disruptions across international supply chains and capital markets.

Substantial projected growth in SCS exposure across APAC over the coming decades, indicates that the region is likely to remain one of the most consequential regions globally for SCS risk, with growing implications for insurance availability, infrastructure resilience, asset valuation, and institutional portfolio construction.

\$4.3T

MODERATE HAIL GDP EXPOSED / YR

\$10T

MODERATE WIND GDP EXPOSED / YR

+18.4%

WIND GROWTH / 30 YR

APAC REGIONAL HOTSPOTS

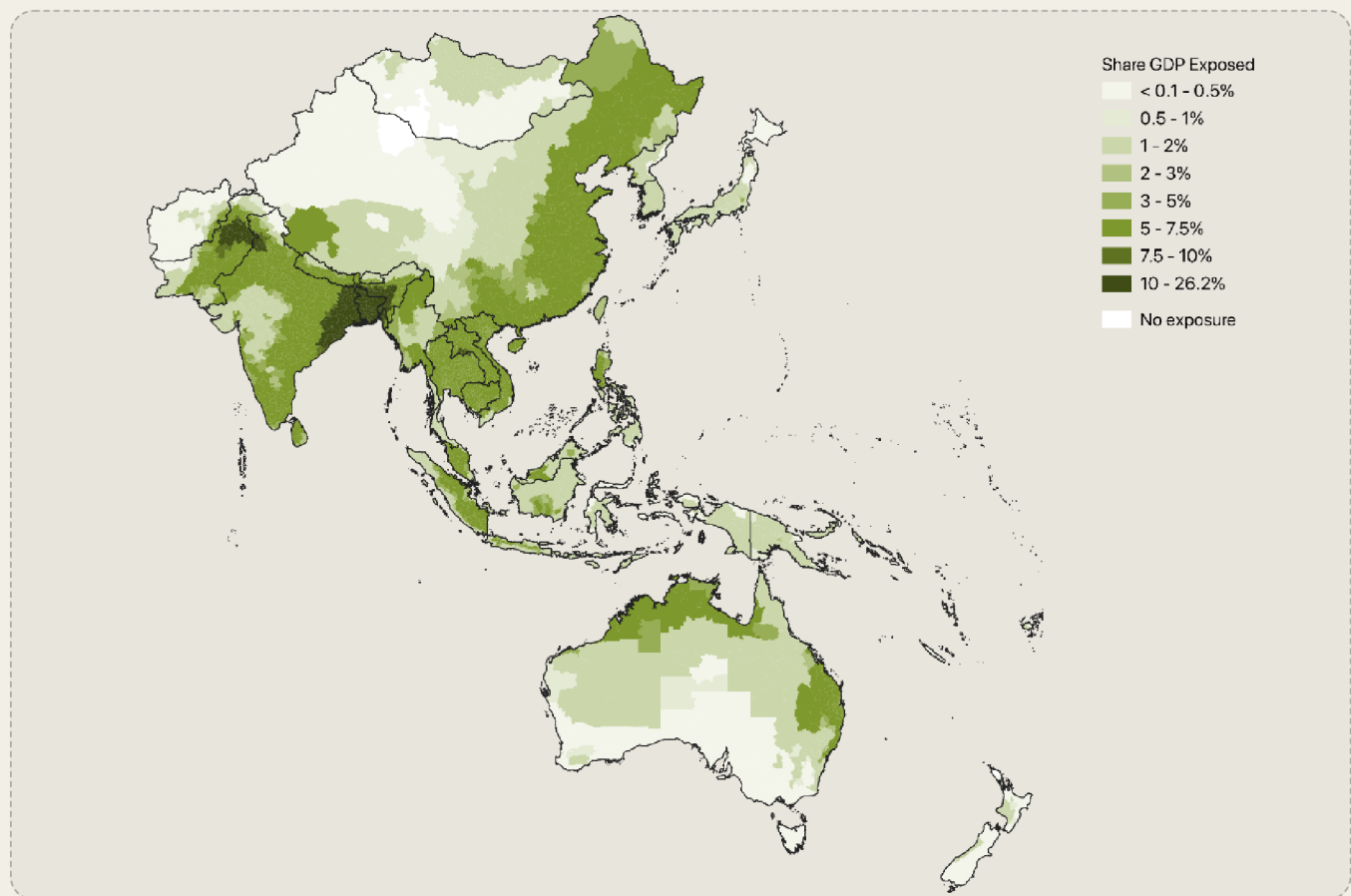


FIGURE 15. APAC ANNUAL EXPECTED HAIL EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate hail risk (1 inch or above) today. Analysis at the Admin 2 level.

TABLE 13 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE HAIL RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Shanghai, CN	\$103.1B	1,164,700
2	Beijing, CN	\$84.2B	1,148,243
3	Dhaka, BD	\$66.2B	2,721,022
4	Suzhou, CN	\$43.7B	444,802
5	Taiwan	\$43.6B	529,828
6	Tianjin, CN	\$34.3B	744,571
7	Shenzhen, CN	\$32.3B	439,985
8	Guangzhou, CN	\$32.2B	818,452
9	North Twenty-Four Parganas, IN	\$27.8B	2,855,564
10	Wuhan, CN	\$26.8B	503,635

APAC REGIONAL HOTSPOTS

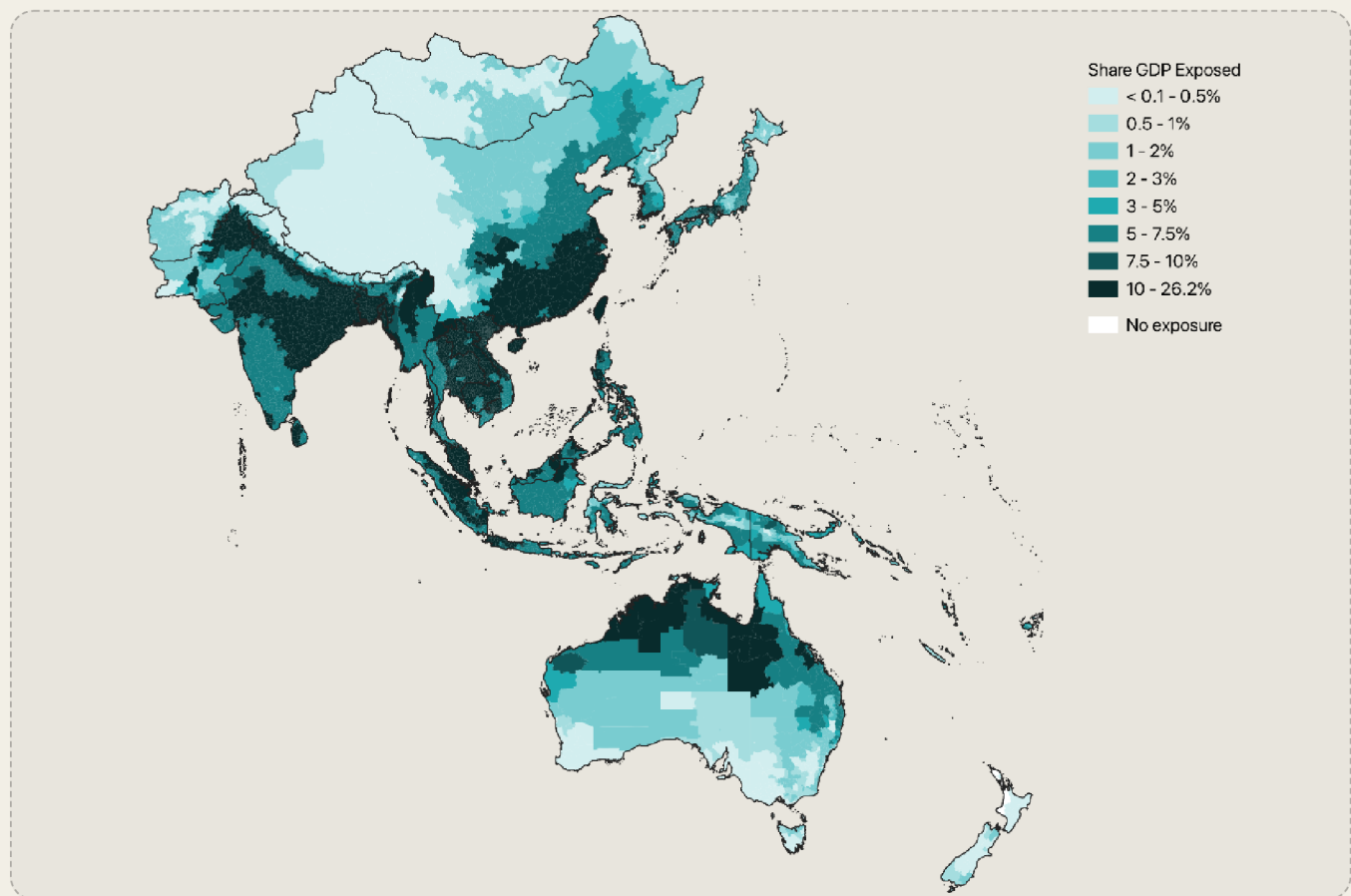


FIGURE 16. APAC ANNUAL EXPECTED SCS WIND EXPOSURE SHARE OF GDP

Note: Applying expected value metrics for moderate SCS wind risk (65 mph or above) today. Analysis at the Admin 2 level.

TABLE 14 TOP 10 LOCALITIES BY ANNUAL EXPECTED GDP EXPOSED TO MODERATE SCS WIND RISK TODAY

#	ADMIN AREA	GDP EXPOSED (\$ PPP)	POP EXPOSED (2025)
1	Taiwan	\$340.4B	3,880,890
2	Shanghai, CN	\$116.3B	1,429,758
3	Chongqing, CN	\$100.8B	3,356,283
4	Beijing, CN	\$83.8B	1,143,357
5	Suzhou, CN	\$82.6B	1,095,200
6	Fuzhou, CN	\$81.9B	1,708,891
7	Hangzhou, CN	\$78.5B	1,727,155
8	Singapore	\$76.5B	201,814
9	Hong Kong	\$75B	1,034,564
10	Quanzhou, CN	\$74.2B	1,924,035

CONCLUSION

From Secondary Peril to Portfolio-Level Risk

Severe convective storms have become a material driver of physical climate risk for the built environment. First Street's analysis demonstrates that recurring hail, severe thunderstorm wind, and tornadoes already expose a substantial share of the global population and economy to annual risk, with climate change projected to increase exposure across major regions.

For insurers, lenders, investors, and asset owners, this shift has implications across the investment lifecycle. Rising SCS exposure is likely to affect insurance cost, availability, and procurement strategy; capital and reserve requirements; asset allocation; loan structuring; and stress testing as recurring physical risk becomes more material to long-term asset performance. By combining physically based hazard modeling with globally consistent measures of population and

economic exposure, First Street's analysis provides a clearer view of where risk is concentrated today and how it is expected to evolve under future climate conditions.

Incorporating SCS into asset- and portfolio-level due diligence can improve assumptions around insurance, operating expenses, repair and resilience CAPEX, revenue continuity, loan terms, and valuation.

The underwriting implication is clear. SCS should no longer be treated as a secondary peril, but as a recurring and correlated risk capable of reshaping asset performance and portfolio outcomes.