

Weathering The Storm: Hedging Climate Risk

August 31, 2026

Key Takeaways:

- **A steadily rising bill.** U.S. weather and climate disasters have trended from roughly \$30-50 billion in annual damage in the early 2000s to well over \$150 billion in recent years, with 2026 on pace to land in that upper range; the increase reflects both more frequent severe events and more value concentrated in exposed areas.
- **Calibration at scale is the basis for genuine price discovery.** Across roughly 70,000 to 73,000 resolved daily weather markets per horizon, prices track realized outcomes closely at every stage tested, a 70-cent contract resolves "yes" close to 70% of the time. That consistency, sustained across tens of thousands of observations, is what distinguishes a continuously repriced market signal from a static point estimate, and it is the basis on which these prices can be used for hedging or reference purposes with confidence.
- **The hedging use case is real and structurally underused.** Exchange-traded, city/day-level contracts with low minimum size open weather hedging to businesses that the traditional OTC market, built for large, sophisticated counterparties, was never designed to serve. Small businesses are paying attention.

What Climate Markets Address

Weather is a recurring, well-documented source of economic variability. Academic estimates cited in industry literature associate a one standard-deviation increase in rainfall with roughly a 0.17% reduction in local income, a cool summer with a 0.25% reduction, and a cold winter with a 0.1% reduction. More severe events, such as droughts, have been associated with GDP declines of up to 2% in affected regions. Cumulative losses from weather-related extreme events over the past decade have been estimated near \$2 trillion, with some projections placing future losses in the tens of trillions of dollars over coming decades. These are third-party estimates that depend heavily on assumptions about emissions paths, adaptation, and measurement methodology, and should be read as indicative orders of magnitude rather than precise figures.

For context, traditional weather derivatives have existed in over-the-counter form since the late 1990s and have been estimated at roughly \$25 billion in annual notional volume, though as an unregulated, bilaterally negotiated market, comprehensive volume data are not publicly reported and this figure should be treated as approximate. The main structural differences between that legacy market and exchange-listed contracts are standardization, continuous public price discovery, and the availability of historical pricing data, rather than necessarily the type of risk being transferred.

Markets Available on Kalshi

Contracts are organized around four broad categories, summarized in the table below: temperature and precipitation markets by city across a range of frequencies from hourly to seasonal; longer-dated global markets tied to climate benchmarks; and regional markets on natural disaster counts such as hurricanes.

Climate Market Taxonomy

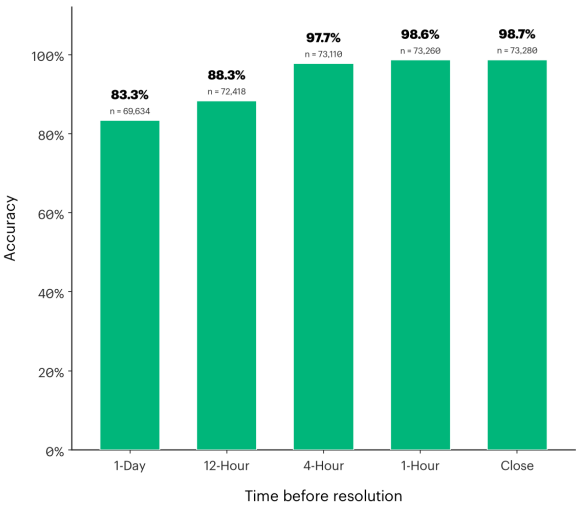


Type	Location	Frequency	Examples
Temperature	By City	Hourly Daily Weekly Monthly Heatwaves	Highest temperature in New York today?
Snow and Rain	By City	Daily Weekly Monthly	Rain in Los Angeles this month?
Climate Change	Global	Monthly Yearly	Will 2026 be the hottest year ever?
Natural Disasters	By Region	Monthly Yearly Seasonal	How many major Atlantic hurricanes will there be this year?

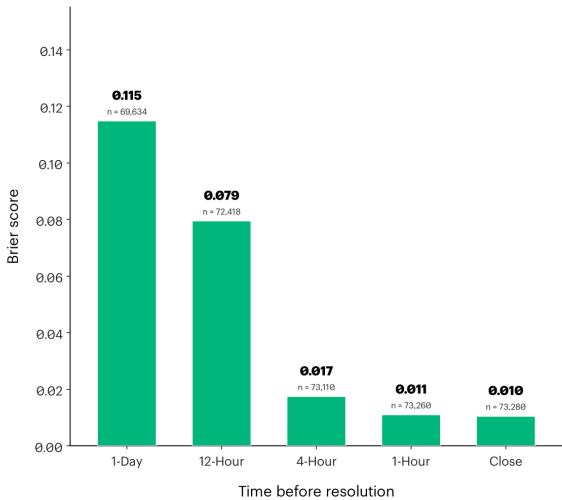
Forecast Accuracy: Climate Markets

Kalshi has published accuracy and Brier score statistics for its daily weather markets (largely temperature and precipitation contracts) across a sample of roughly 69,600 to 73,300 resolved markets at each of five horizons before resolution. Accuracy, defined here as the share of markets in which the higher-priced outcome ultimately occurred, rises from 83.3% one day ahead to 88.3% at twelve hours, 97.7% at four hours, 98.6% at one hour, and 98.7% at close. The Brier score, which combines calibration and sharpness into a single measure where lower values are better, falls over the same horizons from 0.115 to 0.010.

Accuracy by Time Horizon



Brier Score by Time Horizon

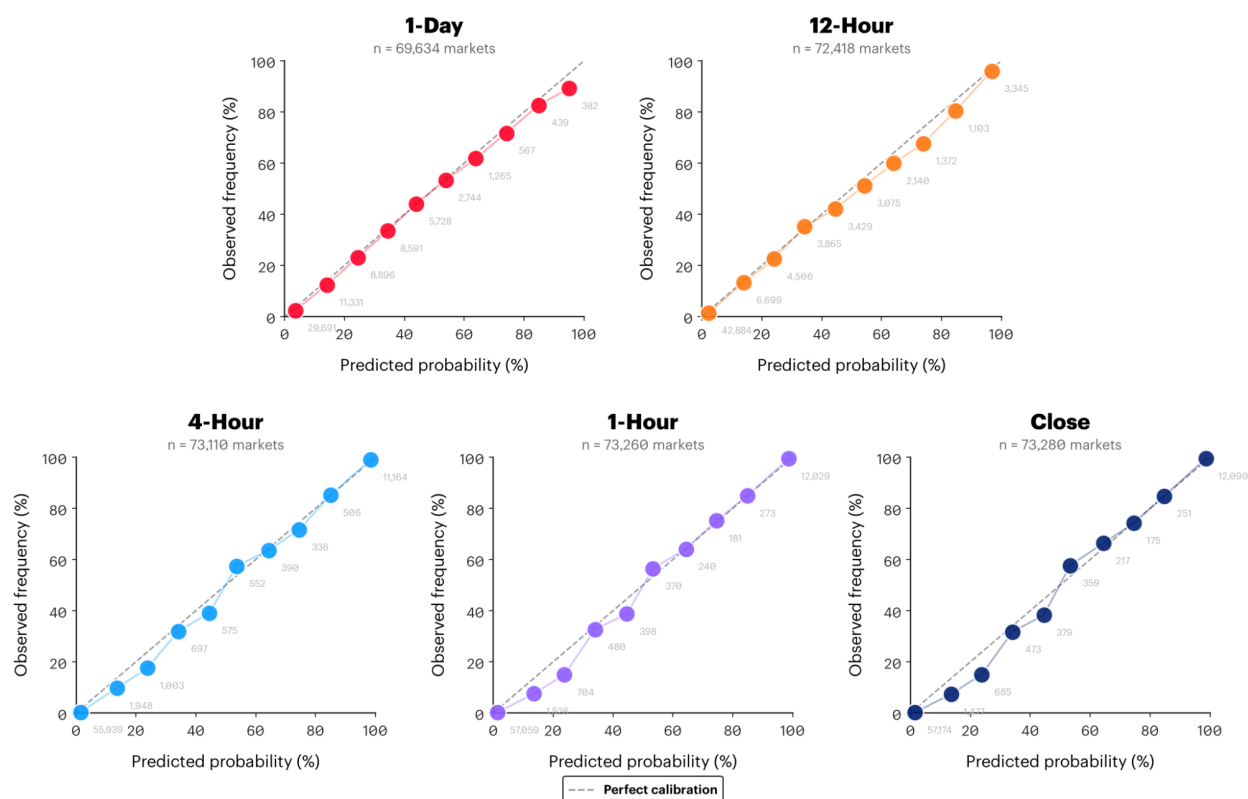


Calibration: Daily Weather Markets

Calibration compares stated probabilities against observed outcome frequencies: a market pricing an event at 70% should see that event occur close to 70% of the time it is priced that way. Across all five horizons tested, the daily weather markets track the line of perfect calibration closely, with only modest divergence at the extreme ends of the probability range, where the underlying bucket sample sizes are thinner (as indicated by the smaller counts labeled near each point). This pattern is broadly consistent with well-functioning markets, though it is also unsurprising given the very large sample sizes involved: each horizon reflects between roughly 70,000 and 73,000 resolved markets.

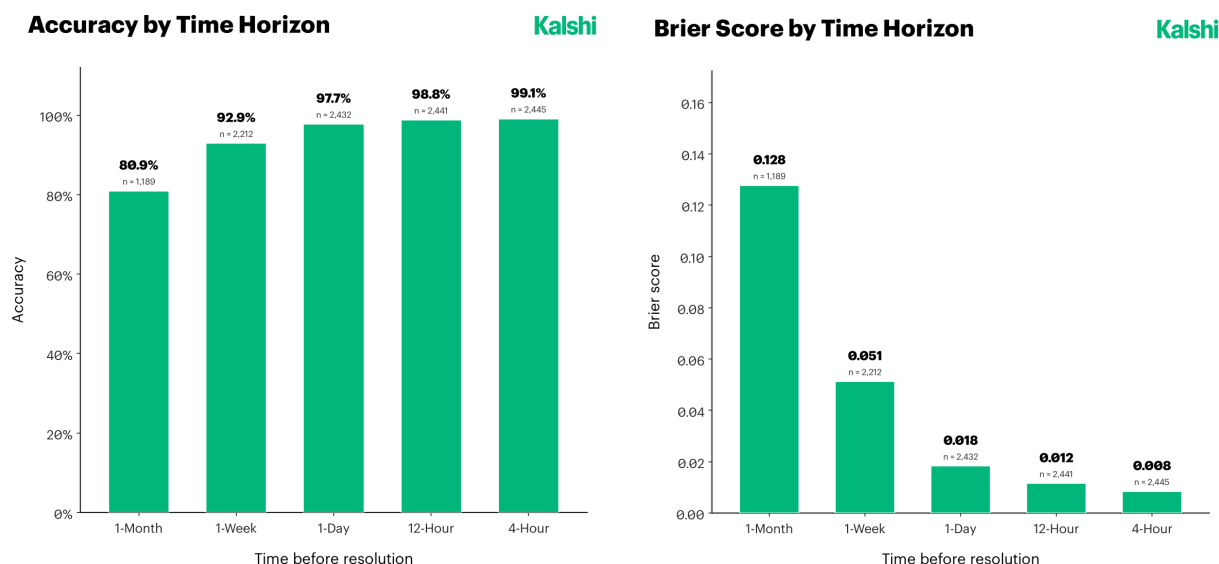
Calibration by Time Horizon — Daily Weather Markets

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Forecast Accuracy and Calibration: Longer-Horizon Climate Markets

Kalshi separately reports accuracy and Brier score statistics for climate markets outside the daily weather category (weekly, monthly, and seasonal contracts on precipitation, snowfall, and related targets). Accuracy ranges from 80.9% at the one-month horizon to 99.1% at four hours before close, with the Brier score falling from 0.128 to 0.008 over the same range.



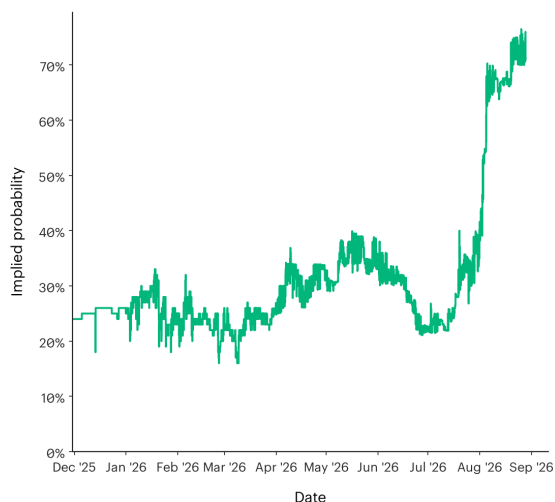
Climate Change Indicators

Kalshi also lists longer-dated contracts that provide a market-based readout on climate trajectories and policy outcomes. As of late August 2026, the implied probability that 2026 will be the hottest year on record stood near 75%, up from roughly 25% at the start of the year. Most of that increase occurred as a step change in July, coinciding with widely reported record-breaking heat in July and August of this year. A separate contract on whether August 2026 will be the hottest August on record moved from roughly 40% in early August to near 97% by month end, tracking realized temperature reporting over the course of the month. This pattern, prices moving in response to information becoming available as the underlying event unfolds, is consistent with normal market repricing rather than a forecast made substantially in advance of the outcome.

Separately, Kalshi lists markets on whether major economies will meet their stated 2030 greenhouse gas targets. The United States has committed to a 50-52% reduction in emissions below 2005 levels by 2030; the European Union to a 55% reduction from 1990 levels; and India to a 45% reduction in emissions intensity from 2005 levels, alongside a target of 50% non-fossil power generation capacity. Over the period shown, the U.S. target has generally been priced in a 10% to 25% implied-probability range, aside from a brief spike around year-end 2025 and a rise to roughly 40% in August 2026 that has since partly reversed. The EU target has traded in a comparatively narrow 40% to 55% band. India's target has been priced highest of the three throughout the period but has drifted down from roughly 78% in late 2025 to the low 60s by late summer 2026.

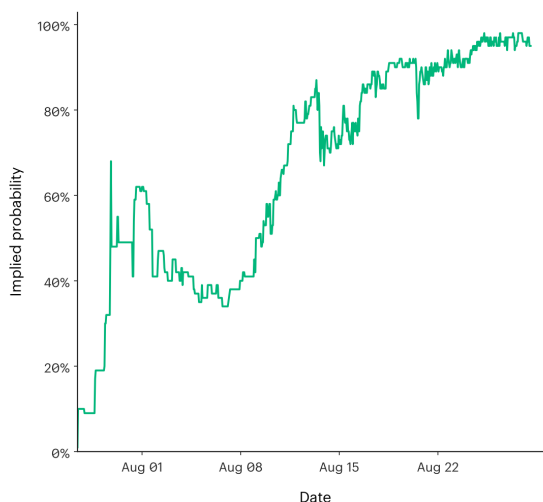
2026 Hottest Year on Record?

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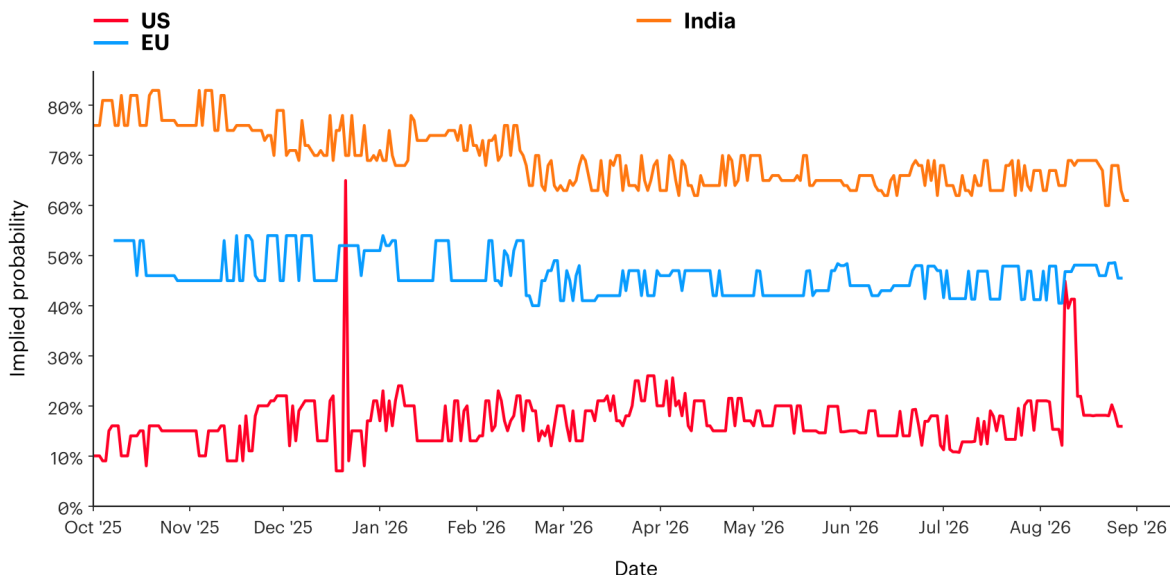
Aug 2026 Hottest August Ever?

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Will 2030 Climate Goals be met?

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Hurricanes

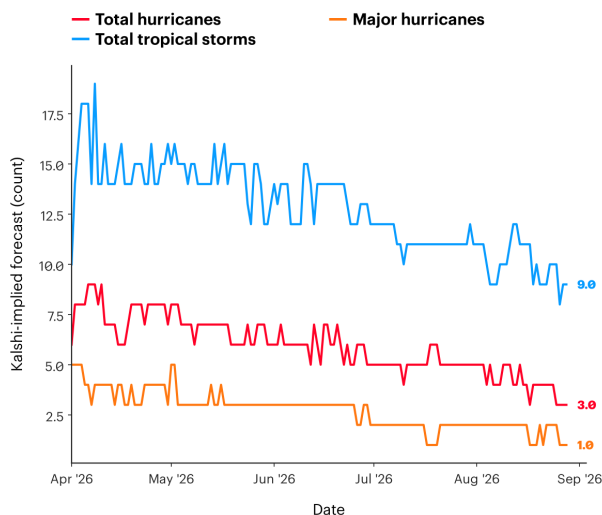
NOAA's outlook published May 21, 2026 called for 8 to 14 named storms, 3 to 6 hurricanes, and 1 to 3 major hurricanes in the Atlantic basin for the season running June through November. Kalshi's hurricane markets were within that range at the time and have since converged toward its lower end: as of late August, the market-implied full-season forecast stood at approximately 9 named storms, 3 hurricanes, and 1 major hurricane, with four storms having formed and no hurricanes yet recorded. For comparison, market-implied forecasts for total named storms at a comparable point in the season (mid-to-late August) stood at roughly 20 in 2023, 17 in 2024, and 14 in 2025, so the 2026 figure of roughly 9 would extend a declining trend observed across the three prior seasons. That said, the comparison set is only four seasons, and Atlantic hurricane activity is known to vary substantially year to year for reasons, including El Nino/La Nina cycles and sea surface temperature anomalies, that are not captured in this dataset.

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Since 1980, hurricanes have caused an estimated \$1.5 trillion in cumulative U.S. damage, averaging approximately \$2.5 billion per storm, though loss severity is highly skewed toward a small number of major landfalling storms. Kalshi's Central Pacific markets currently imply 6.1 named storms and 2.0 major hurricanes for the season; its Eastern Pacific markets imply 19.4 named storms and 4.9 major hurricanes.

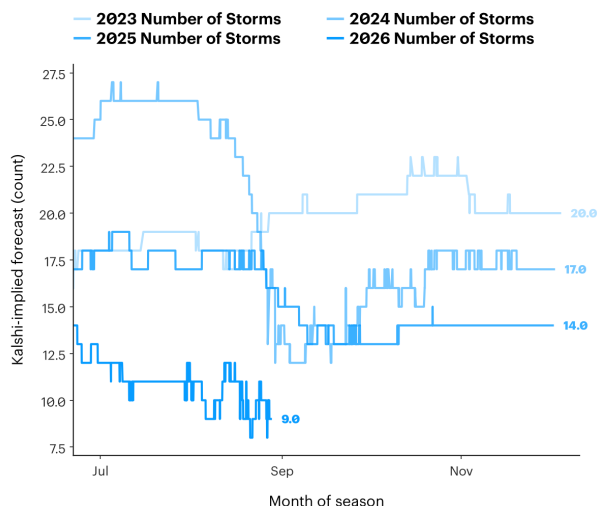
2026 Atlantic Hurricane Season

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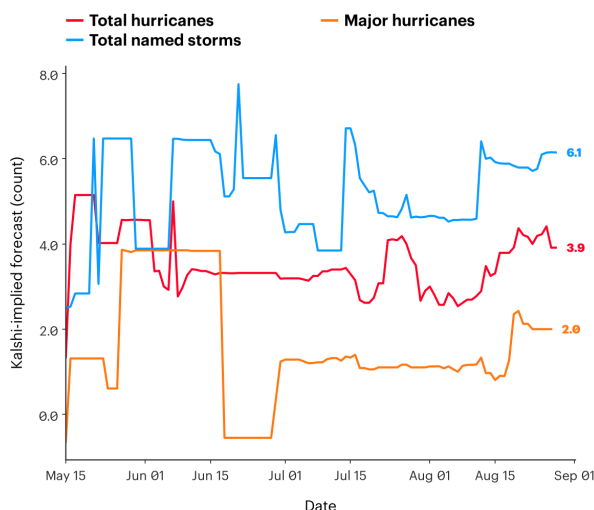
The 2026 Atlantic Hurricane season is expected to be the calmest in Years

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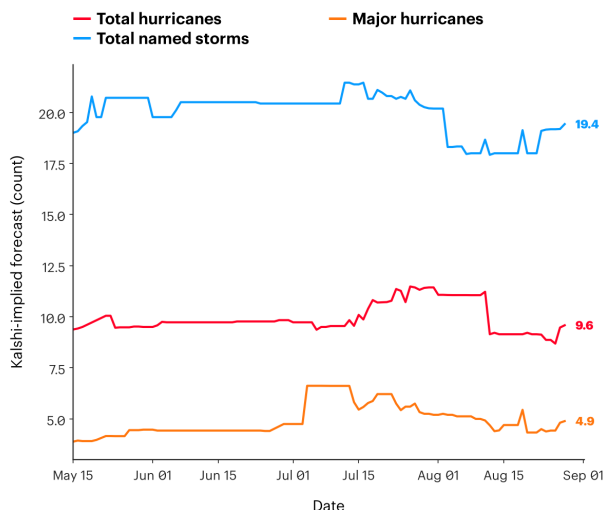
2026 Central Pacific Hurricane Season

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2026 Eastern Pacific Hurricane Season

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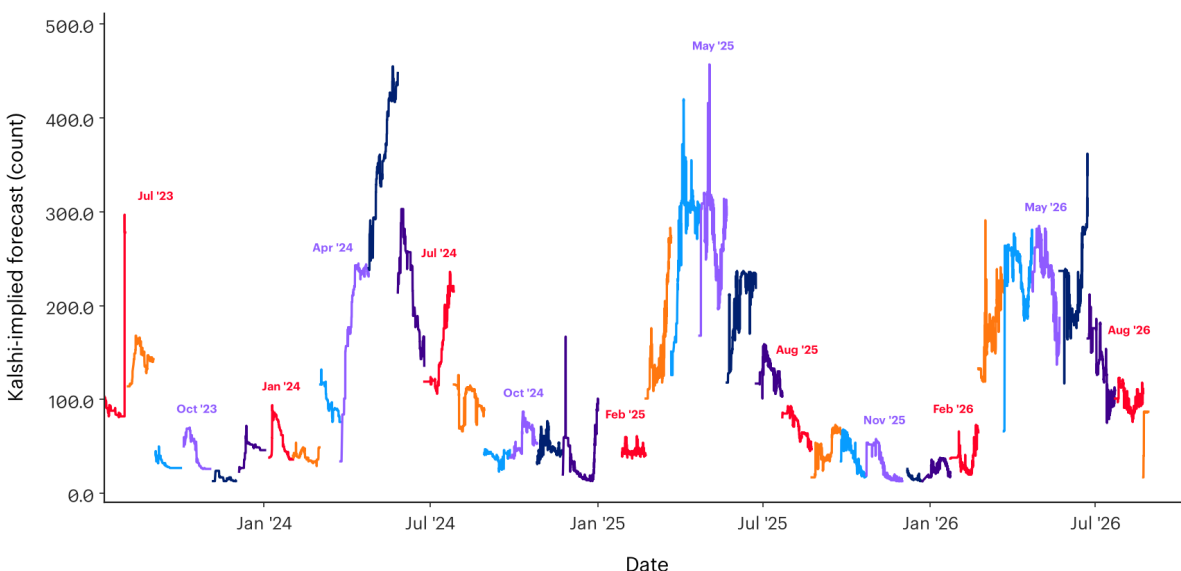
Tornados

Kalshi lists monthly markets on the number of tornadoes recorded in the United States. Tornado activity is seasonal, with historical activity typically peaking in May in connection with jet stream patterns. Market-implied forecasts from 2023 through 2026 show this seasonal shape clearly, with each year's series rising into a spring or early-summer peak before declining toward year-end, and with considerable month-to-month volatility (implied forecasts for a given month have ranged from under 50 to over 400 across the period shown). The market-implied forecast for August 2026 stood at 96 tornadoes as of the report date, above the 54 recorded in August 2025. The average annual cost of U.S. tornado damage is estimated at \$4.6 billion, roughly an

order of magnitude below cumulative hurricane losses, broadly consistent with tornadoes causing more geographically concentrated, individually smaller-scale damage.

Monthly US Tornado Forecasts, 2023–2026

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Hedging Weather-Dependent Revenue: The Use Case for Businesses

Because Kalshi's weather contracts are exchange-traded and continuously priced, they can in principle be used by businesses with weather-sensitive revenue to offset some of that exposure, in a manner similar to how traditional over-the-counter weather derivatives have been used since the 1990s, historically by larger counterparties given the customization and minimum-size conventions typical of that market.

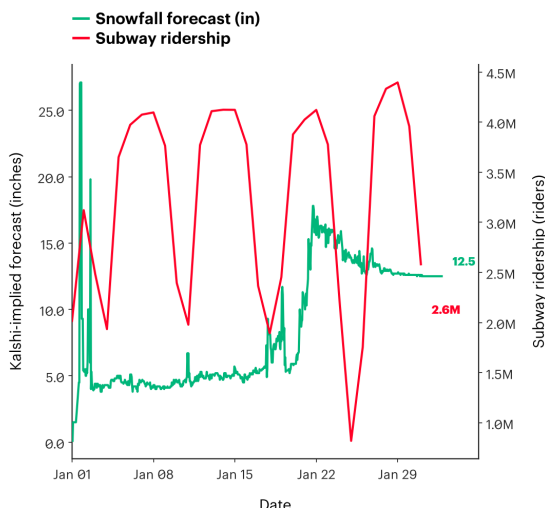
LAX Daily High Temperature Forecasts, April 15–August 2026

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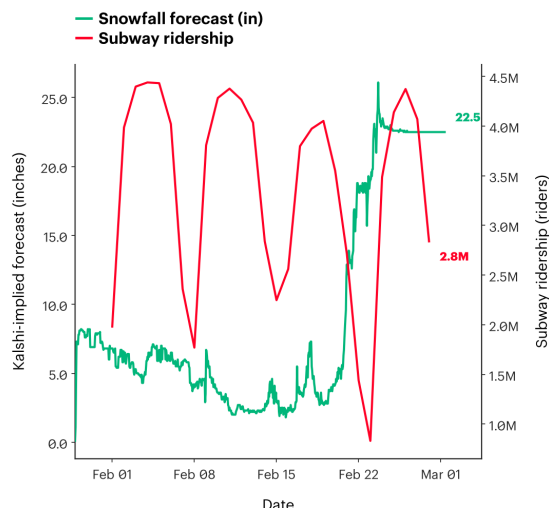
For instance, 28 Wishes in Los Angeles, an ice cream shop, realised that their sales declined approximately 20% whenever temperatures dipped below 70F. Their hedges on Kalshi have paid out \$1,500 a month, equivalent to 43% of the business's monthly rent in that period.

NYC Snowfall — Jan 2026



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NYC Snowfall — Feb 2026



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Closer to home, New York experienced two significant snowstorms in January and February 2026. Daily subway ridership, plotted alongside Kalshi's snowfall forecasts for each month, fell by up to 1 million riders on the days of heaviest snowfall relative to typical levels earlier in each month. A hedge established at the start of each month using Kalshi's snowfall markets would, based on this chart, have been positioned to pay out around the time of the ridership declines shown, given the inverse relationship between snowfall and subway usage visible in the data. As with the Los Angeles example, this is an illustrative case rather than a rigorous backtest: it does not account for the cost of establishing the hedge, the position size needed to offset a given amount of revenue risk, or the correlation between citywide ridership and the revenue of any specific business.

Conclusion

The more interesting question raised by this data is not whether Kalshi's weather markets are accurate, the daily calibration data are hard to argue with, but who is positioned to make use of them. Traditional weather derivatives have existed for decades, but their OTC structure, bespoke contract terms, and large typical notional sizes have effectively restricted them to sophisticated counterparties with dedicated risk-management resources. An exchange-traded contract referencing a single city and a single day, at a minimum size accessible to a small business, is a structurally different instrument, and the evidence reviewed here suggests the pricing mechanism behind it is, at minimum, working with the businesses using it.

About Kalshi Research

Signal-rich analysis of prediction markets. Questions, data access (currently free for institutional clients), or collaboration: research@kalshi.com

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