

Tornadoes in the News, 2019-2026: Seasonality, Geography and Tone of Global Tornado Coverage, and How It Compares with Research and Invention

Fliar BI · Prism Research Layer · Working paper, October 2026 · Dataset and code: github.com/fliarbi/prism-news-api · Licence CC BY-NC 4.0

Abstract

We measure how tornadoes were covered in a global news index from January 2019 to July 2026, using 59,029 de-duplicated tornado articles, and set that coverage beside 2,734 research papers (2015-2025) and 214 patent families (2015-2024) on tornadoes. Six results stand out:

1. **Seasonality.** On average 41.7% of each year's tornado coverage appears in March, April and May.
2. **Attention, not occurrence.** Tornadoes took a 45.6% smaller share of news in 2020 than in 2019. Their share peaked in December 2021, the month of the 10-11 December outbreak, at 21.57 articles per 10,000.
3. **Geography.** The United States holds 87.74% of located tornado news, 1.81 times its share of all located news. North America is the only over-represented continent; Europe (0.26) and Asia (0.13) are far below their weight. Within the United States, Mississippi (8.63), Arkansas (4.65) and Kentucky (4.49) lead, and New Jersey (0.07) is lowest.
4. **Tone and urgency.** 74.5% of tornado articles are negative in tone (all news: 33.6%), and 70.9% are rated critical priority (all news: 42.6%).
5. **Measurement.** 23.2% of raw matches for tornado vocabulary were templated forecasts, page boilerplate, other senses of the word or figurative uses. Counting them would inflate coverage.
6. **Research and invention.** Tornado papers fell from 0.51 to 0.29 per 10,000 papers between 2015 and 2025, a 43.1% fall in share. Patent families are few: 18 in 2015 and 29 in 2024.

Findings stated for citation

- **F1.** Between 2019 and 2025, an average of 41.7% of each year's tornado news appeared in March-May, against 25% for an even spread.
- **F2.** Tornadoes took a 45.6% smaller share of news in 2020 than in 2019 (2.98 vs 5.48 per 10,000 articles).
- **F3.** December 2021 was the peak month for tornado news, at 21.57 articles per 10,000, 4.3 times the 2021 share.
- **F4.** The United States' share of located tornado news (87.74%) was 1.81 times its share of all located news.
- **F5.** Europe's lift was 0.26 and the United Kingdom's 0.27.
- **F6.** Asia's lift was 0.13 and India's 0.09.

- **F7.** 74.5% of tone-labelled tornado articles were negative, 2.22 times the all-news share.
- **F8.** 70.9% of tornado articles were rated critical priority, 1.66 times the all-news share.
- **F9.** 23.2% of raw tornado-vocabulary matches were templated items, other senses or figurative uses.
- **F10.** A power-grid collapse theme appeared in 3.94% of themed tornado articles, 57.99 times its frequency in all themed news.
- **F11.** Tornado papers fell 43.1% as a share of all papers between 2015 and 2025.
- **F12.** Within the United States, Mississippi (8.63), Arkansas (4.65) and Kentucky (4.49) had the most over-represented tornado coverage; New Jersey (0.07) the least.
- **F13.** Mississippi (8.63), Arkansas (4.65), Kentucky (4.49) and Alabama (3.23) were among the ten most over-represented states, with Oklahoma (4.03) and Nebraska (3.95).
- **F14.** Tornado coverage per 10,000 of Canada's news fell 41.5% from 2023 to 2025 (3.11 to 1.82), against a 23.6% fall in the United States.
- **F15.** Against each country's own baseline, tornado news was most negative in the United States (2.39 times) and Canada (2.26 times).

1. Introduction

Tornadoes are among the most violent weather events. Most of them occur in the United States, but they strike every continent except Antarctica. News is often the first public record of a tornado: where it touched down, what it destroyed and who was hurt. News coverage also shapes what the public and officials treat as urgent. Yet coverage is rarely measured as data in its own right. Storm databases record tornadoes. Bibliometric studies record research. Few sources record attention, meaning how much of the news tornadoes take and when, where and in what tone.

This paper and its dataset do that. They combine three records for one topic: a global news index, research papers and patents. Each comparison uses a denominator, so that growth in the index or in publishing is not mistaken for growth in interest. The companion dataset publishes an article-level sample (14,936 rows) and full coverage tables, so every figure here can be re-derived. The [Prism News API](#) serves the full history.

2. Data and methods

News. The Prism news index holds articles from outlets worldwide; non-English articles are indexed in English translation. Each article carries its opening text (the first few sentences), a primary location, a graded tone label, an editorial priority rating (1–9), themes, keywords and named organisations. We count unique article identifiers; repeated rows for the same article are removed. When this release was built, 92.88% of the index was readable, so all counts are lower bounds.

Matching. An article is about tornadoes when its opening text contains *tornado*, *tornadoes* or *tornadic* as whole words. Four families of matches are excluded:

- templated items: local forecast pages that repeat "possibly a tornado with some storms", numbered watch bulletins and automated weather alerts;

- site-navigation menus that carry a tornado headline above an unrelated article;
- other senses of the word: a cryptocurrency mixer, a combat aircraft, a motorcycle model, team nicknames, a video game and a film;
- figurative uses ("a tornado of emotions", the butterfly-effect metaphor).

Together these removed 17,829 of 76,858 raw matches (23.2%). One reviewer read 40 randomly drawn matched openings after the exclusions. 37 used tornado in its meteorological sense (precision 92.5%), and in 30 (75%) tornadoes were the main subject. The false positives were a garbled translation, an awards list and a broadcast transcript about other local news.

Measures. Coverage over time is expressed per 10,000 articles in the index that month or year, because the index grew from 11,807,177 articles in 2019 to 26,990,006 in 2025. Seasonality uses each year's within-year month shares, averaged over the complete years 2019–2025. Geography, tone, priority and themes use January 2023 – July 2026. Geography is expressed as lift: a place's share of tornado articles divided by its share of all located articles. For states, the baseline is all located news from that country. Place tags derived from ordinary words (such as "Congress", "Earth", "Winter" or "Hurricane") were treated as unlocated in every location field, which removed 15.3% of city-tagged articles.

Research and patents. Research papers are de-duplicated articles and reviews (2000–2025) with a tornado term in the title. Repository deposits, solar and astrophysical "tornadoes", tornado diagrams in sensitivity analysis and tornado-type engineering devices are excluded. Patent families (2006–2024) use the same title rule, with storm and tornado shelters added, and exclude cyclone separators, kitchen hoods, mixers, toys and similar vortex devices. Families are counted once per filing office.

3. Results

3.1 How much and when

The index holds 59,029 tornado articles from January 2019 to July 2026. Raw counts rose from 6,475 in 2019 to 8,659 in 2025, but the share of all news did not: 5.48 per 10,000 in 2019, 4.3 in 2024 and 3.21 in 2025 (Table 1). The low point was 2020, at 2.98 per 10,000. That is 45.6% below 2019. 2020 was also the first year of the COVID-19 pandemic; no cause for the fall is tested here. The share fell again by 25.3% from 2024 to 2025. The highest monthly share was December 2021, at 21.57 per 10,000, the month of the 10–11 December outbreak in the central and southern United States (Figure 1). That month's share was 4.3 times the share for 2021 as a whole. The next highest months were May 2019 (13.24), March 2019 (10.84) and May 2024 (10.76).

Year	Tornado articles	All articles in index	Per 10,000
2019	6,475	11,807,177	5.48
2020	4,839	16,230,014	2.98
2021	8,682	17,281,220	5.02
2022	6,418	19,115,515	3.36
2023	8,557	20,484,506	4.18
2024	10,029	23,311,896	4.3
2025	8,659	26,990,006	3.21

Table 1. Tornado articles per year and as a share of the index. 2026 (January–July) is partial and omitted.

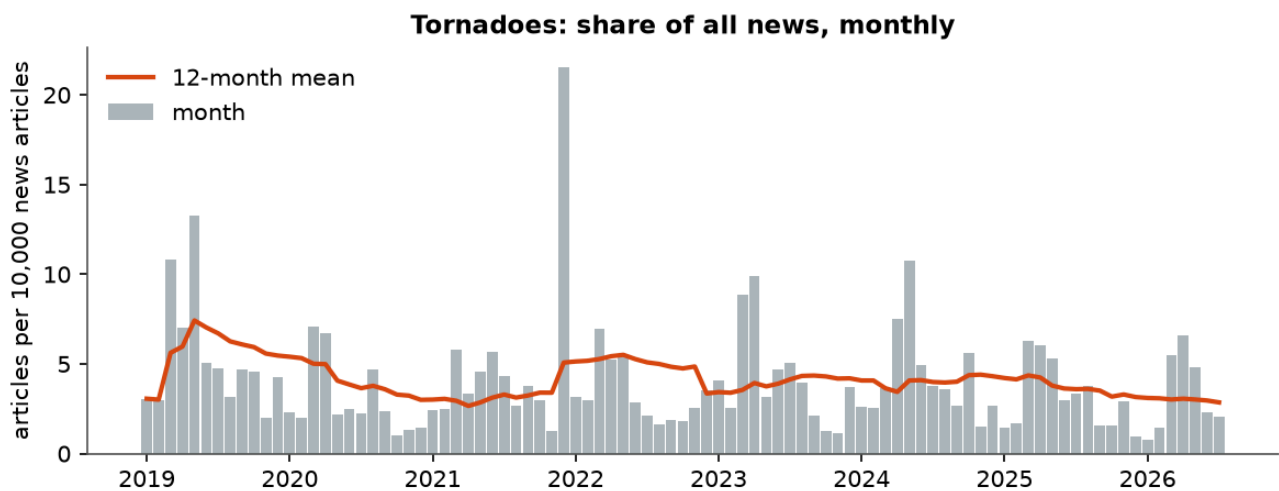


Figure 1. Tornado coverage as articles per 10,000 news articles, monthly, January 2019 – July 2026. Bars are months; the line is the 12-month mean.

Coverage is strongly seasonal (Figure 2). March (15.28%), April (13.63%) and May (12.79%) together hold 41.7% of a typical year's tornado articles. November is the quietest month (3.73%). December holds 9.71%, more than any month from June to November, largely because of the December 2021 outbreak. The pattern matches the North American spring storm season; most located tornado coverage concerns the United States.

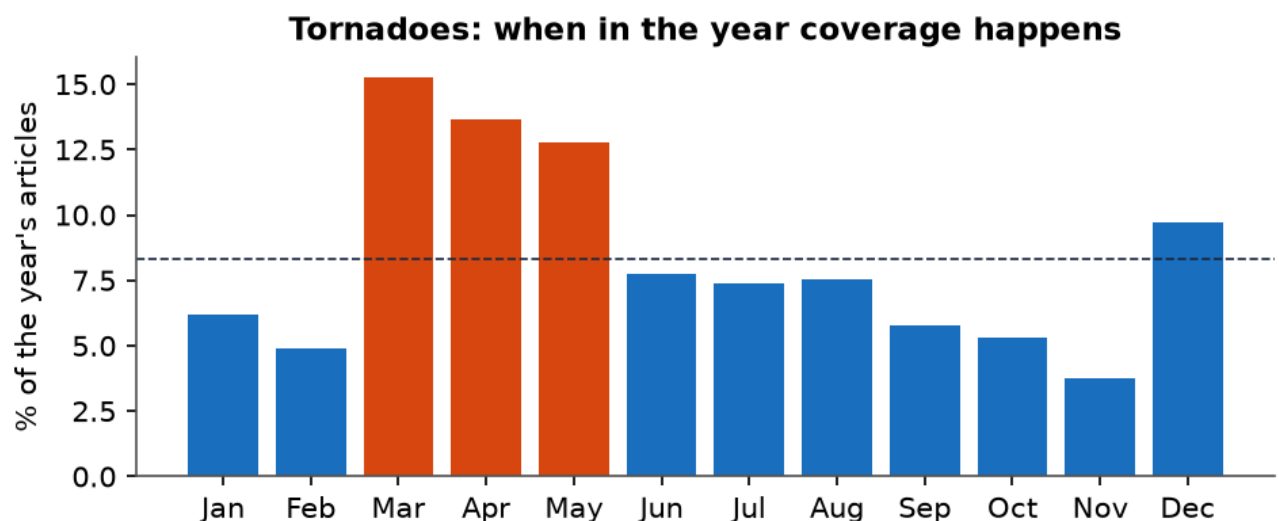


Figure 2. Share of each year's tornado articles published in each month, averaged over 2019–2025. Dashed line = an even spread (8.3% per month).

3.2 Where

Between January 2023 and July 2026, 19,632 tornado articles carried a primary location. The United States holds 87.74% of them, with a lift of 1.81: tornadoes take a larger share of American news than of news overall. Every other country with at least 100 located tornado articles is under-represented except New Zealand (1.14). India, with 241 located articles, has a lift of 0.09, the lowest of the nine (Table 2, Figure 3).

Country	Located tornado articles	Share %	Lift vs all news
United States	17,225	87.74	1.81
United Kingdom	306	1.56	0.27
India	241	1.23	0.09
Canada	239	1.22	0.57
Australia	151	0.77	0.36
New Zealand	145	0.74	1.14
China	131	0.67	0.25
Germany	107	0.55	0.46
Italy	103	0.52	0.54

Table 2. Countries with at least 100 located tornado articles, January 2023 – July 2026, with lift against all located news.

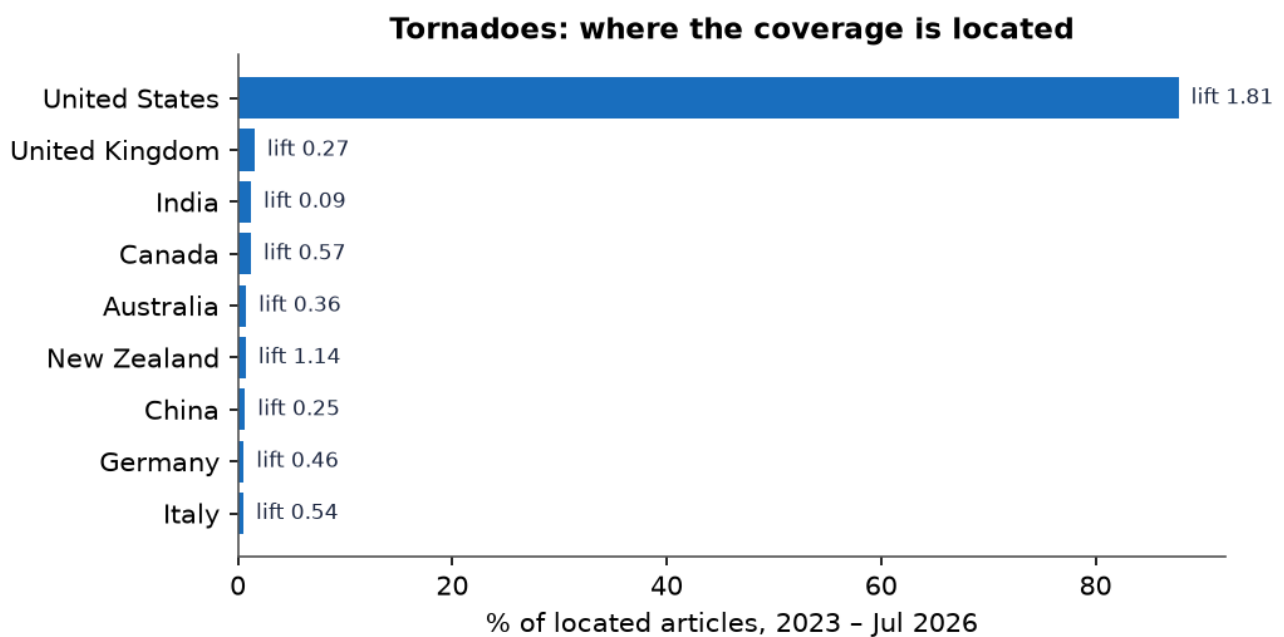


Figure 3. Leading countries by share of located tornado articles, 2023 – Jul 2026, labelled with lift against all located news.

3.3 Geo intelligence: continents, states and shifting attention

The world map (Figure 4) shows how concentrated the topic is. Only nine countries have enough located tornado articles to be shaded. The United States and New Zealand are over-represented; Canada, the United Kingdom, Germany, Italy, Australia, China and India are all under-represented. By continent, North America (1.83) is the only region above its weight. Oceania (0.54), Europe (0.26), South America (0.26), Africa (0.21) and Asia (0.13) fall well below it (Figure 6, left). Lift measures attention, not tornado activity: a low lift for Europe or Asia says only that tornadoes take a small share of the news located there [2, 7].

Tornadoes: which countries over- and under-cover the topic

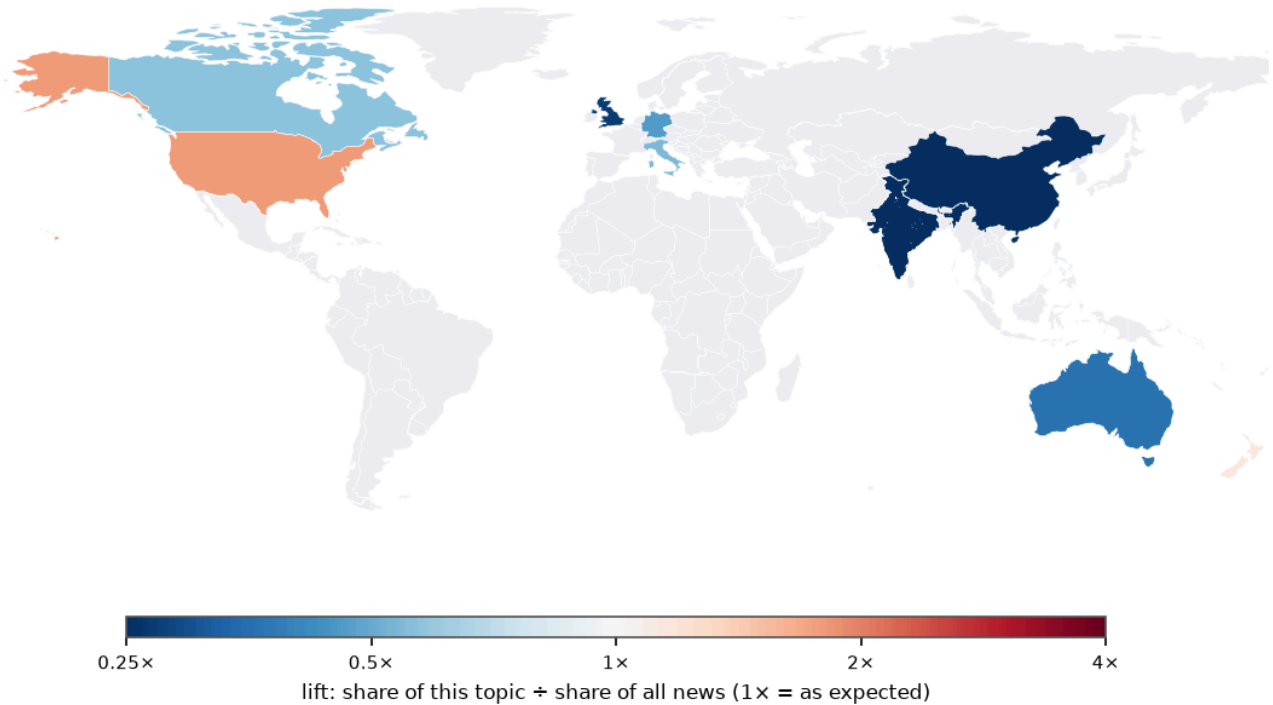


Figure 4. Lift of each country's share of located tornado articles, January 2023 – July 2026 (red = over-represented, blue = under-represented, grey = fewer than 100 articles). India is drawn with its official outline.

Within the United States, the picture is sharper (Table 3, Figure 5). Measured against each state's share of American news, tornado coverage concentrates in the South and the central Plains. Mississippi (8.63), Arkansas (4.65), Kentucky (4.49), Oklahoma (4.03), Nebraska (3.95) and Missouri (3.9) are the most over-represented. Southern states (Mississippi, Arkansas, Kentucky, Alabama) and Plains states (Oklahoma, Nebraska, Iowa, Kansas) both appear among the ten highest lifts. New Jersey (0.07), New York (0.31), Pennsylvania (0.32), Nevada (0.38) and California (0.45) are far below their weight in American news. India has too few located tornado articles for a state analysis: 195 carry a state, and no state has 50.

Highest lift: state	Articles	Lift	Lowest lift: state	Articles	Lift
Mississippi	919	8.63	New Jersey	223	0.07
Arkansas	302	4.65	New York	593	0.31
Kentucky	254	4.49	Pennsylvania	311	0.32
Oklahoma	804	4.03	Nevada	64	0.38
Nebraska	272	3.95	California	739	0.45
Missouri	633	3.9	Utah	76	0.52
Alabama	603	3.23	Washington	221	0.52
Indiana	694	3.09	Connecticut	62	0.54

Table 3. US states with the most and least over-represented tornado coverage, January 2023 – July 2026 (states with at least 50 tornado articles). Lift = the state's share of located US tornado articles ÷ its share of all located US news.

Tornadoes: states of United States by lift

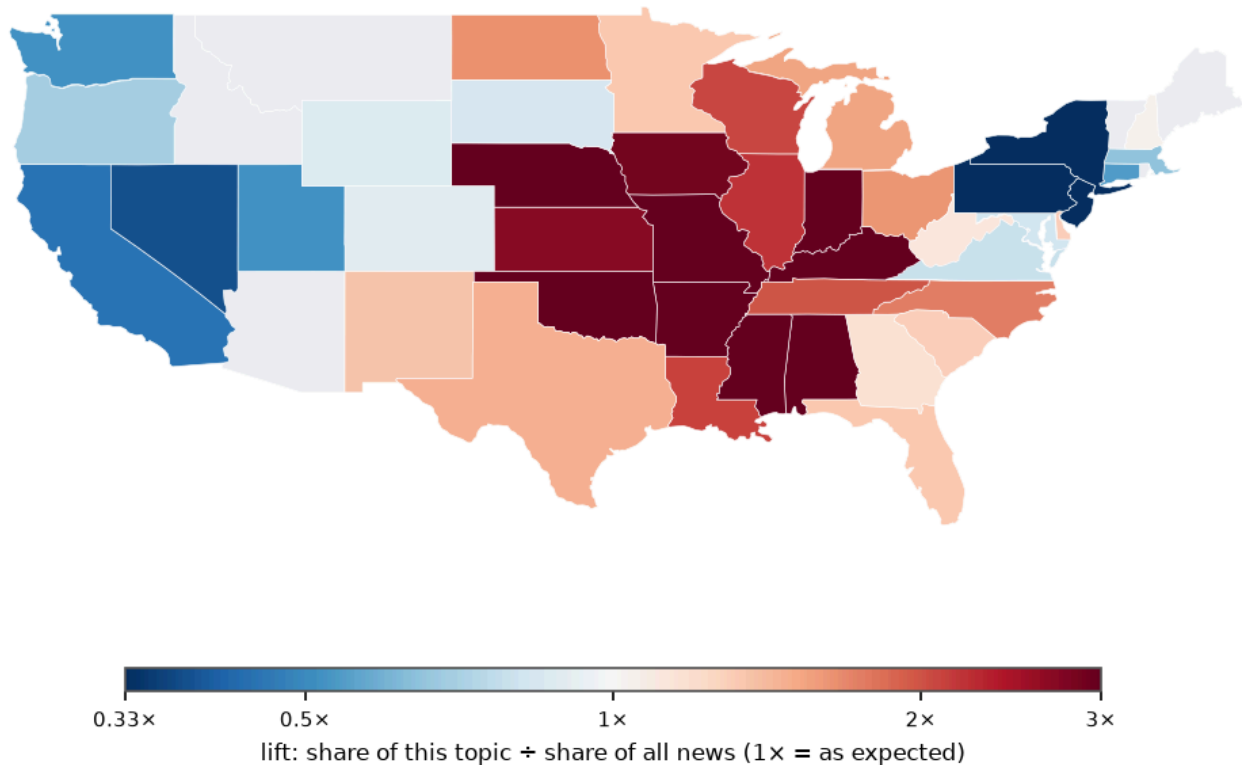


Figure 5. Lift of each US state's share of located tornado articles against its share of all located US news, January 2023 – July 2026.

Attention also moves between countries from year to year (Figure 6, right). Measured as tornado articles per 10,000 of each country's located news, the United States fell from 9.99 in 2023 to 7.63 in 2025 (23.6%), after a high of 10.61 in 2024. Canada fell from 3.11 to 1.82 (41.5%) and China from 2.35 to 0.29, while Australia rose from 1.52 to 2.26. New Zealand moved most from year to year, between 3.57 and 7.26. Tornado coverage is negative in tone in every country, but most of all relative to each country's news overall in the United States (79.0% negative against 33.1%, 2.39 times) and Canada (61.3% against 27.1%, 2.26 times). The United Kingdom (63.1% against 36.9%, 1.71 times) and India (67.1% against 41.2%, 1.63 times) follow.

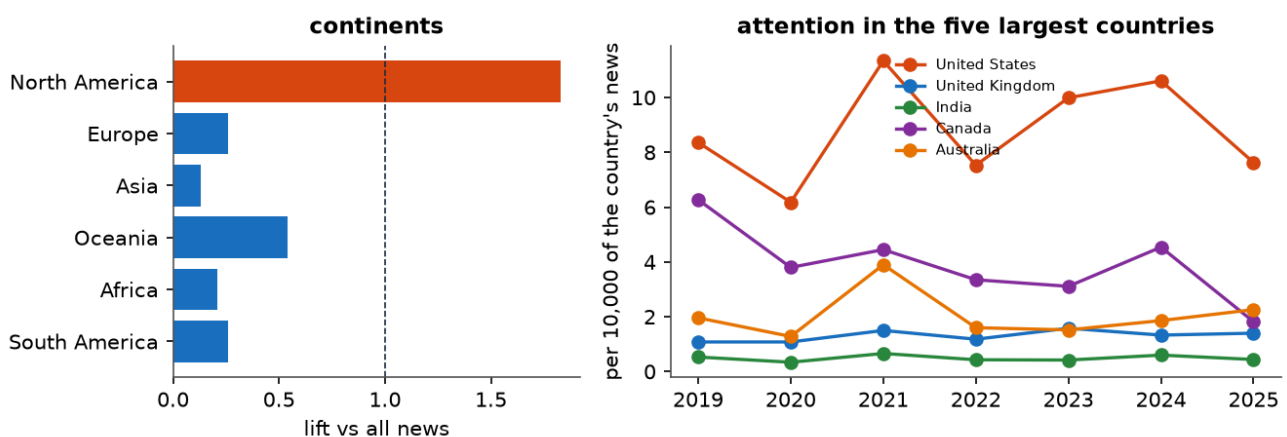


Figure 6. Left: lift by continent, January 2023 – July 2026. Right: tornado articles per 10,000 of each country's located news, 2019–2025, for the five countries with the most articles.

3.4 Tone, urgency and themes

Tornado coverage is far more negative and more urgent than news in general (Figure 7). Among articles with a tone label, 74.5% are negative, against 33.6% across the index (2.22 times). A machine-assigned priority rating puts 70.9% of tornado articles at critical level (7 or higher), against 42.6% of all news (1.66 times).

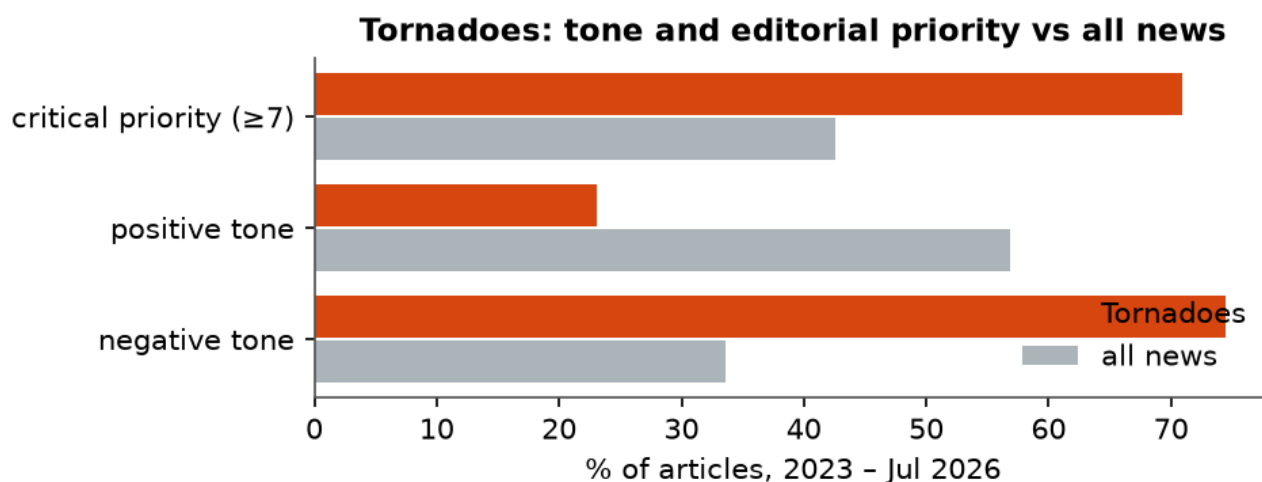


Figure 7. Tone and the share rated critical priority, tornado articles vs all news, 2023 – Jul 2026.

Themes show what tornado stories are about (Table 4). Severe weather warnings are the most common theme (55.32% of themed articles), and tornado and cyclone reports, the most specific, appear in 50.0% with a lift of 613.71. A theme on power-grid collapse appears in 3.94%, 57.99 times its rate in all themed news.

Theme	Articles	Share %	Lift
tornado and cyclone reports	10,768	50.0	613.71
extreme weather events	5,399	25.07	131.15
satellite and radar imagery analysis	405	1.88	122.71
weather technology advancements	466	2.16	113.01
severe weather warnings	11,915	55.32	110.89
hurricane/cyclone impact studies and preparedness	6,223	28.89	105.04
severe weather advisories and impact reports	2,140	9.94	100.55
power grid collapse scenarios	849	3.94	57.99

Table 4. Themes most specific to tornado coverage (lift against all themed news), January 2023 – July 2026.

The organisations named most often are weather and emergency agencies: the National Weather Service (3,436 articles), the Federal Emergency Management Agency (1,719), the National Oceanic and Atmospheric Administration (945), the Storm Prediction Center (923) and the American Red Cross (527). Wire services and broadcasters also rank high, which reflects how tornado news is sourced.

3.5 Research attention and invention

Research on tornadoes did not keep pace with the scientific literature. Papers with a tornado term in the title peaked at 0.53 per 10,000 papers in 2014, stood at 0.51 in 2015 and fell to 0.29 in 2025, a 43.1% fall in share. Between 2015 and 2025, 2,734 such papers were published. The leading venues are meteorology journals and severe-storm conference proceedings. The most-cited work covers the storm environments that produce tornadoes, field campaigns, intensity estimation and trends in United States tornado frequency [1–6].

News attention and research attention both fell in share over the period, but on different paths (Figure 8). Research share declined steadily, while news share fell in 2020, recovered with the 2021 outbreaks and has moved with storm seasons since.

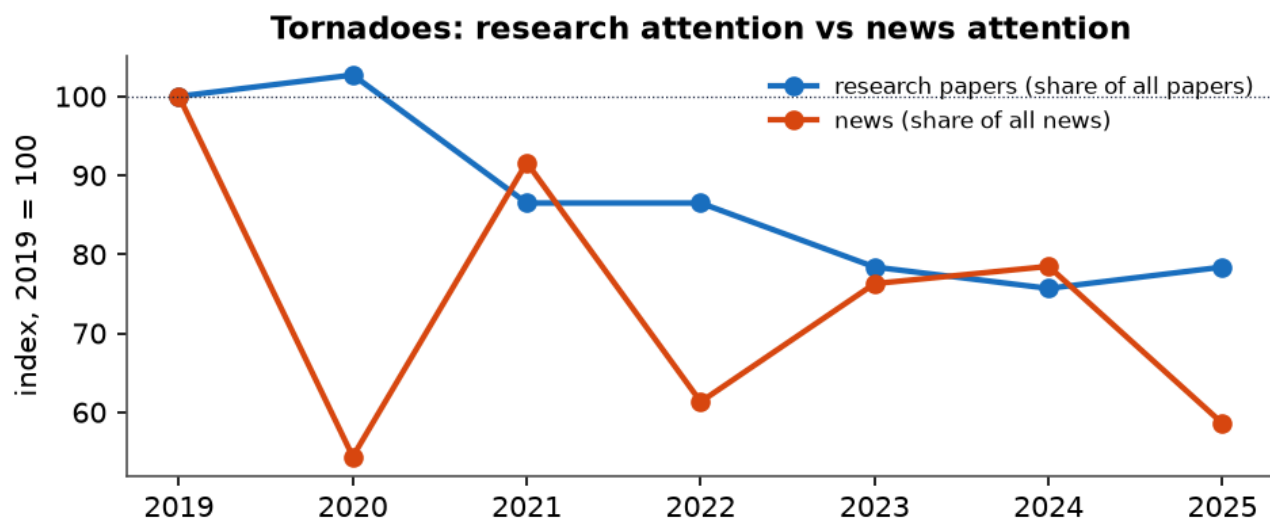


Figure 8. Research papers with tornado in the title (share of all papers) and tornado news (share of all news), each indexed to 2019 = 100.

Patenting is small. 18 tornado-related patent families were published in 2015 and 29 in 2024 (1.61 times), 214 in all from 2015 to 2024. China's office holds 55.2% of office filings, followed by the United States (20.1%) and South Korea (7.2%) (Figure 9). The most common technology classes are testing equipment such as tornado simulators (G01M, 23 families) and shelters (E04H, 11). Many remaining titles describe demonstration devices rather than protection or detection, so the series is shown but not stated as a finding.

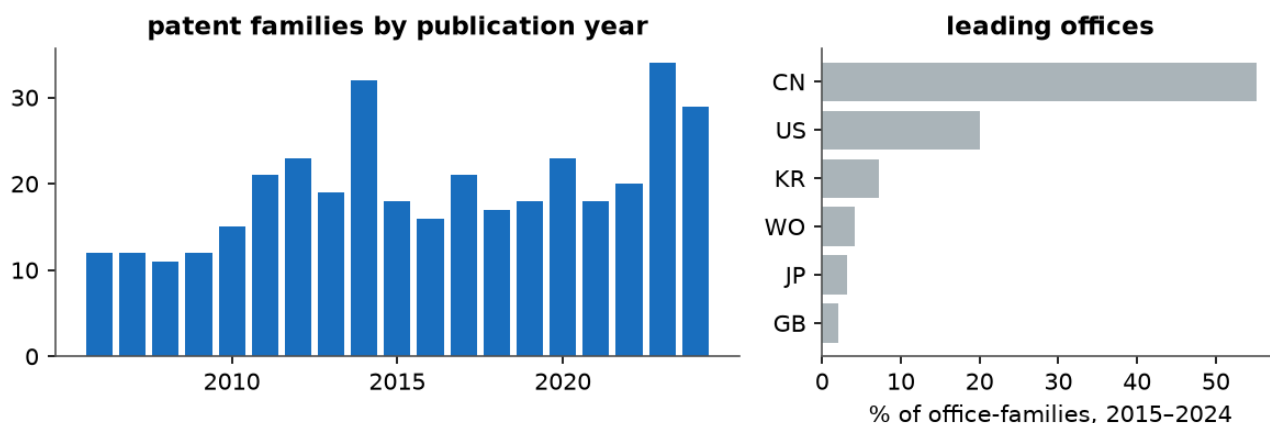


Figure 9. Tornado-related patent families by publication year (left) and the leading filing offices, 2015-2024 (right).

4. Discussion

Three points matter for anyone who uses news as a record of tornadoes. First, coverage measures attention. The 2020 trough and the December 2021 peak are measures of attention, not of the number of tornadoes; this paper does not test what drove them. Second, tornado news is almost entirely American news. The United States holds nearly nine in ten located articles, and other countries with real tornado climates, in Europe, South Asia and South America, take a much smaller share of their own news for the topic. Within the United States, both Southern and Plains states are over-represented. Third, a large share of what keyword searches return as "tornado news" is not journalism about tornadoes: templated

forecasts, page boilerplate and other senses of the word made up nearly a quarter of raw matches.

Research, invention and news run on different clocks. Research share has declined for a decade, even as the most-cited papers study changing tornado frequency, exposure and warnings [5, 6, 8, 9]. Patent activity is small and mixed in purpose. News follows the spring season and the big outbreaks. The dataset lets researchers link the three, for example to test whether outbreaks with heavy coverage are followed by research in the affected region.

5. Limitations

- **Index availability.** 92.88% of the index was readable at build time, so counts are lower bounds. Shares and lifts are less affected, because the missing part is spread across topics.
- **Coverage after May 2026.** The index thins after May 2026, so 2026 is partial and is excluded from year comparisons.
- **Matching.** Matching uses the article opening. Articles that mention tornadoes only later are missed, and 7.5% of matches are not about tornadoes.
- **Machine labels.** Location, tone, priority and themes are machine-labelled. The city field is noisy and is not analysed. Place tags derived from ordinary words (such as "Congress", "Earth", "Winter" or "Hurricane") were treated as unlocated in every location field, which removed 15.3% of city-tagged articles. Located counts are therefore smaller than the raw location tags suggest, and an earlier ranking that placed Wisconsin among the ten most over-represented states did not survive this rule.
- **Outlet mix.** The index over-represents English-language and North American outlets. This shapes both seasonality and geography, and leaves non-US lifts resting on a few hundred articles.
- **Research and patent counts.** These match titles only. The patent series is small and includes many simulation and demonstration devices.

Data availability

The dataset (article sample, monthly and country tables, research and patent tables, all metrics) is released under CC BY-NC 4.0 with this paper. The sample holds 14,936 of 58,984 matched articles to 31 July 2026. Full article text, headlines, publishers, later articles and other topics are served by the Prism News API: <https://github.com/fliarbi/prism-news-api> (base URL <https://radar-api.fliarbi.com/news>). A worked query: `prism-news trends "tornado" -since 2019-01-01 --until 2026-07-31 --granularity monthly`.

References

1. Richard L. Thompson et al. (2012). Convective Modes for Significant Severe Thunderstorms in the Contiguous United States. Part II: Supercell and QLCS Tornado Environments. *Weather and Forecasting*. <https://doi.org/10.1175/waf-d-11-00116.1>
2. Mateusz Taszarek et al. (2020). Severe Convective Storms across Europe and the United States. Part II: ERA5 Environments Associated with Lightning, Large Hail, Severe Wind, and Tornadoes. *Journal of Climate*. <https://doi.org/10.1175/jcli-d-20-0346.1>
3. Joshua Wurman et al. (2012). The Second Verification of the Origins of Rotation in Tornadoes Experiment: VORTEX2. *Bulletin of the American Meteorological Society*.

<https://doi.org/10.1175/bams-d-11-00010.1>

4. Roger Edwards et al. (2013). Tornado Intensity Estimation: Past, Present, and Future. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/bams-d-11-00006.1>
5. Vittorio A. Gensini et al. (2018). Spatial trends in United States tornado frequency. *npj Climate and Atmospheric Science*. <https://doi.org/10.1038/s41612-018-0048-2>
6. Harold E. Brooks et al. (2014). Increased variability of tornado occurrence in the United States. *Science*. <https://doi.org/10.1126/science.1257460>
7. Pieter Groenemeijer et al. (2014). A Climatology of Tornadoes in Europe: Results from the European Severe Weather Database. *Monthly Weather Review*. <https://doi.org/10.1175/mwr-d-14-00107.1>
8. Jerald A. Brotzge et al. (2013). The Tornado Warning Process: A Review of Current Research, Challenges, and Opportunities. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/bams-d-12-00147.1>
9. Walker S. Ashley et al. (2015). Recipe for Disaster: How the Dynamic Ingredients of Risk and Exposure Are Changing the Tornado Disaster Landscape. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/bams-d-15-00150.1>
10. Fliar BI (2026). *Tornadoes in the News 2019–2026: article-level dataset and coverage tables*. Prism News API. <https://github.com/fliarbi/prism-news-api>