



2024 AI Integrated Business Report:

Key Weather Trends and
Recommendations



Table of Contents

Introduction & Snapshot of Key Threats	03
Leading Weather Threats Across Industries	04
Decoding Alert Terminology	05
Tracking Alert Severity Trends	06
Key Personnel Handling Alerts	07
Tracking Climate Impact Trajectory	08
Industry Deep Dives	
Rail	09
Energy	10
Air Freight	11
Construction	13
Technology	15
Transportation & Logistics	17
Airlines	19
Insurance	18
Manufacturing	21
State & Local Government	22
Weather & Climate Resilience for 2024	23

Already, 2024 has unleashed historically destructive weather and climate disasters - from California's crippling atmospheric rivers to Chile's unprecedented wildfires. As these extreme events underscore, communities and business operations globally face intensifying climate threats deviating further and further from prior norms.

Tomorrow.io analyzed over 25,000 weather intelligence alerts from 150+ global companies year-to-date, seeking insights into the biggest climate threats facing industries and some recommendations.

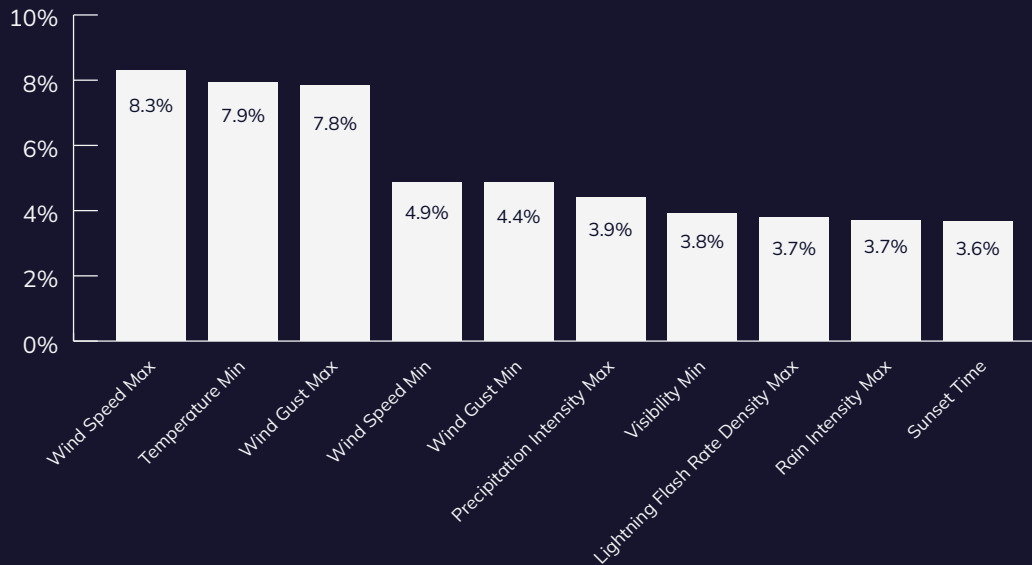
Key findings include:

- Alert volumes spiking 10x year-over-year - surpassing 29,000 alerts already in just 2024
- Wind alerts replacing winter factors as the #1 disruption overall, comprising over 8% of alerts
- High severity alerts jumped drastically as well, now accounting for 50% of alerts versus 33% last year
- Safety and Operations roles driving most weather alert handling
- Peak dates like February 8th see up to 10% of total alerts, signaling acute “disruption days”

By exploring global datasets around weather-driven business impacts industry-by-industry within this report, leaders obtain the insights required to forge systematic resilience - protecting margins and seizing opportunities competitors overlook.

Leading Weather Threats Across All Industries

Recent weather data reveals wind, temperature, and precipitation as driving the majority of business disruptions so far in 2024. By tracking leading disruption triggers, companies can build resilience capabilities protecting against intensifying climate threats.



Revenue Continuity Threats

With wind and storms causing 8%+ of alerts, delays, and unsafe conditions affected all industries. Key impacts include broad revenue loss from shutdowns, stranded assets, and reduced transactions.

Property and Inventory Exposures

Temperature swings also strain infrastructure resilience, heightening blackout and service loss risks. Extreme precipitation overwhelms drainage capabilities as well, flooding sites and jeopardizing inventory. Key impacts include extensive repair costs, inventory spoilage losses, and suboptimal infrastructure budgets struggling to meet climate volatility.

Supply Chain Bottlenecks

Extended rainfall blocks site access while interrupting upstream and downstream logistics flows. Organizations globally grapple with expenses from transport delays, emergency supplier contracts, and contingency capacities as climate disruptions magnify across integrated value chains. Key impacts include reduced productivity, diversion costs, and lost opportunities from climate-driven supply chain volatility.

Decoding Alert Terminology

Weather alert naming conventions thus far in 2024 reveal organizational priorities around assets requiring protection and the types of conditions deemed most concerning. Phrasing about extreme events and risk levels indicates key vulnerabilities, while terminology around procedures underscores tactical commitments.

Recent alert name examples expose several patterns:

Wind & Gale Warnings Signal Facility Protection Needs

Titles like "Extreme Wind Warning" and "Gale Warnings" indicate providers perceive wind and gust episodes as currently top risks to infrastructure, assets, and people.

Rain Alerts Symbolize a Focus on Continuity

Precipitation "Alerts" around flooding symbolize a priority on revenue continuity and maintaining uninterrupted business operations.

Risk Forecasts Prompt Proactive Precautions

Messages highlighting "Risks" of outages, supply chain disruptions, or equipment issues prompt stakeholders to take advanced precautions.

Top 10 Alert Names by Volume:

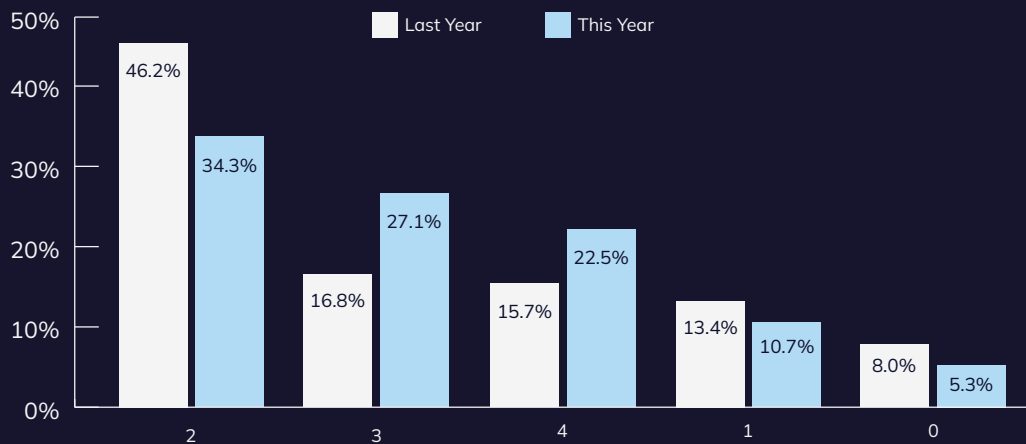
1. Monitor for Delay: Extreme Freeze Event
2. Delay Likely: Extreme Freeze Event
3. Notify Public of Possible Flooding
4. Breezy Winds, Respond to alert
5. Dry Weather Playbook
6. Outage Risk
7. Stop All Non-Essential Journeys For 1 Hour
8. Poor Visibility [Manual Operations Recommended]
9. Low Visibility - Ramp Shutdown
10. Monitor Road Temperatures

Tracking Alert Severity Trends

As climate change fuels more extreme weather events, analyzing alert severity levels over time reveals intensifying disruption potentials. By distinguishing low, medium, and high severity alerts, organizations quantify escalating risks - informing strategy and resilience.

Recent cross-sector severity findings include:

- Low-severity alerts dropped from 46% to 34% of total alerts
- Medium severity alerts climbed from 17% to 27%
- High severity alerts escalating from 16% to 23%



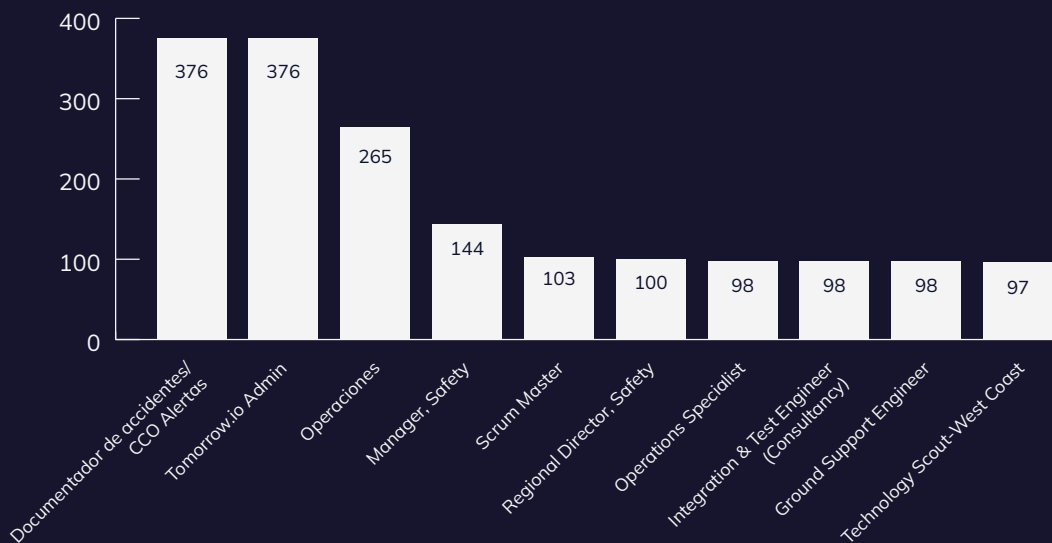
Year-over-year severity increases reflect growing medium and high-impact events like storms, floods, and temperature swings. As events once deemed extreme risks grow increasingly mainstream, adapting at scale with the most cutting-edge technology is critical.

Key Personnel Handling Alerts

Analyzing which roles and titles are actively triggering or handling weather alerts offers perspective on how companies facilitate internal visibility and response coordination around intensifying climate threats.

Findings from 2024 so far reveal:

- Safety managers generate the highest alert volumes (6% of total)
- Operations directors follow closely (5% of total alerts)
- Numerous other functions like IT, logistics, and customer service also actively monitor conditions



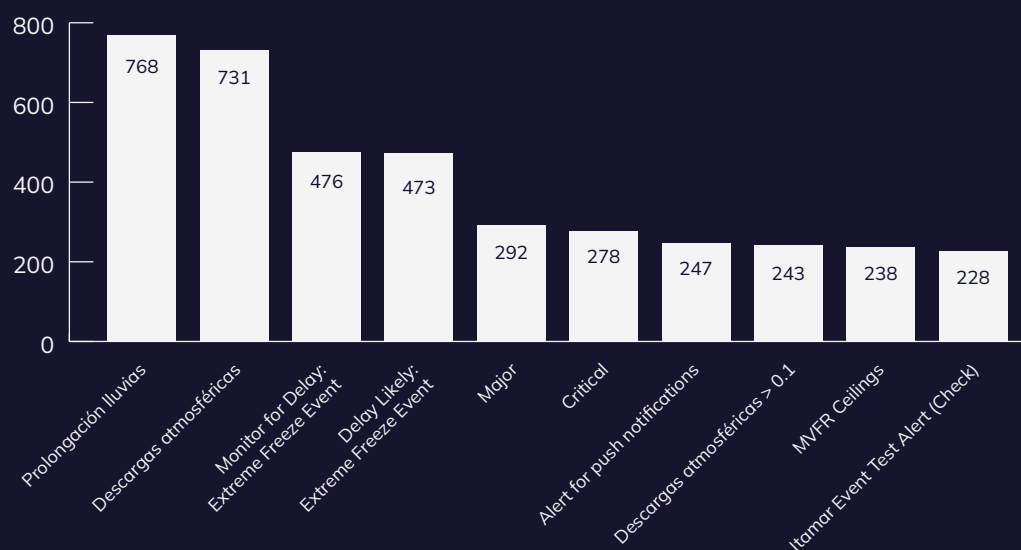
Frontline leaders such as safety managers and operations heads are responsible for handling weather alerts at the localized level. This approach allows for a contextualization of the broader business impacts and enables field perspectives to inform infrastructure planning.

Tracking Climate Impact Trajectory

Analyzing weather alert volumes over time offers a vital perspective on the intensification of climate threats and how proactively companies monitor conditions.

Recent year-over-year findings include:

- A 10x increase in total alerts, exceeding 15,000 in 2024 already versus under 1,500 last year
- Specific dates see acute activity like February 8th driving nearly 10% of alerts



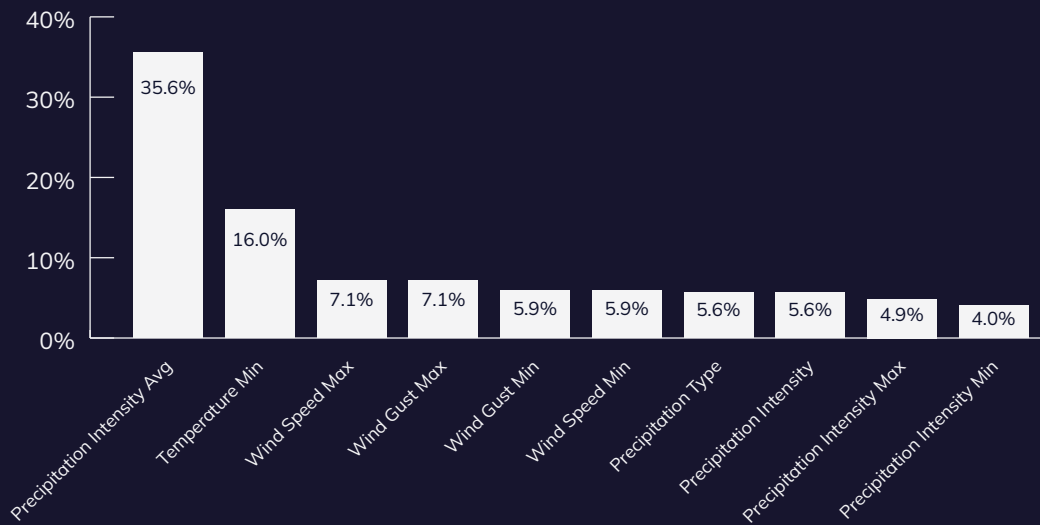
Rapidly rising alert numbers reveal increasing climate impact trajectory along with maturing business contingency efforts. But extreme outlier dates suggest certain recurrent seasonal factors still yield oversized impacts requiring preparation.

While swelling alert volumes indicate widening business climate resilience investments, extreme activity days spotlight lingering acute disruption risks requiring failsafe protocols across industries globally. Ultimately, analytics identifying the recurrence of specific seasonal threats empowers organizations to get out ahead rather than simply react.

Rail Weather Disruption Spotlight

Key Business Impact Insights:

- **Service Suspensions:** Heavy precipitation caused over 35% of alerts, indicating flooding risks disrupting scheduling
- **Slowed Operations:** Temperature swings forced speed restrictions on over 15% of days
- **Heightened Contingency Costs:** January and February saw concentrated peaks in high-severity alerts



With heavy rainfall driving over 35% of recent rail alerts, flooding frequently suspends services - severely hampering scheduling and revenue. Temperature variability also triggered speed restrictions on over 15% of days to mitigate buckling threats and avoid injuries. These acute seasonal events necessitated major contingency efforts.

How Weather Intelligence Can Help Railways

Tomorrow.io's precision predictions empower rail leaders to pinpoint risks further ahead:

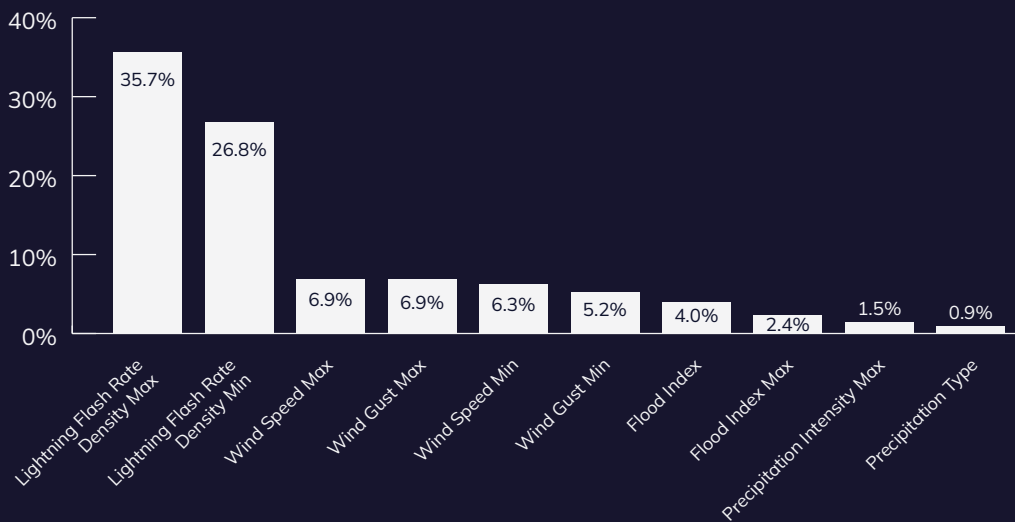
- Flood forecasting identifies at-risk assets preemptively
- Enhanced lead times support orderly pre-event preparations
- Predictive scheduling adjustments protect cargo/passenger commitments

By leveraging heightened visibility into increasing climate threats across assets, railways can dramatically improve service resilience - optimizing continuity and safety outcomes.

Energy Sector Weather Impact Spotlight

Key Business Impact Insights:

- **Grid Reliability:** Lightning and wind disrupted transmission infrastructure safely
- **Cost Pressures:** Severe weather drove extensive equipment repairs and replacements
- **Workforce Safety:** Extreme storms and volatility necessitated heavy contingency response



With lightning driving over 35% of recent energy alerts and wind turbulence damaging assets, grid infrastructure safety and reliability feel acute disruption pressures. These mounting severe weather threats also endanger workforce safety, while more extreme seasonal electricity demand spikes strain budgets through inflated asset repair/replacement costs.

How Weather Intelligence Can Help:

Tomorrow.io's precision predictions equip utilities to navigate mounting climate threats:

- Lightning detection protects transmission infrastructure integrity
- Shear/gust outlooks facilitate orderly grid contingency preparations
- Outage analytics support accelerated response optimization

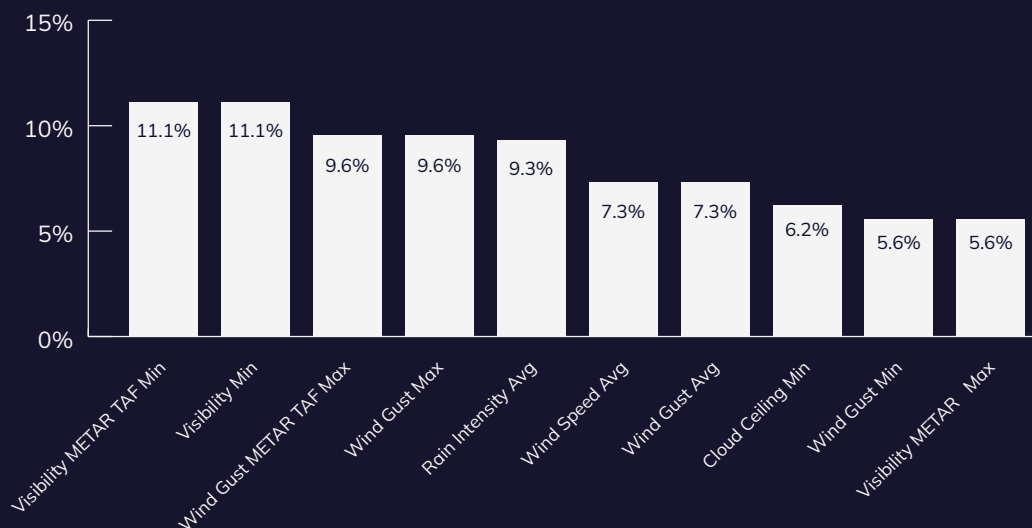
By leveraging weather intelligence to anticipate intensifying risks more granularly across the energy grid, utilities improve safety and cost outcomes simultaneously - optimizing system resilience.

Air Freight Weather Disruption Spotlight

From event delays to unsafe conditions, weather can significantly impact sports events. Identifying and preparing for these threats is key to maintaining schedules and fan safety in an evolving climate.

Key Business Impact Insights:

- **Cascading Operational Failures:** Low visibility events severely disrupted airport and ATC continuity, causing cascading flight delays and cancellations
- **Increased Passenger Frustration:** High-severity wind and visibility alerts impacted over 50% of flights, resulting in substantial passenger inconvenience
- **Reliability & Satisfaction Risk:** Over half of alerts classify at severity level 3 or 4, pointing to heightened delay and cancellation risks system-wide



With low visibility driving over 22% of recent air freight alerts, reduced visibility leads to significant airport capacity reduction and ATC coordination challenges. Additionally, nearly 19% of alerts were tied to turbulent winds, restricting safe aircraft ramp handling and takeoff/landing operations. Over half of alerts classify at severity level 3 or 4, pointing to heightened passenger delay and cancellation risks system-wide.

How Weather Intelligence Can Help:

Tomorrow.io's weather insights allow airlines and airports to get ahead of disruption risks:

- Precision visibility detection enables proactive flight and staff rescheduling to minimize passenger impact
- Shear/gust outlooks facilitate orderly ground operation contingency management
- Outage prediction analytics support accelerated alert response and coordination

By leveraging forecast visibility into intensifying climate threats, aviation stakeholders can dramatically improve operational resilience - optimizing safety and reliability outcomes amidst increasing air traffic density.

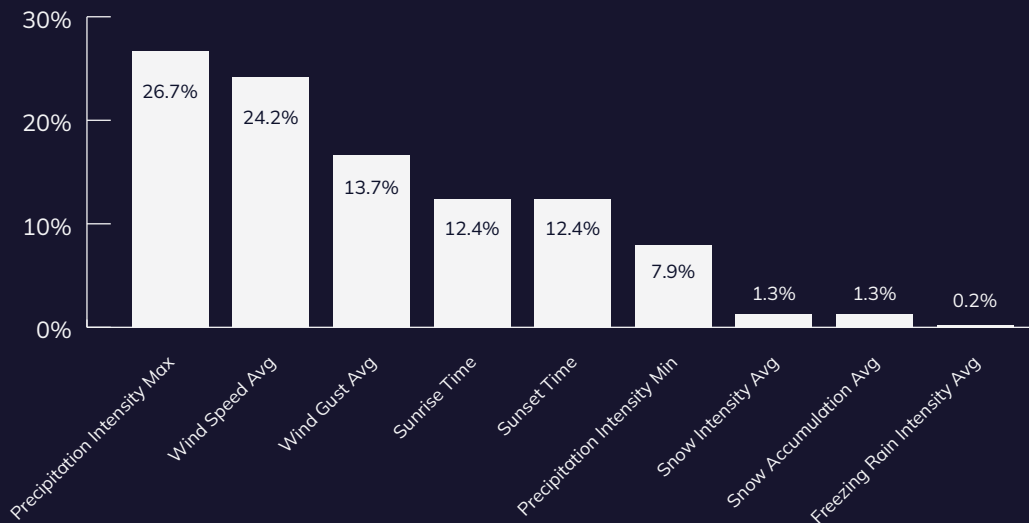


Construction Weather Disruption Spotlight

Crop and livestock operations are intrinsically tied to weather patterns and events. Monitoring conditions closely enables growers to anticipate challenges, adapt practices, and protect crops and animals from climate threats.

Key Business Impact Insights:

- **Extended Project Timelines:** Heavy rainfall and flooding limited site access over 41% of days, hampering construction progress
- **Slowed Activity:** Snow accumulation necessitated work stoppages nearly 2.5% of days, slowing project timelines
- **Persistent Delays:** Sporadic heavy rainfall caused over 15% of peak day alerts – driving persistent progress delays



With heavy rainfall driving over 40% of recent construction alerts, flooding severely limits site access and equipment mobilization - hampering activity. Additionally, winter snow accumulation brings complete work stoppages nearly 2.5% of days. While most alerts hit level 2, almost 20% escalate to level 3 – underscoring the major financial impact of weather delays.

How Weather Intelligence Can Help:

Tomorrow.io's weather intelligence enable construction firms to mitigate intensifying disruption risks:

- Precise precipitation predictions empower proactive project scheduling
- Snowfall outlooks inform contingency crew allocation
- Flood forecasting supports accelerated protection response

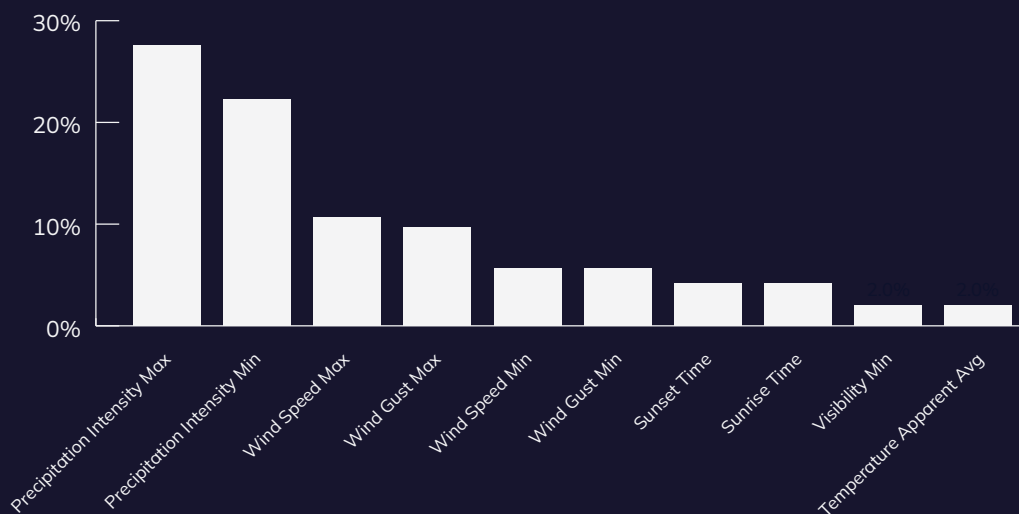
By leveraging heightened visibility into increasing climate threats, construction companies can dramatically improve project timelines and budget resilience - optimizing productivity amidst rising completion pressure.



Tech Weather Disruption Spotlight

Key Business Impact Insights:

- **Data Center Disruption:** Cloud cover drove 13% of alerts, indicating potential solar generation loss and connectivity impacts
- **Facility Access Issues:** Visibility and high winds restricted access nearly 11% each, delaying operations teams
- **Sporadic Outages:** Over 25% of peak alerts reached level 3 severity, underscoring infrastructure vulnerability



With cloud cover triggering over 13% of recent tech alerts, fluctuating solar generation from data centers poses energy management and uptime challenges. Additionally, nearly 11% of alerts reflected storms limiting facility and infrastructure access. While most alerts classify as level 2, over a quarter escalate to level 3 - highlighting infrastructure sensitivity to electrical storms.

How Weather Intelligence Can Help:

Tomorrow.io's forecasts enable tech firms to circumvent intensifying disruption risks:

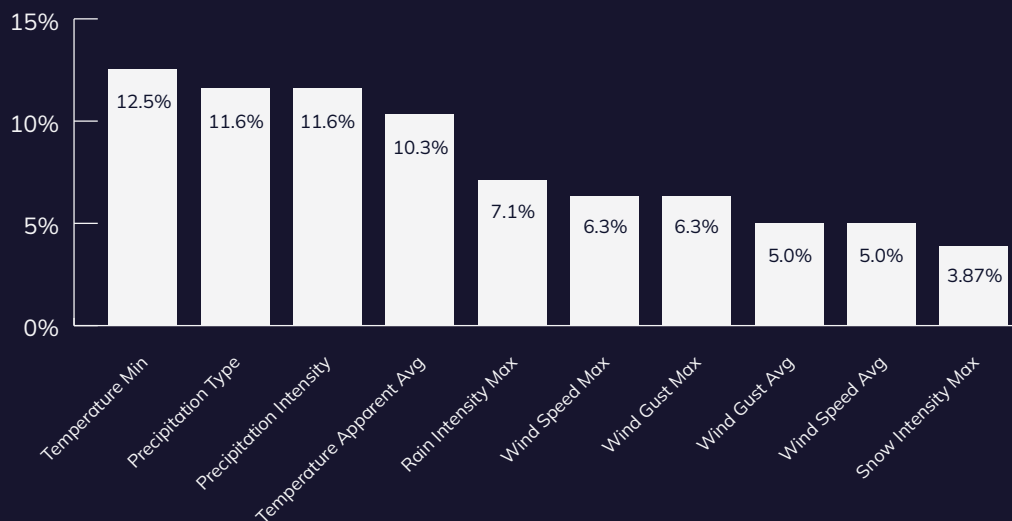
- Solar irradiation insights optimize renewable energy management
- Severe weather notifications facilitate orderly contingency staff planning
- Lightning strike analytics empower infrastructure reinforcement response

By leveraging precision visibility into mounting climate threats, tech companies can vastly improve operational resilience –optimizing safety and reliability outcomes.

Transportation & Logistics Weather Disruption Spotlight

Key Business Impact Insights:

- **Supply Chain Volatility:** Low visibility triggered 42% of alerts, disrupting transport capacity and facility continuity
- **Equipment Failures:** Heavy rainfall caused over 8% of alerts, highlighting flooding equipment damage risks
- **Margin & Inventory Impacts:** Nearly 20% of level 3 severity alerts underscore consistent revenue, margin and inventory delay risks amid shipping volatility



With low visibility driving 42% of recent transportation alerts, storms, fog and blizzards severely reduce airport, seaport and ground transport capacity - hampering cargo movement. Additionally, heavy rainfall damaged infrastructure over 8% of days. While most alerts remain level 2, almost 20% escalate to level 3 – pointing to the severe economic impact of weather-driven cargo and equipment damage delays.



How Weather Intelligence Can Help:

Tomorrow.io's forecasts enable logistics firms to circumvent intensifying disruption risks:

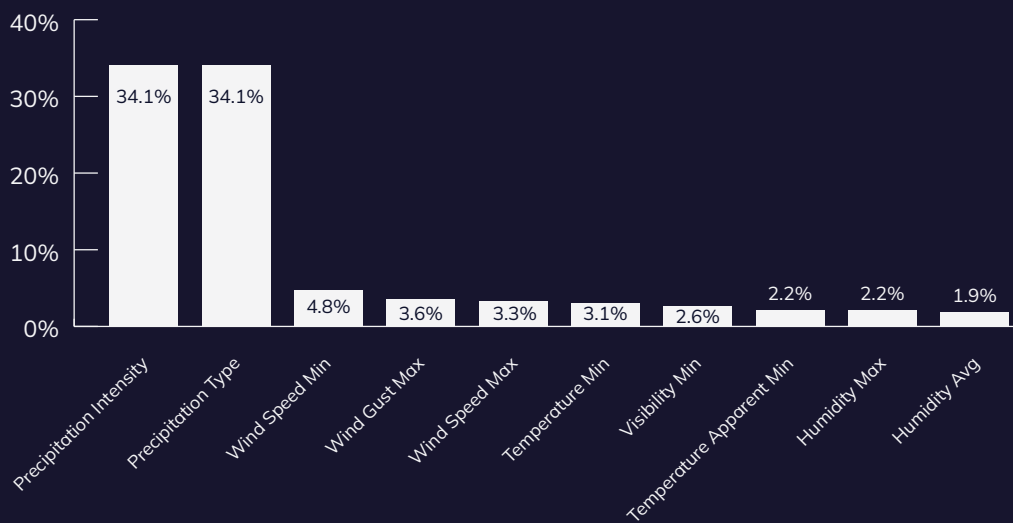
- Storm outage predictions facilitate orderly cargo rerouting and contingency planning
- Visibility analytics empower efficient staff allocation amid closures
- Flood forecasts support accelerated infrastructure reinforcement and inventory protection

By leveraging precision visibility into mounting climate threats, transport companies can dramatically improve shipping resilience – optimizing safety and reliability outcomes.

Aviation

Key Business Impact Insights:

- **Airport Closures & Flight Delays:** Visibility reductions accounting for 30% of alerts indicate potential for widespread airport closures and delays from storms and dense fog.
- **Flight Safety Risks:** Wind alerts making up 19% highlight turbulence, crosswind and other impacts that compromise flight continuity and passenger safety.
- **Severely Disruptive Events:** Over 33% of alerts reaching severity 3 or 4 underscore outsized impacts warranting urgent response.



The data reveals the year-round threats to aviation from storms, dense fog, and high winds – requiring predictive forecasting so airlines can get ahead of events and inform proactive scheduling.

How Weather Intelligence Can Help Airlines:

By leveraging precise predictive analytics, airlines can implement proactive safeguards:

- Hyperlocal visibility forecasts enable airlines to halt airport operations based on expected visibility reductions from fog or thunderstorms.
- Turbulence detection helps pilots steer clear of rough air and respond to clear air turbulence reports.

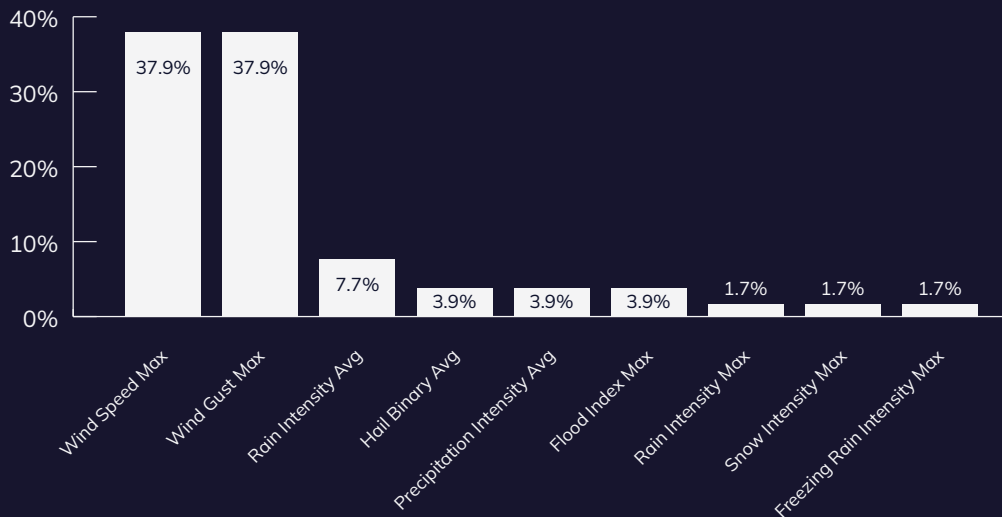
Proactive weather intelligence is key for airlines seeking to deliver safe, efficient, and reliable air travel regardless of intensifying climate volatility.



Insurance Severe Weather Risk Spotlight

Key Business Impact Insights:

- **Claim Volatility:** Wind alerts drove over 75% of days, indicating severe storm damage payout surges
- **Financial Swings:** High severity alerts dominated at 93% of events, causing earnings fluctuation
- **Acute Storm Days:** 37% of alerts hit on a single January day, highlighting seasonal risk



With wind alerts triggering over 75% of recent insurance alerts, storms, hurricanes and tornado outbreaks drive spikes in property damage claims. Additionally, 93% of alerts ranked at high severity levels 3 and 4 – pointing to major financial impacts from weather destruction.

How Weather Intelligence Can Help Insurers:

Tomorrow.io's forecasts enable insurers to navigate intensifying climate risks:

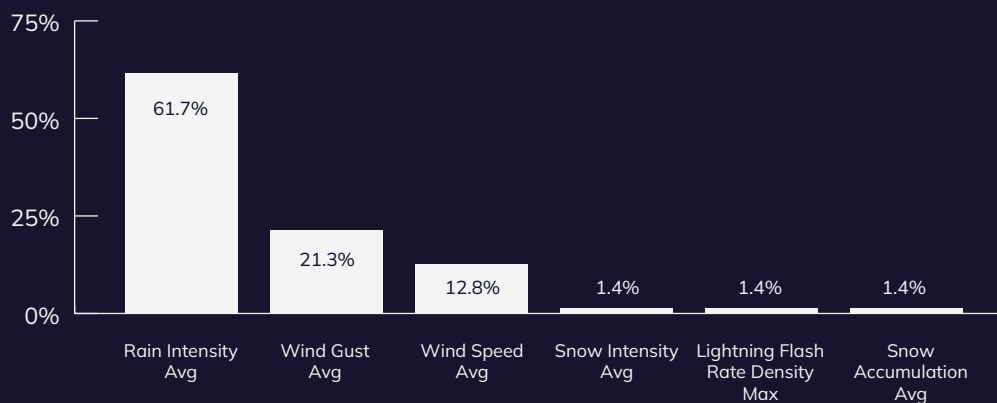
- Storm track visualization supports early policyholder outreach
- Wind/flood modeling informs risk exposure optimization
- Hyperlocal forecasts aids accurate premium setting

By leveraging precision visibility into weather volatility, insurers can stabilize earnings – improving customer trust and long-term competitiveness.

Manufacturing Winter Weather Disruption Spotlight

Key Business Impact Insights:

- **Site Access Limits:** Heavy precipitation caused over 37% of alerts, restricting facility access
- **Inventory & Logistics Disruptions:** Over 90% of high-severity alerts occurred in 2 days, halting parts and product shipments
- **Acute Concentration Risk:** 92% of alerts hit on one crippling January day highlighting outage vulnerability



With heavy precipitation driving 37% of recent manufacturing alerts, flooding and storms severely hamper plant access and inventory logistics. Additionally, over 90% of high severity alerts spanned just two winter days - underscoring plant volatility.

How Weather Intelligence Can Help Insurers:

Tomorrow.io's forecasts enable factories to navigate mounting threats:

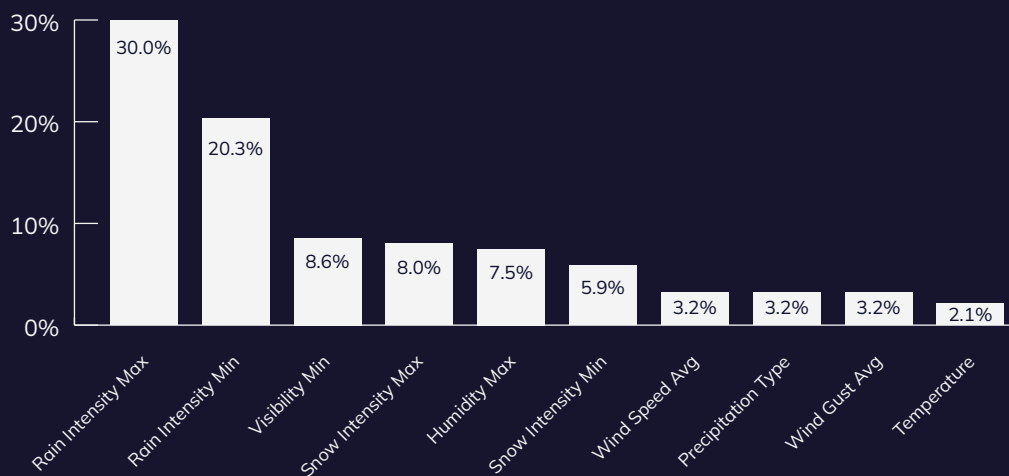
- Precise precipitation predictions inform orderly shutdown planning
- Flood forecasting supports supply chain contingency rerouting
- Outage analytics empower workforce allocation amid disruptions

By leveraging precision visibility into intensifying climate threats, manufacturers can dramatically improve plant resilience – optimizing continuity despite acute seasonal concentration risks.

State & Local Government Weather Disruption Spotlight

Key Business Impact Insights:

- **Transport Budget Strains:** Heavy precipitation caused 34% of alerts, indicating potential road/transit repair costs
- **Workforce Productivity Losses:** Low visibility restricted facility access over 11% of days
- **Constituent Service Failures:** 21% of high severity alerts occurred in one day, risking utility failure response breakdowns



With heavy rainfall driving 34% of recent state and local government alerts, flooding poses high risk of transport infrastructure damage - necessitating unplanned infrastructure investments. Additionally, 11% of storm alerts hampered government operations and workforce productivity. Concentrated high-severity events point to acute climate challenges outpacing government response capacity.

How Weather Intelligence Can Help Governments:

Tomorrow.io's forecasts enable agencies to circumvent intensifying threats:

- Flood forecasting guides strategic infrastructure planning
- Winter weather protocols maintain workforce continuity
- Utility grid analytics prevent constituent service failures

leveraging precision visibility into mounting climate threats, states and localities can dramatically improve civic resilience – optimizing continuity and emergency response capabilities vital for public services.

Weather & Climate Resilience for 2024

With weather alerts already exceeding 29,000 in just the early weeks of 2024, each day brings mounting risks of extreme storms, flooding, and temperature swings hampering business operations. As climate volatility outpaces historical norms, firms that fail to adapt will struggle to protect margins, assets, and customer commitments.

Ultimately, the data spotlights a new imperative: systematically integrate predictive weather intelligence to drive organizational resilience. By leveraging Tomorrow.io's capabilities, teams across every function gain the visibility to circumvent outsized climate impacts — while seizing new opportunities competitors will overlook.

Request a demo today to experience these industry-leading weather and climate analytics firsthand.

About Tomorrow.io

Tomorrow.io is the world's leading weather intelligence and climate adaptation platform. Supercharged by next-generation space technology, cutting-edge generative AI, and proprietary modeling capabilities, global leaders including JetBlue, Fox Sports, The United States Air Force, Ford, and Uber rely on Tomorrow.io to solve their weather and climate-related challenges. From innovative early warning systems to actionable insights, organizations can predict impact, mitigate risk, and ensure operational resilience with Tomorrow.io. Join the weather intelligence revolution at www.tomorrow.io.