



How Manufacturers Can Optimize

Operations with Weather Intelligence

Worker Safety | Competitive Differentiation | Supply Chain | Continuity

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Introduction

The manufacturing industry is finally getting its legs back under itself after four years of relentless COVID, climate, and conflict challenges. This isn't a return to business as usual, though. It's a new ballgame in many ways, and the teams without an updated playbook are set to lose big.

The balance of power has changed with regard to workforce management, and the supply chain is more of a mixer than a ball. That means two of the pillars of operational continuity remain quite fragile, even as a new vision for manufacturing starts to take shape. And in spite of all that, customer expectations are growing, as is their willingness to switch suppliers.

This book is designed to help operations leaders in the manufacturing space overcome those challenges by shifting their strategic and technological approach to weather operations. Moving forward, we'll explore:

1

Why weather and environmental resilience are crucial to the new manufacturing climate

2

How situational environmental awareness protects products & profits from disaster

3

How hyperlocal and global weather intelligence build flexibility and protect productivity

4

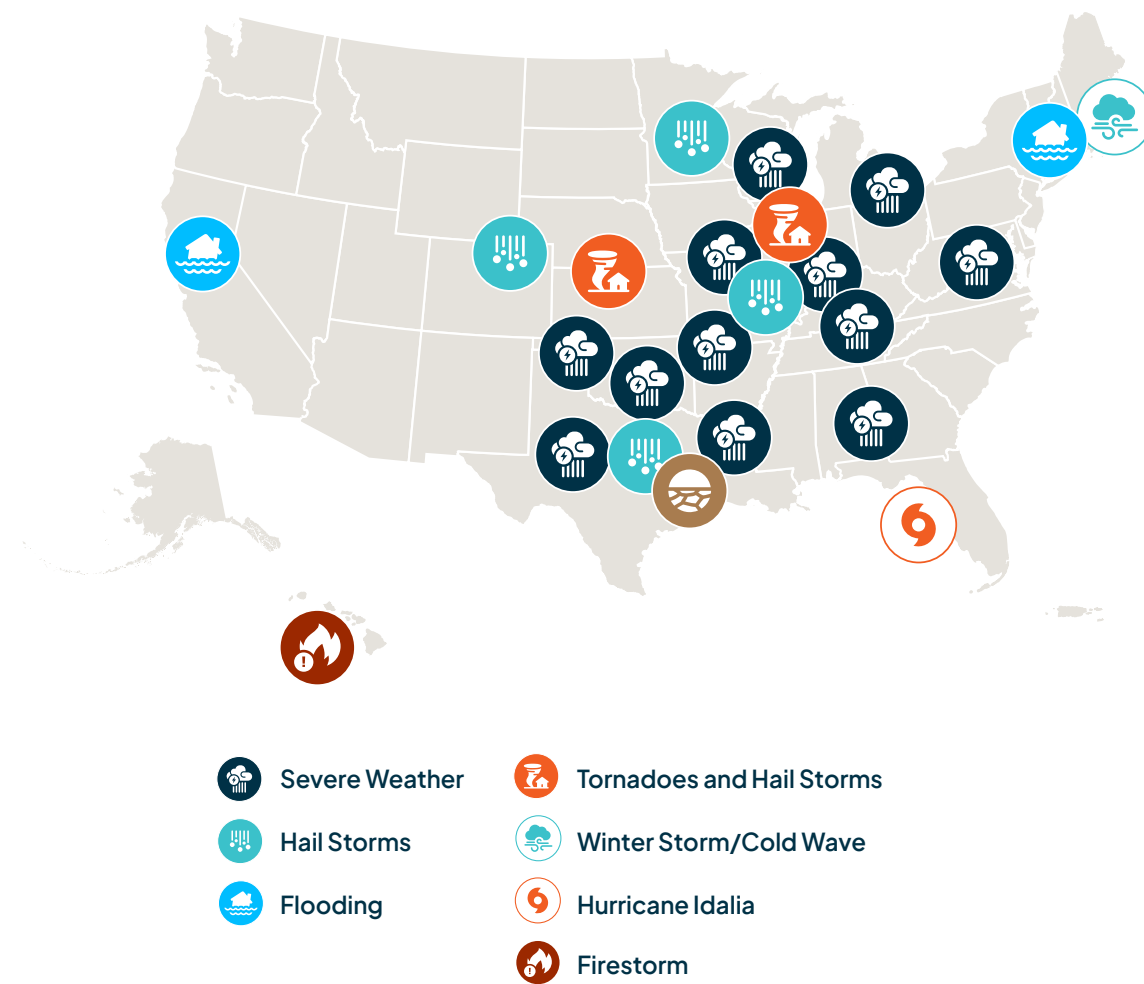
How investments in weather safety can provide a differentiator in a competitive labor market



How severe weather is targeting the manufacturing business

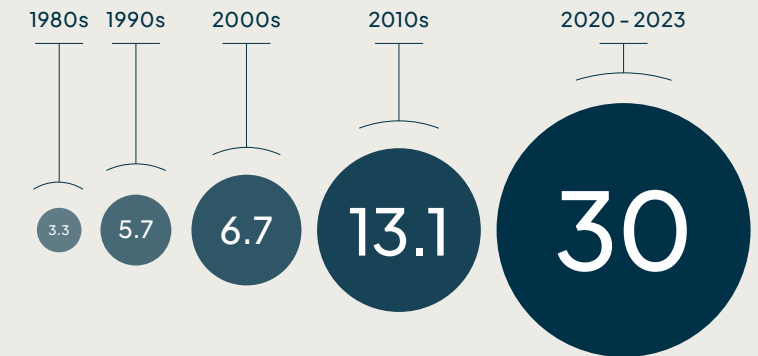
Major weather events have been earning headlines consistently the past few years for damaging communities and disrupting economic continuity. For manufacturers, these weather disasters create both business and human challenges, impacting workforce stability, potentially damaging key business infrastructure, and wreaking havoc on the supply chain.

As of October 10, 2023, there have already been **24 confirmed weather or climate events** with an economic impact of greater than **\$1 billion** in the U.S. alone this year. While laypeople often assume these impactful events are clustered in coastal areas, that's actually false. As the map illustrates, most of this year's severe weather events have been inland storms in the parts of America where manufacturing and supply chain businesses are among the most important employers.



At a glance...

Billion-dollar weather events on average per year:



Source: National Center for Environmental Information



65% of the American workforce is concerned about severe weather events while they're at work

Source: Facility Executive

Workforce safety: a responsibility & a differentiation opportunity

Given that **65% of the workforce is worried about a severe weather** event striking while they're at work, employers need to recognize that weather safety is a workforce investment as much as an operational or compliance-driven one.

The two outdoor spaces where weather can create the most risk for employees in the manufacturing space are the loading dock and the yard. Workers in the yard are

often out in the open, operating machinery and transporting or touching large metal objects. That's a recipe for attracting lightning.

Similarly, workers at the dock use large carts, lifts, and ramps that can be made of conductive material. Strong winds at key moments can make either job incredibly unsafe.

While those workers have eyes that can see storms rolling in and cell phones with weather apps on them, they still need guidance from a trustworthy and authoritative source on how and when to react.

That's where some manufacturers are starting to embrace a semi-automated system that keeps everybody safe while delivering a ton of value to workers and operations leaders alike.

Here's how innovative manufacturers are doing it:

1

A storm with the potential to create dangerous conditions approaches your area

2

Employees working outside get an alert while there's still time to store equipment and seek shelter

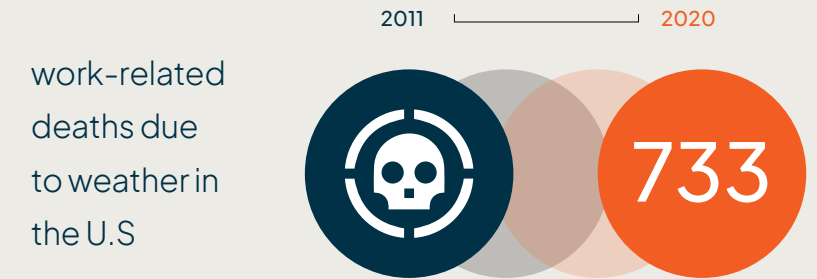
3

Your employees, equipment, and products stay safe

4

Employees get an automated all-clear as soon as it's safe to resume work

At a glance...



Source: BLS



of employees in the manufacturing industry are dissatisfied with their employer's safety program

Source: Manufacturing Institute



of employees in the manufacturing industry are dissatisfied with their employer's communication practices

Source: Manufacturing Institute

Seeing weather safety as an investment in talent retention and development

Attracting and retaining great talent is one of the manufacturing space's biggest current challenges. Mass retirements and a slow trickle of new talent have made qualified workers more empowered and transitory than before. Wages are up, as are benefit offerings, sign-on bonuses, and other perks.

Any quality-of-life improvement an employer can offer to prospective workers in this market is crucial. Weather safety is underrated and underappreciated as a promotable value that manufacturers can deliver to their employees in the yard or at the loading dock.

If workers don't have **timely information about dangerous weather** headed their way and how to react, it creates a climate of uncertainty in which great productivity isn't possible and employees feel disconnected from operational leaders in ways that damage culture and retention. At the same time, employees aren't just workers; they're people, and if a major weather or climate event is headed their way, they also need to be able to make the right decisions for their families.

In this way, weather safety provides incredible two-way value for both the employer and employee in these scenarios.

Food for thought...



90% of manufacturers have upped compensation and incentives to attract and retain talent

Source: Manufacturing Institute



42% of manufacturers say labor scarcity is a top-three challenge in 2023

Source: Alithya



46% of employees say safety is a priority when assessing whether or not to stay with their employer

Source: AlertMedia



Protecting productivity & process integrity

At the end of the day, manufacturing is about making quality products in a consistent, efficient manner. Industry surveys show that, in this climate of workforce and supply chain instability, many manufacturers are focusing their innovation efforts on finding new ways to maintain efficiency and productivity. Every moment in an operational production facility with adequate staffing is precious.

That's why it's more important than ever to keep the lights on. When the power goes out at a manufacturing facility, it brings operations to a grinding halt, potentially damaging or ruining in-process products and necessitating hours of maintenance for a full reset –

and that process can only begin once power is restored. Now, most production facilities have on-site generation capabilities, but timing the use of generators is key. Turn the generator on too early and burn money. Turn the generator on a second too late, and the process has already been fouled.

According to the Department of Energy, severe weather events like **thunderstorms, hurricanes, and blizzards have caused 58% of all power failures since 2002**, and a striking 80% of outages affecting more than 50,000 customers. That makes severe weather a huge threat to the manufacturing industry's innovation goals.



Food for thought...



of businesses say downtime costs them at least \$300,000 per hour

Source: ITIC



of manufacturers' top innovation priority is improving processes to increase productivity

Source: Alithya



of manufacturers' top innovation priority is improving operations to become more efficient

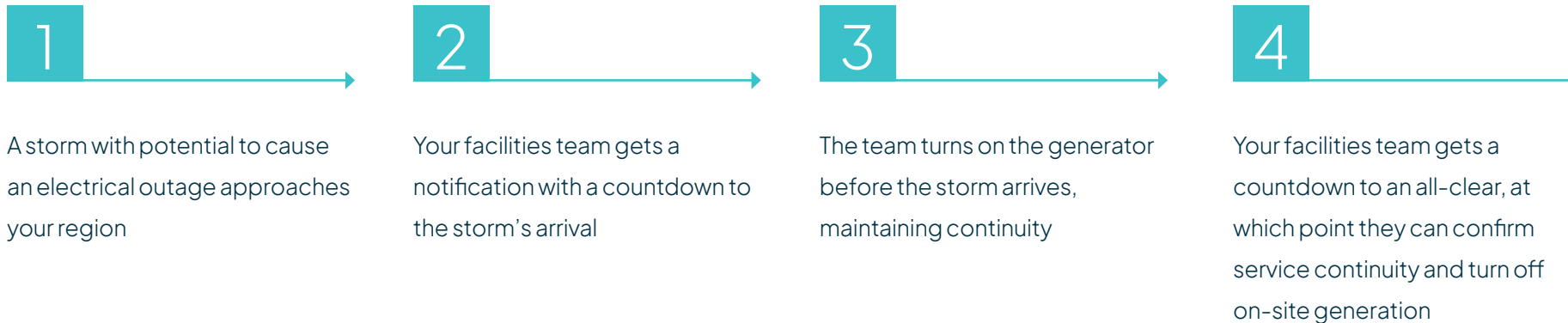
Source: Alithya

Weather intelligence as an investment in operational continuity

The best way to avoid costly power outages during severe weather events without overspending is simply to start on-site generation at the right moment. The generators must be up and running before a storm enters the geographic danger zone where it could knock out power.

Those **decisions simply cannot be made using a traditional publicly available forecast** (because it isn't specific or granular enough) or information from a regional weather service (because they're focused on big-picture community safety). **Manufacturers need reliable, high-accuracy intel** for their specific location in order to lead that **"just-right"** response that maintains productivity and process integrity to the highest degree possible without hurting profitability by burning unnecessary fuel.

Here's how innovative manufacturers are doing it:



Food for thought...



of all industrial sector energy use occurs in manufacturing

Source: Alithya



of all manufacturing electricity use in 2018 was sourced onsite

Source: Alithya



of electricity for manufacturing is generated using natural gas, which is rising in price

Source: ITIC

Supply chain: time to reclaim agility & transparency

There have already been entire books written about what's happened to the supply chain the last few years, but to make a long story short, a system that had started to feel pretty seamless almost completely fell apart. While there's been a major bounce back in the last year, today's supply chain still doesn't have the reliability and predictability of the pre-COVID days.

For that reason, it's easy for manufacturing leaders – both on the business and operations teams – to feel nervous about their long-term stability. When materials arrive late or orders are incomplete, it can significantly damage productivity and

profitability. That's why **the next step in the industry's recovery is to eliminate the opaqueness of the supply chain,** and weather intelligence is a major part of that.

While COVID gets much of the credit for what's become of the supply chain, **climate variability and the increase in severe weather events also play crucial roles.** Many global shipping companies are in coastal regions where flooding is becoming more frequent. More powerful and less predictable storms at sea are disrupting traditional shipping routes. Road weather events on main trucking routes are having a bigger impact than ever.



At a glance...



of supply chain leaders agree pre-COVID management strategies need to be revised

Source: McKinsey & Company



of supply chain leaders are prioritizing supply chain visibility

Source: McKinsey & Company



of supply chain leaders are prioritizing implementing supply chain planning tools

Source: McKinsey & Company

Using weather intelligence to anticipate supply chain challenges

Weather intelligence can't "fix" the underlying problems of the supply chain, but it can provide manufacturers with a more complete understanding of what's going on around the world in real time. When operations and business leaders can actually **visualize weather systems around their shipping routes**, it cuts through the fog of uncertainty and provides a clear picture of what's going on.

That visibility enables informed business decisions for the entire operation – from potentially adjusting the production schedule to rerouting outbound trucks – while also helping manufacturers assess their suppliers' approach to the challenges of the space. In this way, weather intelligence empowers manufacturers with the **360-degree view of the supply chain** that many feel has been lost.

Here's how innovative manufacturers are doing it:

1

You get forecasts and real-time maps for weather conditions around the world

2

Your team visualizes impacts on shipping or supply routes to recognize potential delays or disruptions

3

Your operations leaders gain strategic time to seek alternative sourcing or adjust the production schedule

4

Your facility continues to produce products and make the best possible use of time based on the factors within your control

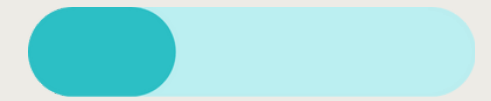
Food for thought...

\$84 trillion

estimated economic impact of El Niño weather this century

Source: Science

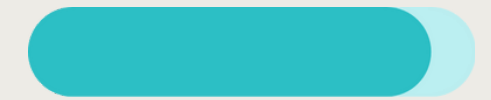
33%



of key supply chain sites in the U.S. are in areas of major climate variability

Source: Harvard Business Review

80%



of U.S. supply chain businesses have no severe weather continuity plan

Source: Harvard Business Review

Next steps: making it real

Weather intelligence has so much to offer manufacturers, especially given the current climate of increased supply chain and workforce challenges against the backdrop of productivity expectations. While the recommendations above provide a few specific examples of how emerging weather tech can address many of the industry's emerging needs, there's really much more to the story.

AEM specializes in helping manufacturers of all sizes and types adapt their weather safety approach to meet today's growing challenges while also uncovering unique opportunities to **turn weather data into business intelligence**. We've helped companies keep their workers safer than ever from lightning and heat, enabled operations teams with productivity-boosting insights, and demystified business continuity in the face of growing severe weather threats and a less-stable supply chain.

If you're interested in learning more about how leading manufacturers are already using weather technology and services to their greatest possible effect or what a bite-sized first step might look like for your organization, we hope you'll reach out to us to initiate an individualized conversation. In that initial chat, we'll get to know you and your exact situation so we can provide you with precisely the information you need to take the next step forward.

Meet the authors



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Partnering with organizations in manufacturing, construction, and energy to reduce risk and improve performance. He works closely with customers to align AEM solutions with operational goals, helping teams enhance safety, minimize downtime, and make more informed, data-driven decisions.

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