



AEM's 2024 End-of-Year Weather Resilience Report

Looking Back & Thinking Forward

Quantifying severe weather's impact and our communities' ability to improve outcomes

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Executive summary

According to the National Oceanic and Atmospheric Administration’s ongoing study of billion-dollar weather and climate disasters, major severe weather events had an impact of over \$61 billion in the United States alone during the first ten months of 2024. If that number isn’t scary enough, consider that it’s also an under-count of the full scale of the problem because it only considers events with an impact of at least \$1 billion.

While the undeniable financial impacts of severe weather are growing, the human side of the problem sometimes gets lost in the shock and awe of science and economics. There’s a growing need to understand not just how weather impacts a country or a region but how it affects a community – a collection of inextricably interconnected stakeholders who all experience things slightly different and have their own drivers. That means talking more about how severe weather presents at ground level and how a single event is felt in many different ways.

To help facilitate that conversation in our role as the world’s essential source for environmental insights, AEM conducted a survey during the autumn of 2024 to profile severe weather’s impact throughout the year and benchmark what various community stakeholders are anticipating in 2025. Questions focused on different types of weather respondents experienced, what measurable impacts weather had if any, their degree of satisfaction with leadership during weather events, expectations for next year, and budget to improve weather resilience in 2025.

Survey respondents included:



153 business operations professionals focused on how to maintain continuity and keep people safe in the face of severe weather



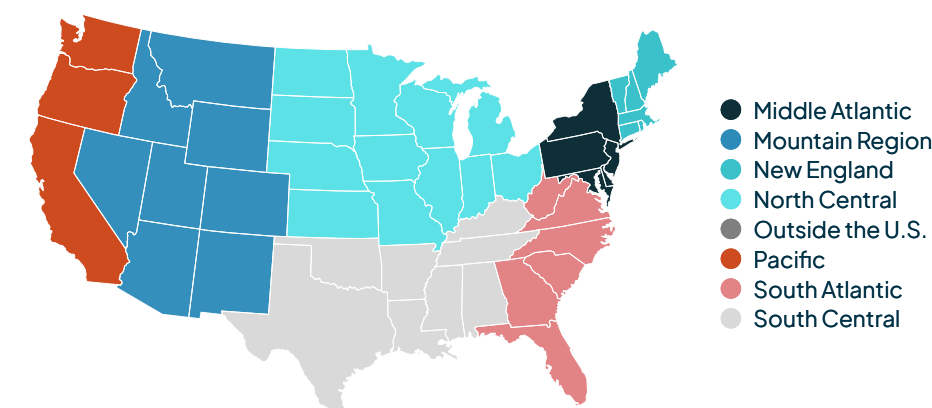
96 local governments and agencies responsible for public safety or water management in the face of severe weather



1,357 individuals/citizens interested in the weather and translating weather knowledge into a better life

Responses were spread out in a way that provided representative samples for every region of the United States as well as a healthy response group outside the U.S.

- **Middle Atlantic: 168**
- **Mountain: 172**
- **New England: 95**
- **North Central: 239**
- **Pacific: 245**
- **South Atlantic: 199**
- **South Central: 186**
- **Outside the U.S.: 302**

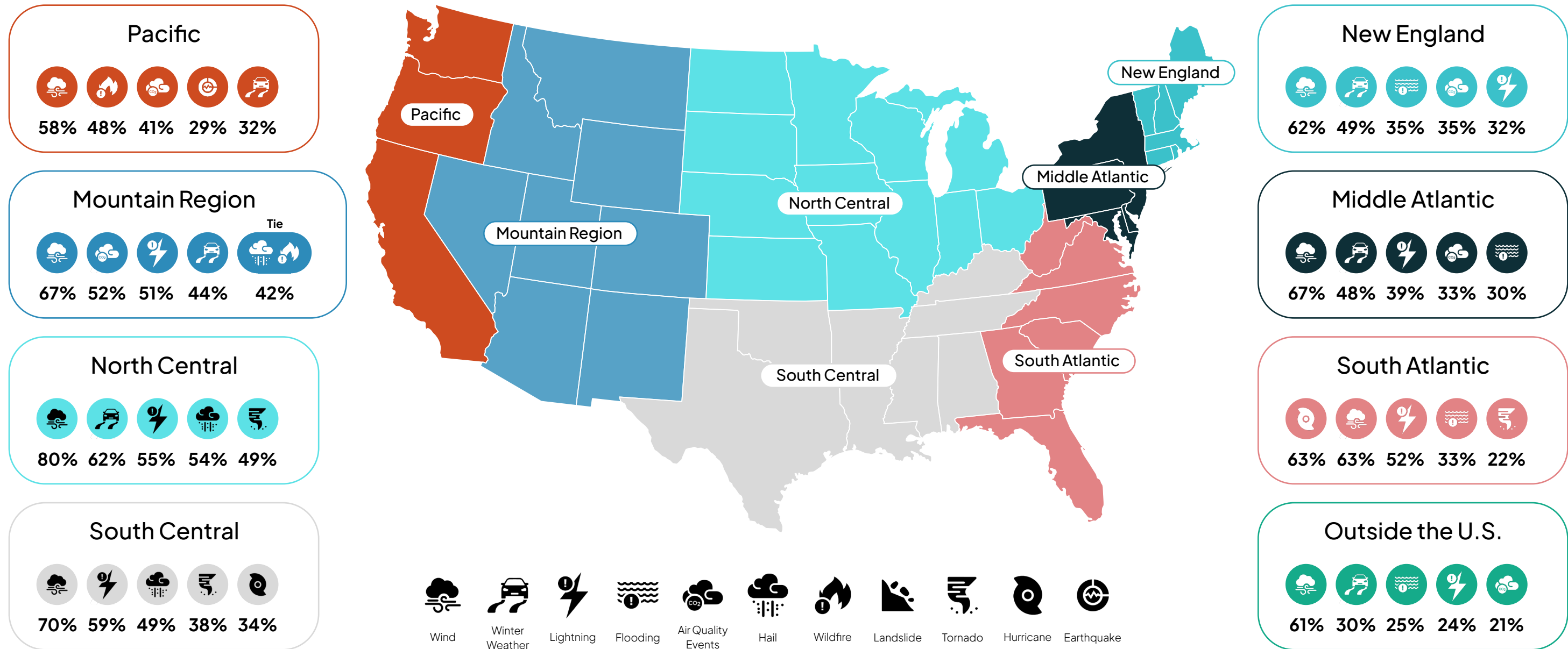


Generally, the survey uncovered that severe weather had a major impact on communities across the U.S. and world in 2024. Over 73% of all respondents reported that weather impacted their ability to conduct “business as usual” on at least one day during the year. 8% said they were disrupted on more than ten days. Furthermore, 60% of governments, 48% of businesses, and 13% of individuals reported experiencing measurable financial impacts due to severe weather.

Looking Back: How severe weather impacted the U.S. & beyond in 2024

Regional weather challenges & impacts:

Given that weather is largely a regional challenge, the survey sought to profile the top five most commonly felt severe weather and environmental events for each region. The numbers below indicate the percentage of regional respondents affected by that kind of weather or disaster:



Key learning: Wind is king

It's a ubiquitous challenge that's felt in different ways across various regions. In the South Atlantic, South Central, and Middle Atlantic, wind is often paired with other kinds of extreme weather as part of a hurricane or tropical storm event. In the Pacific and Mountain regions, wind interplays with wildfires to create and exacerbate air quality events. Whatever challenges your area is prone to, wind will be there to make them more challenging.



Where the damage is being felt the hardest:

The South Central region -- which includes Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Tennessee, and Kentucky -- reported the highest rates of economic impacts due to weather. The Pacific region of California, Oregon, and Washington had the second highest rate, with international and North Central region respondents just behind them.

Region	Middle Atlantic	Mountain Region	New England	North Central	Pacific	South Atlantic	South Central	Outside the U.S.
% who experienced a measurable financial impact from severe weather	15%	12%	12%	19%	20%	18%	28%	18%

Across all 8 regions

60%

60% of governments and agencies experienced damage or losses due to weather

The highest percentage of governments were impacted in the **South Central (77%)** and **South Atlantic (67%)** regions

48%

48% of businesses experienced damage or losses due to weather

The highest percentage of businesses were impacted in the **Middle Atlantic (59%)**, **South Atlantic (55%)** and **North Central (50%)** regions

13%

13% of individuals experienced damage or losses due to weather

The highest percentage of individuals by far were impacted in the **South Central (24%)**, with no other region reporting a rate higher than the average

In the South Atlantic, 18% of businesses -- nearly one in five -- lost \$100,000 or more due to weather in 2024.

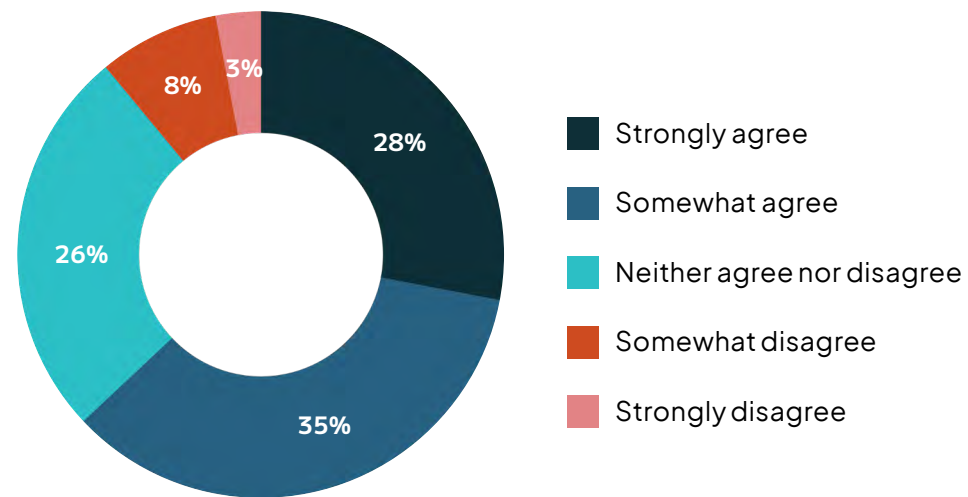
...Looking at those numbers, it's clear that the yearly Atlantic tropical storm/hurricane season is a major damage driver, as the South Atlantic, South Central, and Middle Atlantic Regions are all represented among the highest-impact regions.

In the west, wildfires are also having catastrophic impacts. **Half** the local governments and supporting agencies we talked to in the Mountain Region suffered more than \$1,000,000 in impacts this year, as did 30% of their colleagues in the Pacific.

Assessing response

To understand satisfaction levels with current approaches around the country and world, we asked all respondents to grade their community and local leaders:

"COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."



63%

generally **agree** community and local leaders did a good job

11%

generally **disagree** that community and local leaders did a good job

26%

are **undecided** or **do not have strong feelings either way**

Though those numbers look solid at first blush in light of how challenging it is to build consensus on any topic involving the public interest, they're inflated a little by potentially over-exuberance from those in the local government and response agency group. There is a confidence gap of approximately 16% between those doing the work of community leadership and those they serve (which we'll explore at length in the Focus Report for government).

Key insights

Weather and environmental hazards are impacting people and causing damage all over the world. In the United States, hurricanes and the associated winds, lightning, and flooding remain the most dangerous force in the south and east, while wildfires continue to grow in scope and destructive capacity in the west and the mountains.

While they may not be at the forefront of the public imagination like some of the other events included in the survey, air quality events are a significant growing concern, as they were a top-five reported experience in five of the eight regions included in the survey. As many in the American northeast have learned over the last few years, you don't need to be anywhere near a wildfire for it to have an impact on air quality and public health in your area.

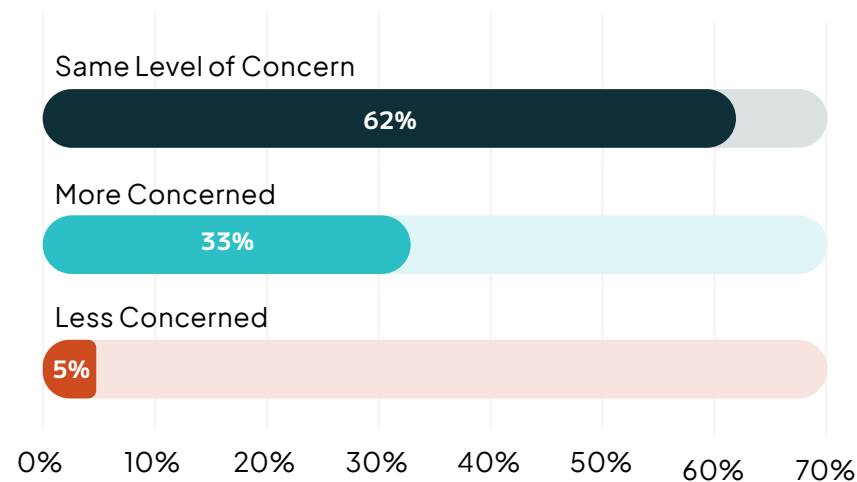
A majority of respondents agree that community and local leaders managed severe weather and environmental events effectively over the last year, but that doesn't mean there's any time for patting ourselves on the back. In fact, things could be even more challenging moving forward.

Thinking Forward: Profiling weather resilience plans & expectations for 2025

Only **5%** of the governments, businesses, and people we surveyed are less concerned about severe weather than a year ago about.

1/3 are more concerned.

COMPARED TO A YEAR AGO, ARE YOU MORE CONCERNED, LESS CONCERNED, OR AT THE SAME LEVEL OF CONCERN REGARDING SEVERE WEATHER'S POTENTIAL IMPACT?



The data shows that stakeholders across the community appreciate that the challenge of severe weather isn't going anywhere soon.

In spite of that, when we asked how much money respondents had budgeted for weather resilience in 2025, the most common response among all three groups was **ZERO!**

To compare funding efforts across such different stakeholder groups in a way that was illustrative, we scaled those responses into four ranges: no budget, modest budget (the lowest non-zero choice), large budget (the highest possible choice), and medium budget (any values in the middle).

Budget	Government	Business	Individuals
None	64%	59%	42%
Modest	21%	25%	1%
Medium	10%	8%	28%
Large	5%	9%	29%

(For more detailed breakdowns and dollar amounts of budget ranges, please refer to each group's respective Focus Report below.)

While governments and businesses obviously command much larger budgets than individual households, the survey uncovered that everyday people might actually be budgeting more at scale than the bigger entities.

Individuals are **20%** more likely to have money set aside for weather than the governments that represent and serve them, and private citizens were the most likely to report having a "large budget" by a substantial margin.

57% of all respondents express confidence that their community and local leaders will manage severe weather effectively in the coming year.

- That's **-6%** from the percentage who agreed they were effective last year!

"I'M CONFIDENT COMMUNITY AND LOCAL LEADERS WILL MANAGE THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2025."

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Key insights












Confidence in local weather resilience efforts may actually be decreasing, as 16% disagree their local leaders will do a good job in 2025 compared to just 11% feeling they did poorly in 2024. With “neither agree or disagree” fluctuating only 1% between the “Looking Back” and “Thinking Forward” windows, it’s clear that expectations are trending slightly but appreciably in the negative.

Of note, 68% of local governments and agencies agreed with confidence, while just 52% of businesses and 58% of individual citizens agreed. That again indicates a major gap between the government and the people it serves when it comes to assessing readiness and management capability.

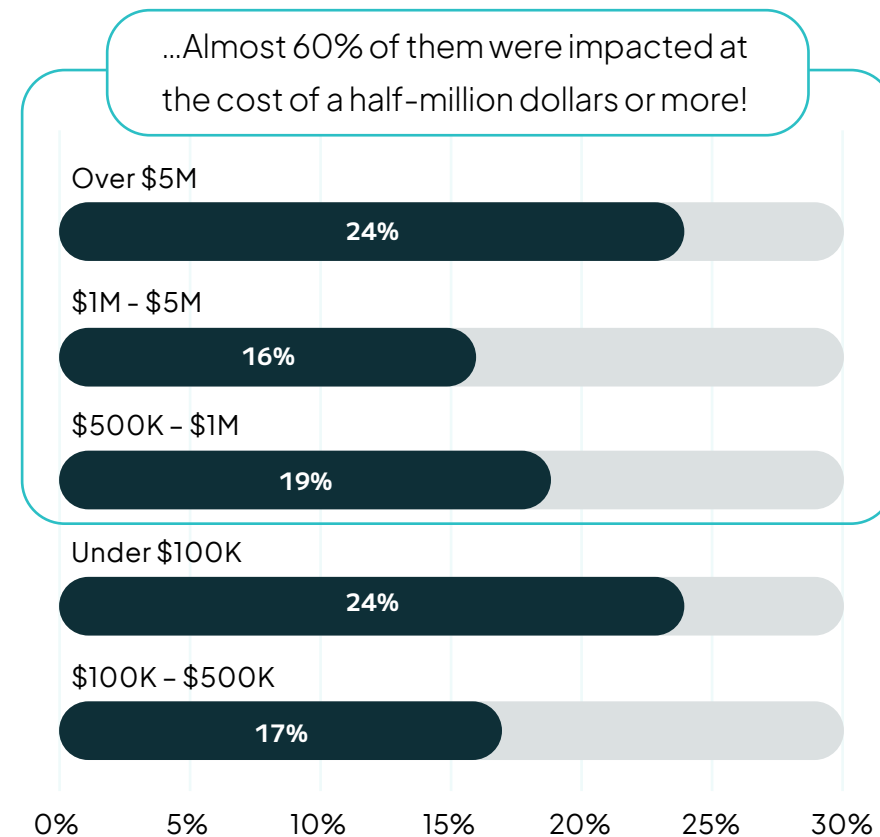
In 2025, weather will have a measurable impact on many communities across the U.S. and globe -- people recognize and appreciate that. However, investment in resilience is lagging behind in ways that could make those impacts much worse than they need to be.

Focus report: Severe weather's impact on government

86% of government agencies were disrupted by severe weather at least once in 2024.

Agencies across the U.S. and beyond were affected by...		
	Flooding	69%
	Wind	58%
	Lightning	48%
	Winter Weather	38%
	Air Quality Events	35%
	Hail	32%
	Wildfire	31%
	Tornado	28%
	Hurricane	17%
	Landslide	9%
	Earthquake	8%

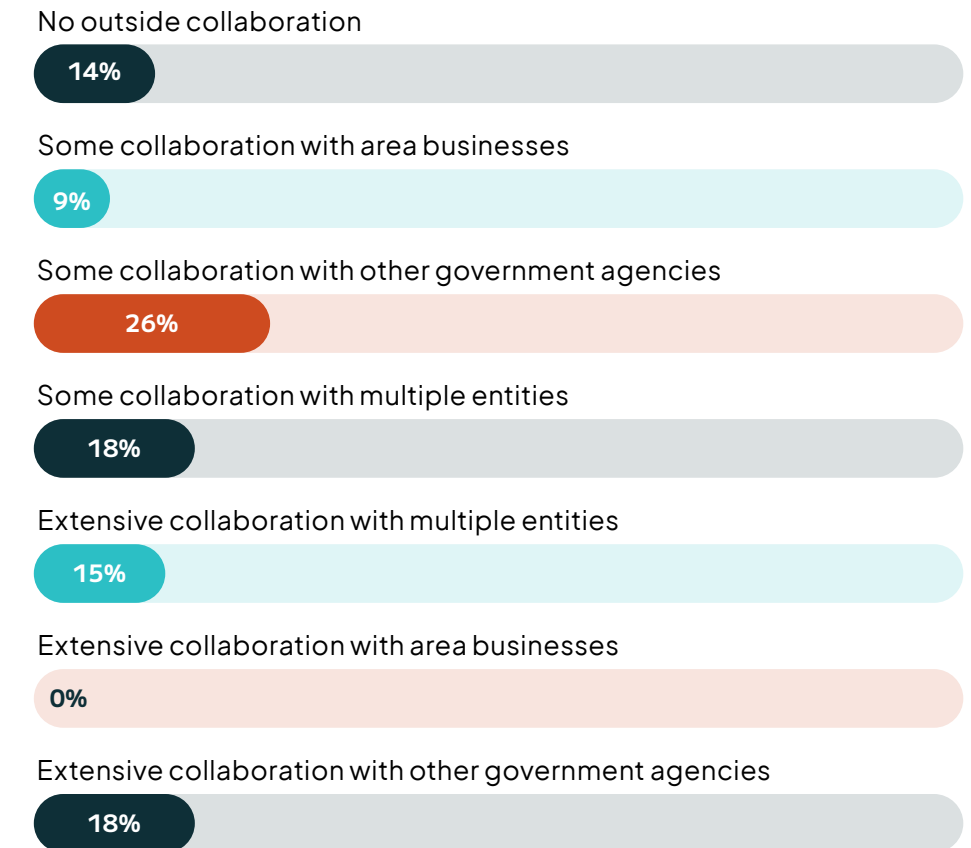
...And for **60%** of them, weather had a measurable financial impact on their community:



To address those challenges, local governments utilized a variety of severe weather resilience strategies in 2024, including...

- **Updating emergency response plans:** 41%
- **Training employees and residents for emergencies:** 35%
- **Installing weather monitoring equipment:** 27%
- **Investing in weather forecasting services:** 20%
- **Other strategies:** 10%
- ...And **17%** of agencies report no significant actions in 2024

Many local teams are collaborating with other agencies in their area to improve weather resilience, but they're not engaging private sector stakeholders as effectively:



The most popular other strategies were...

- **Proactive shutdowns**
- **Installing generators in city buildings**
- **Improved drainage**

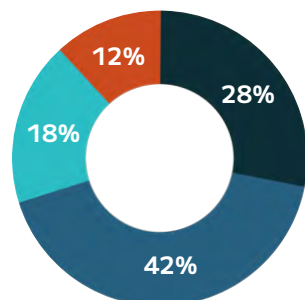


70% of public safety and water management organizations self-assess that they did a good job managing impacts in 2024:

...**But** when we asked the business community, ...they weren't quite as enthusiastic, revealing the need for better collaboration:

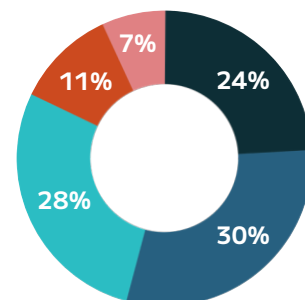
...And the responses from over 1,000 everyday citizens fell somewhere in the middle:

"OUR COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."



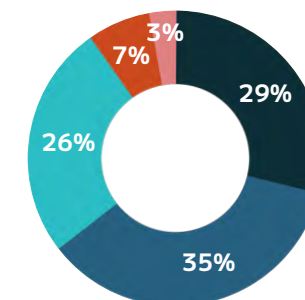
- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

"IN THE AREAS WHERE WE DO BUSINESS, COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."



- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

"MY COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."

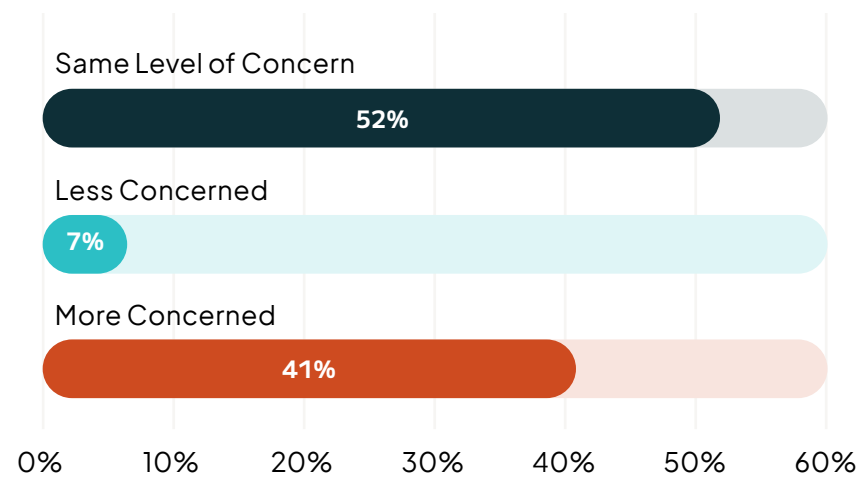


- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Weather resilience trends for government in 2025

We asked the same local agencies how they're feeling headed into the new year...

COMPARED TO A YEAR AGO, ARE YOU MORE CONCERNED, LESS CONCERNED, OR AT THE SAME LEVEL OF CONCERN REGARDING SEVERE WEATHER'S POTENTIAL IMPACT ON YOUR COMMUNITY?

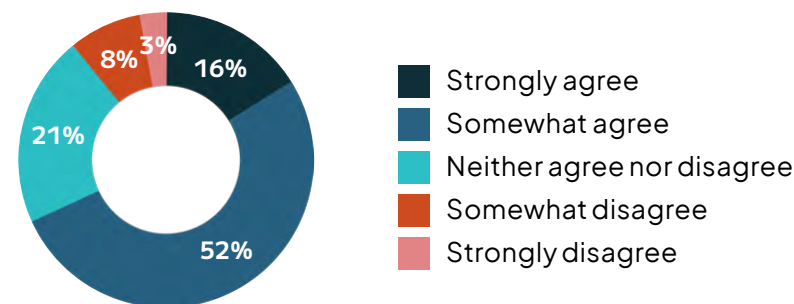


...And what they're anticipating will affect their areas in 2025:

	Flooding	65%
	Wind	57%
	Winter Weather	43%
	Lightning	38%
	Air Quality Events	31%
	Hail	29%
	Wildfire	27%
	Tornado	27%
	Hurricane	21%
	Earthquake	7%
	Landslide	7%

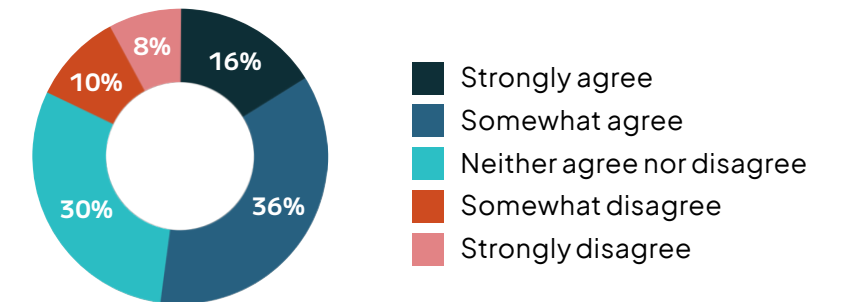
Local leaders express high confidence that they will handle these challenges effectively...

"I'M CONFIDENT OUR COMMUNITY AND LOCAL LEADERS WILL MANAGE THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2025."



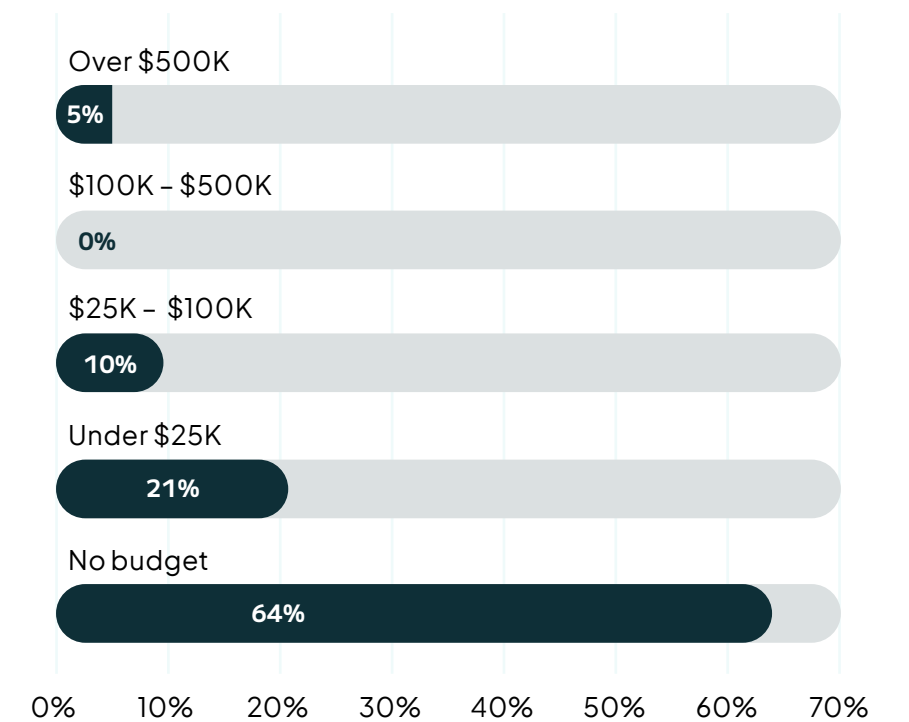
...Although, again, the business community isn't so positive:

"I'M CONFIDENT THE COMMUNITY AND LOCAL LEADERS IN THE AREAS WHERE WE DO BUSINESS WILL MANAGE THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2025."



In spite of that, **64%** of respondents said they had **ZERO** weather resilience budget for the upcoming year...

2025 weather resilience budgets for governments and agencies














Key insights for local governments and agencies

1. Wind, lightning, floods, and winter weather were the most common weather threats to local communities in 2024. Local leaders are expecting much of the same in 2025.
2. Local government agencies grade their performance handling severe weather challenges much higher than their private sector partners and the general population. More collaboration and communication are necessary to close that gap. For more specific recommendations on how to get a thriving collaboration started, be sure to check out our white paper "[How to Strengthen Public-Private Collaboration to Increase Weather Resilience.](#)"
3. Budget is a significant obstacle for governments and agencies looking to improve weather resilience. By expanding partnership and collaboration – both with other local government entities and private sector business partners – water management and public safety leaders can help rally together a stakeholder bloc with better funding and engagement.



Focus report: Severe weather's impact on business

83% of businesses were disrupted by severe weather at least once in 2024.

Businesses across the U.S. and beyond were affected by...		
	Wind	59%
	Lightning	47%
	Flooding	46%
	Winter Weather	42%
	Hail	33%
	Hurricane	27%
	Tornado	26%
	Air Quality Events	25%
	Wildfire	18%
	Earthquake	9%
	Landslide	8%

...And for 59% of business, weather had a measurable impact of at least **-\$10,000** on the bottom line!

- For 28%, it was more than **-\$100,000**

To address those challenges, businesses utilized a variety of severe weather resilience strategies in 2024, including...

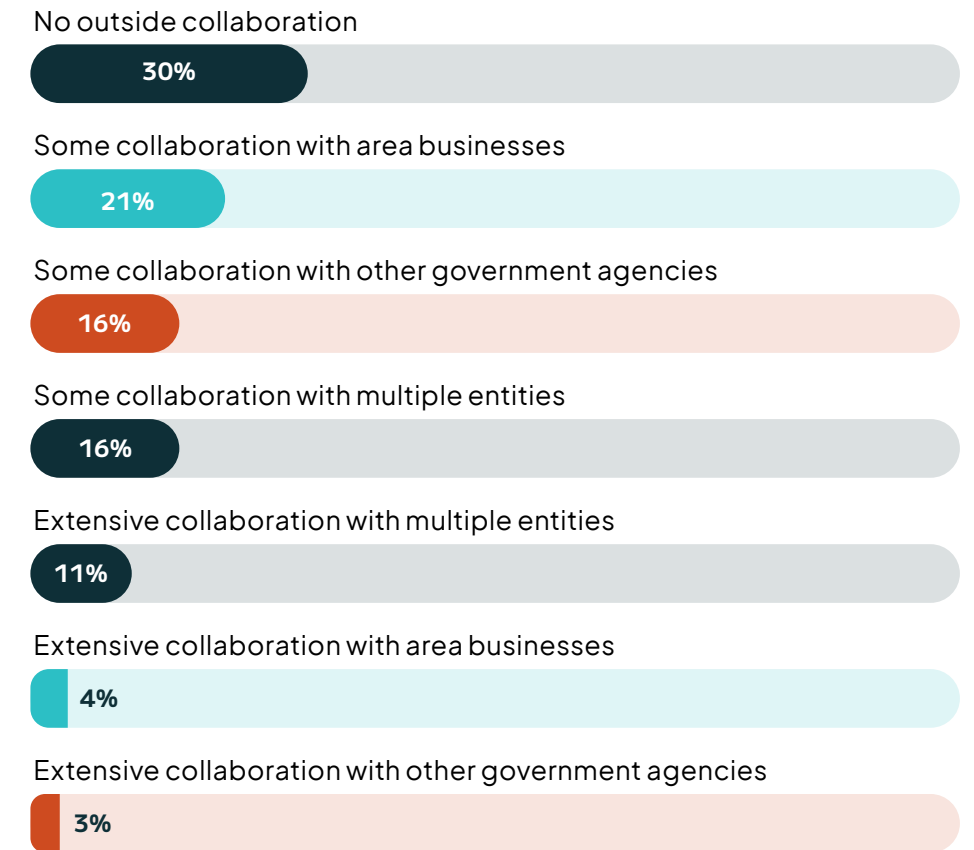
- **Updating emergency response plans:** 40%
- **Installing weather monitoring equipment:** 40%
- **Training employees for emergencies:** 36%
- **Investing in weather forecasting services:** 27%
- **Other strategies:** 7%
- ...And **27%** of businesses did nothing!



The most popular 'other' strategy was sending weather alerts directly to employees' phones.

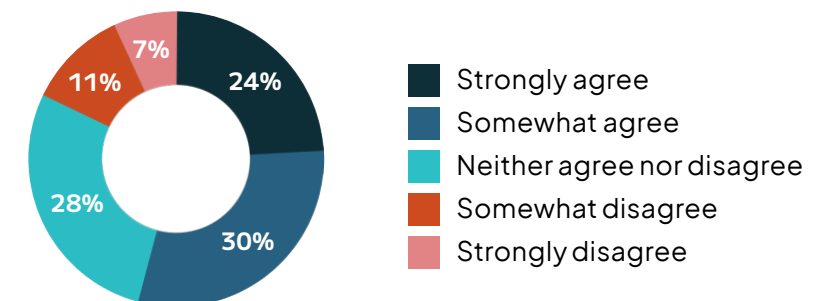


Some businesses are collaborating with other stakeholders in their area to improve weather resilience, but many still are not!



...And the business community is somewhat divided in assessment of how well local leadership is doing managing severe weather events:

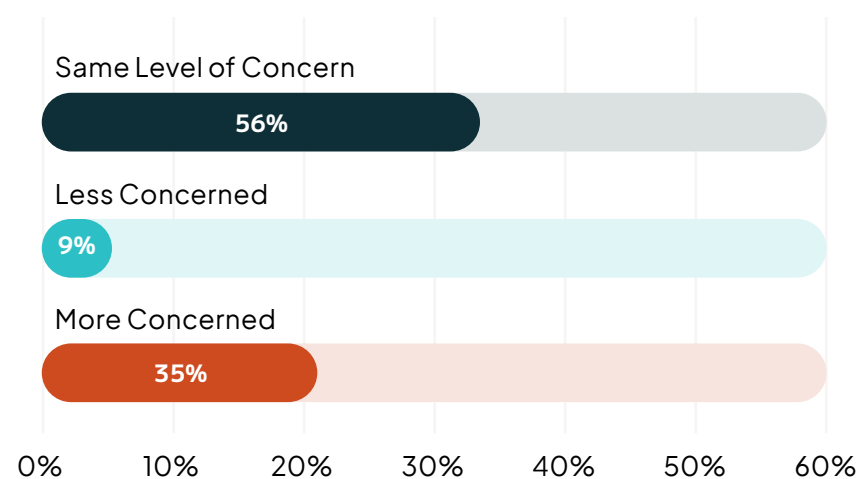
"IN THE AREAS WHERE WE DO BUSINESS, COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."



Weather resilience trends for businesses in 2025

We asked businesses how they're feeling headed into the new year...

COMPARED TO A YEAR AGO, ARE YOU MORE CONCERNED, LESS CONCERNED, OR AT THE SAME LEVEL OF CONCERN REGARDING SEVERE WEATHER'S POTENTIAL IMPACT ON YOUR BUSINESS?

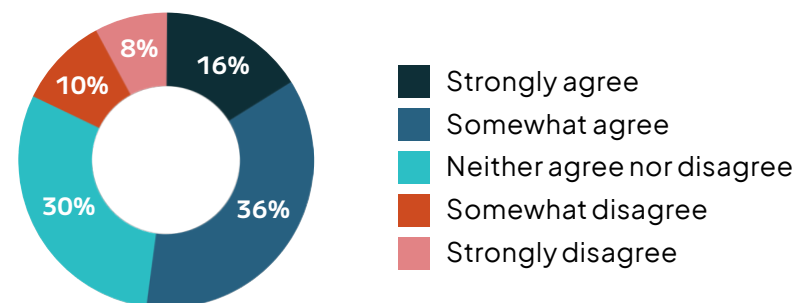


...And what they're anticipating will affect operations in 2025:

	Wind	65%
	Winter Weather	55%
	Lightning	50%
	Flooding	44%
	Hurricane	35%
	Hail	32%
	Tornado	26%
	Wildfire	24%
	Air Quality Events	23%
	Earthquake	7%
	Landslide	7%

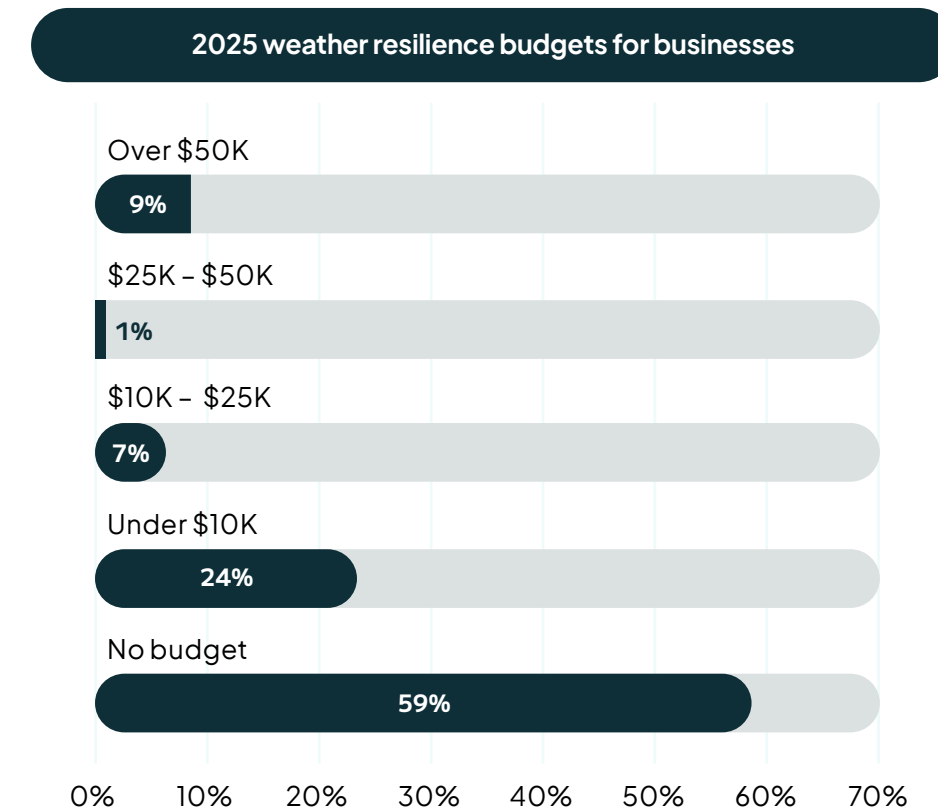
Only about half are confident local leaders will handle the challenge effectively. These numbers align almost exactly with their experiences in 2024.

"I'M CONFIDENT THE COMMUNITY AND LOCAL LEADERS IN THE AREAS WHERE WE DO BUSINESS WILL MANAGE THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2025."



In spite of that, 59% of respondents said they had **ZERO** weather resilience budget for the year...

- Only 17% had a budget of more than \$10,000



Key insights for businesses












1. Wind, lightning, floods, and winter weather were the most common weather threats to businesses in 2024. Business leaders are expecting much of the same in 2025.
2. Roughly 30% of businesses did nothing proactive to improve their severe weather resilience in 2024, and almost 60% have no budget to make improvements in 2025. That seems misaligned with the challenge, considering only 10% of respondents are becoming less concerned about weather's impact on the bottom line.
3. If businesses are skeptical of the quality of local leadership, they can become part of the solution by becoming more engaged and collaborative with other area stakeholders. For more specific recommendations on how to get a thriving collaboration started, be sure to check out our white paper "[**How to Strengthen Public-Private Collaboration to Increase Weather Resilience.**](#)"



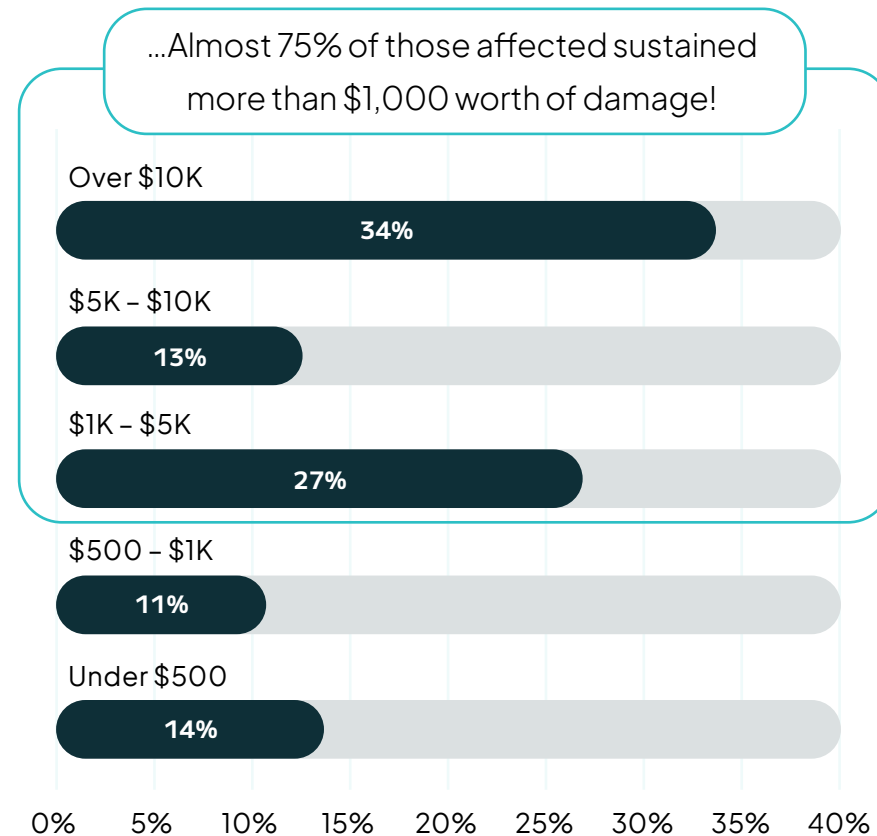
Focus report: Severe weather's impact on individual citizens

72% of individuals surveyed were disrupted by severe weather at least once in 2024.

- **59%** were disrupted on multiple days
- **20%** were disrupted on six or more days

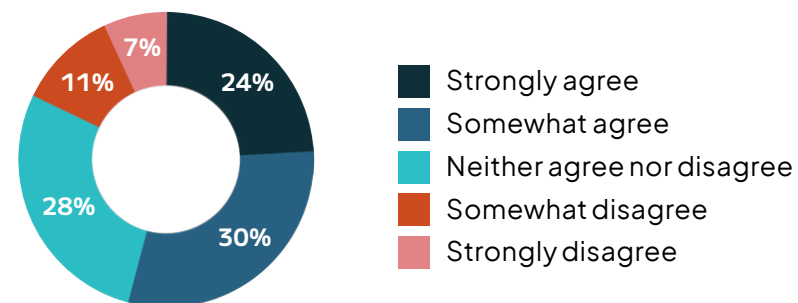
Citizens across the U.S. and beyond were affected by...		
	Wind	68%
	Lightning	39%
	Winter Weather	36%
	Air Quality Events	32%
	Hail	28%
	Flooding	22%
	Wildfire	17%
	Hurricane	17%
	Tornado	16%
	Earthquake	8%
	Landslide	2%

...And although weather had a measurable financial impact on just **13%** of respondents' properties, those who did experience damage paid dearly:



Just over half of everyday citizens agree that their local leaders managed severe weather effectively in 2024, but nearly one-in-five disagree.

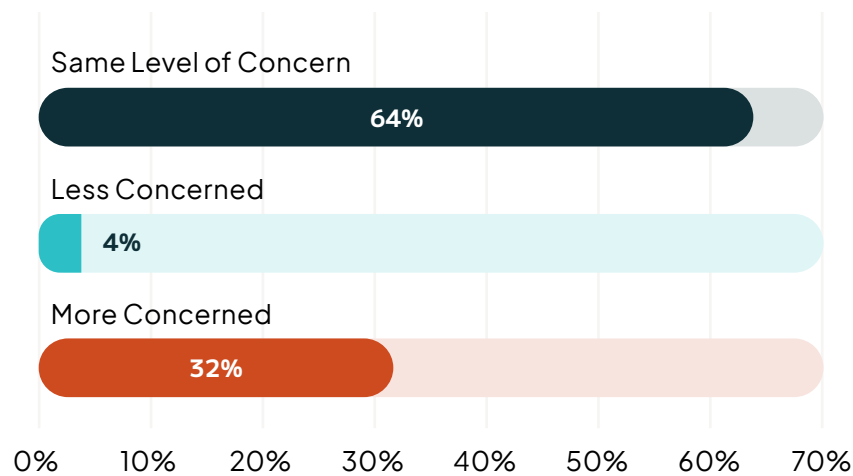
"MY COMMUNITY AND LOCAL LEADERS MANAGED THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2024."



Weather resilience trends for individual citizens in 2025

We asked the same individuals how they're feeling headed into the new year...

COMPARED TO A YEAR AGO, ARE YOU MORE CONCERNED, LESS CONCERNED, OR AT THE SAME LEVEL OF CONCERN REGARDING SEVERE WEATHER'S POTENTIAL IMPACT ON YOUR PROPERTY?

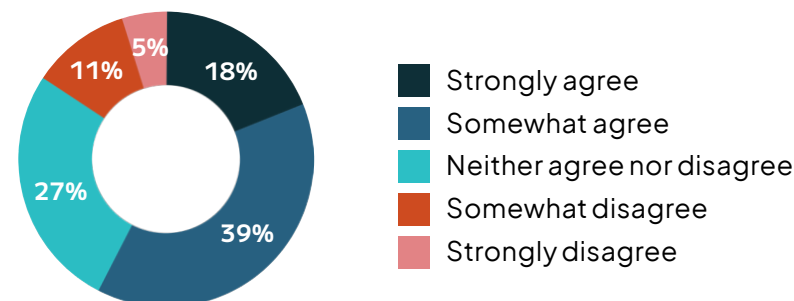


...And what they're anticipating will affect them personally in 2025:

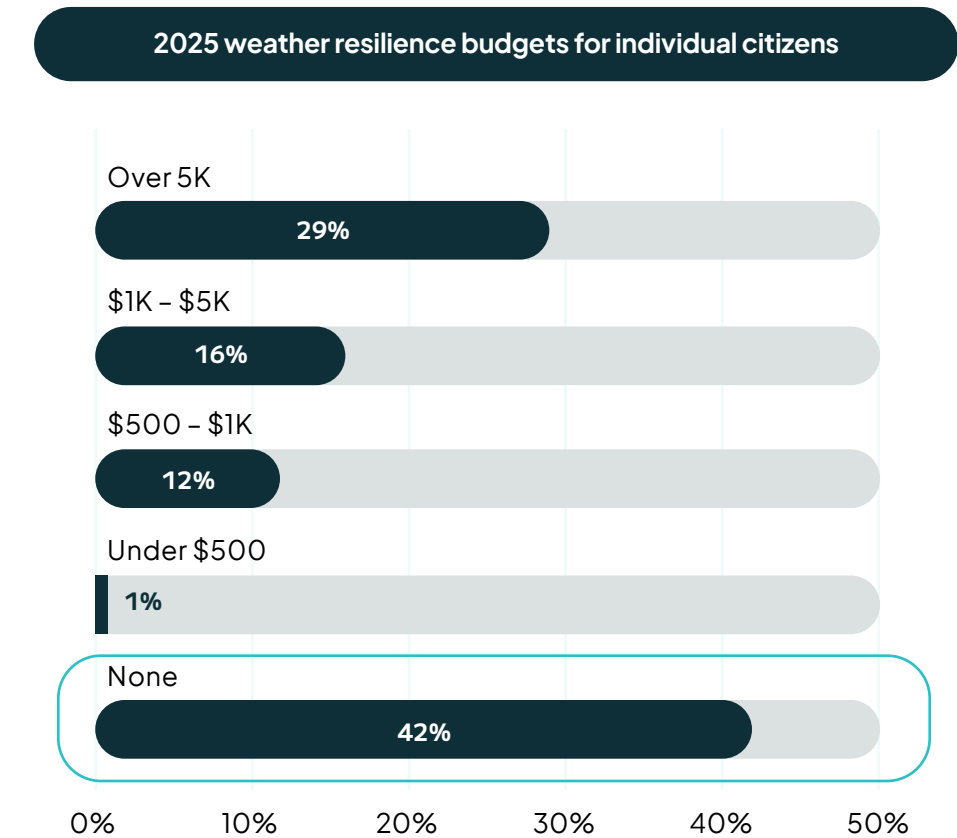
	Wind	74%
	Winter Weather	49%
	Lightning	40%
	Hail	34%
	Air Quality Event	29%
	Flooding	25%
	Tornado	24%
	Hurricane	21%
	Wildfire	19%
	Earthquake	7%
	Landslide	3%

Just under **60%** are confident that their local leaders will manage severe weather effectively in 2025. Comparing these numbers to their assessment of 2024, there is some optimism in the general public that leaders are getting better at this:

"I'M CONFIDENT MY COMMUNITY AND LOCAL LEADERS WILL MANAGE THE IMPACTS OF SEVERE WEATHER EFFECTIVELY IN 2025."



In spite of their confidence, an almost identical percentage have proactively set aside a budget to improve preparedness:



Key insights for private citizens

1. Wind is by far the most common form of severe weather doing measurable damage to people's property. Lightning put more than a third of people at risk in 2024, and winter weather is a disruptor for roughly one-third of respondents, although it is largely a regional challenge.
2. When weather does damage personal property, it tends to do major damage. More than one in three individuals whose property was impacted by severe weather in 2024 suffered \$10,000 in damage or more. That's why proper insurance and other practical forms or preparation are essential.
3. If you're part of the 58% of the population with at least some budget for weather resilience, it's important to consider which investments will be most impactful to protect you, your family, and your property. The smaller the budget, the more important it is to invest it wisely.



2024 EOY Report Key Takeaways



In today's current environment, weather challenges predictably disrupt the vast majority of people, businesses, and governments. All three groups need to shift toward more proactive weather resilience strategies. Ironically, individuals may actually be investing more at scale than the other two groups when it comes to weather readiness. Governments and businesses need to increase their investments to minimize disruption and protect economic continuity and daily normalcy in their areas.



Local governments and area business communities are not making the most of opportunities to collaborate around weather resilience. It's a shared challenge that they feel in strikingly similar rates – both in terms of event types and financial impact – and neither group has the funding to tackle the challenge on their own. Increased collaboration provides an opportunity to pool budgets, human resources, and knowledge to increase readiness and decrease the threat of weather-related disruptions.



Less than 10% of respondents are less concerned about severe weather for 2025 than they were in 2024. In spite of that, 17% of governments and 27% of businesses took no significant actions to improve readiness and resilience capacity, and more than half of them have no budget to invest next year. People understand the seriousness of the challenge, but there's still a gap in making sure we take measurable steps to improve the situation.



International responses broke down fairly similarly to those from the U.S. across the three response groups. Of note, 43% of international businesses reported measurable financial impacts from weather compared to 48% from the general response group, while 62% of global government agencies experienced measurable losses, compared to 60% of their U.S. colleagues. In future reports, the international audience will be segmented further to create more precise, powerful insights.



The U.S.'s biggest economic impacts in 2024 were felt in the South Central and South Atlantic regions, where hurricanes and lightning are common. In the Mountains and Pacific, wildfires are the main big-ticket threats, and while fires don't often move through major population centers in the way a hurricane does, they do have a major economic impact when they do reach property and infrastructure. New England was the region where respondents were least likely to report that weather and the environment hit them in the wallet.



Weather is indeed a regional challenge, but certain themes are emerging across the continental United States and world. Wildfires, winds, tornadoes, and hurricanes each affect various regions, but all of them are leading to an increase in air quality events.



Looking to increase weather resilience in 2025 and beyond? AEM can help!

Whether you work in business or government or are just a regular person trying to protect their family in the face of escalating severe weather events, AEM has the products and expertise you need to increase readiness and bounce back faster.



Our meteorological services team is on call 24/7/365, creating custom forecasts and providing expert advice to help customers around the world prepare, face, and recover from whatever Mother Nature can send their way.



Our flood team combines engineering expertise, precision measurement, and our proprietary Vflo® Flood Model to create the backbones of Flood Early Warning Systems (FEWS) that protect lives and enable better leadership.



Our wildfire team helps fire agencies and stakeholder businesses embrace a multi-source ignition detection strategy that combines the best of emerging AI technology with human expertise to address the growing threat of wildfires.



Our lightning team is constantly researching new ways to understand, measure, and even predict lightning to strengthen our industry-leading Sferic lightning detection and alerting product line.



Our agriculture team transforms water, fertilizer, and pest management for farmers at all scales around the world, enabling them to protect profits and the harvest through data-driven precision agriculture practices.



Our personal weather team makes it easy for weather enthusiasts to gather and view the data they need to make informed decisions around energy usage, daily scheduling, and severe weather preparation.

Whatever your weather resilience goals for 2025, AEM can help you make the most of your budget to protect your community or business.

To learn more, visit aem.eco/solutions!

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