2022

State of Flood Risk Management Report





Contents

About this report	03
Participants	04
Top weather risks	06
Biggest challenges managing flood risk	07
Recent and future flood impact	08
Use of flood safety policies and tools	09
Top flood risk management tools	10
Important features for a flood risk management system	11
Planned spend in 2022	12
Conclusion	13

About this report

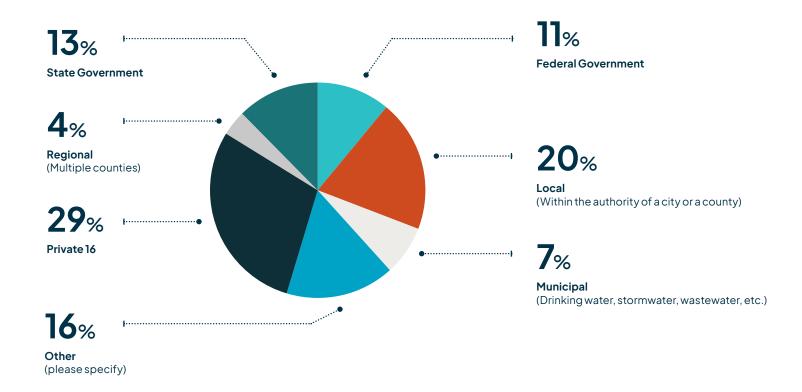
The 2022 AEM Flood Safety Survey collected responses from professionals across the globe in state and local government, federal government, and private enterprise. Almost half the respondents identified themselves as state and local government employees while the rest identified themselves as federal government and private enterprise employees.

We analyzed the results from this survey and compiled actionable insights into this State of Flood Risk Management Report. In the report, you'll learn how flooding impacts your peers, their biggest flood risk management challenges, and the solutions they use to mitigate flood risk and improve flood decision-making.

Participants

53 state and local government, federal government, and private enterprise professionals responded to our survey. Although no single group represented a majority of the responses, State and Local government collectively made up 44%. Included within the "other" respondents were colleges, golf clubs, and farms.

1. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR ORGANIZATION?



Responses came in from many regions around the globe, with the majority coming from North America (United States 51%; Canada 11%).



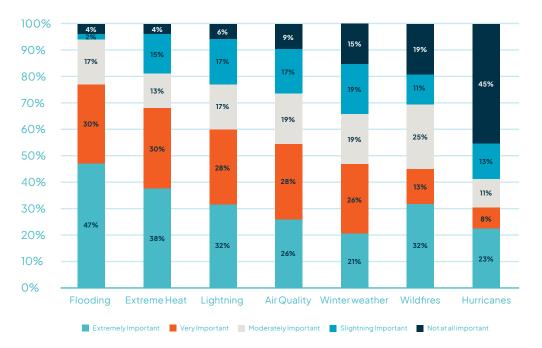
Top weather risks

It's no surprise that flooding ranked as the top weather-related risk. Especially since heavy rainfall and storm surges impact millions of people and cause billions of dollars of damage to property, infrastructure, and communities every year.

It's also no surprise that the second and third top weather risks right behind flooding are extreme heat and lightning. In 2022, scorching temperatures, lengthy heatwaves, and fatal lightning strikes have continued to make headlines across the northern hemisphere. And each of these factors can have an impact on flood risk. As temperatures rise, warmer air holds more moisture, and storm clouds release more and heavier rainfall when they eventually break. Lightning signals the onset of dangerous thunderstorms, which contain large volumes of rain over a short period of time.

Although winter weather, wildfires, and hurricanes remain dangerous threats, it makes sense that our respondents rank them lower in importance, since they tend to impact only specific regions around the globe.

2. HOW IMPORTANT ARE EACH OF THESE WEATHER-RELATED RISKS TO YOUR ORGANIZATION?



of respondents indicate extreme heat is extremely or very important

68%

77%

veryimportant

of respondents indicate

flooding is extremely or

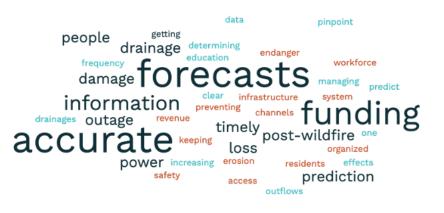
60%

of respondents indicate lightning is extremely or very important

Biggest challenges managing flood risk

In light of the many challenges involved in managing flood risk, it makes sense that many organizations would consider it a top-rated weather risk.

When asked, "What's your biggest challenge in managing flood risk?" a few key challenges floated to the top.



Here are some of the most common challenges among our respondents:



Accurate and reliable data to inform decisions and proactively notify people



Lack of funding to implement tools for flood risk mitigation and monitoring



Property and infrastructure damage



ìî

Lack of access to flooded areas for first responders and field crews

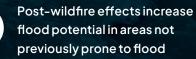
Lost revenue from power outages at commercial facilities and for utility companies



Keeping drainage channels clear during heavy rainfall



Workforce safety when traveling to or for work during a flood event





Trying to get all the relevant information into one platform

Recent and future impact

Impact of floods expected to rise in 2022-2023

Most respondents (60%) indicated floods impacted their organization less than 10 days in 2021-2022. Of those that indicated they experienced more than 10 flood days over that same period, more than half of the responses were from government organizations.

HOW MANY DAYS DID SEVERE FLOOD RISKS IMPACT YOUR OPERATIONS IN 2021–2022?

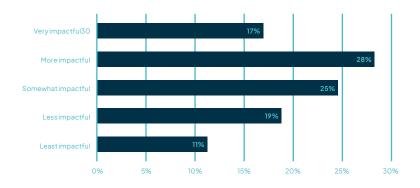
FLOOD DAYS PER YEAR	% OF RESPONDENTS
1–10	60%
11–20	2%
21-30	25%
31-40	2%
41+	11%



page - 8

The impact of flooding is expected to increase through 2023, with 70% of respondents indicating flooding will have a higher impact on their organization in that period. Government organizations (state, local, and national) were most likely to report that flooding would be very or more impactful in the next two years. Private organizations were most likely to indicate flooding would be less or least impactful to their organization in 2022.

4. HOW IMPACTFUL DO YOU EXPECT FLOOD RISKS TO BE AT YOUR ORGANIZATION IN 2022–2023?

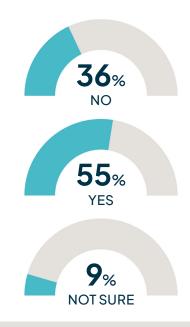


Of the respondents that noted fewer than 10 flood days in 2021-2022, 60% indicated they expect floods to have a greater impact on their organization 2022-2023. This suggests that even though some areas may not currently experience a high frequency of flooding events, people understand that the risk is increasing and they need to be prepared.

Use of flood safety policies

Since flooding is the most important weather-related risk, you might assume that most organizations have an active flood safety plan in place to mitigate flood risk. However, only 55% of respondents indicated their organizations have safety policies, action plans, or technology plans for flood management. The good news is that among the organizations that do have plans, most review and update their plans at regular intervals.

Not having a flood safety policy, action plan, or technology in place can be risky, especially when you consider the increased risk floods present to lives and property. According to the National Weather Service, there were 145 flood fatalities in the U.S. in 2021. Most of these fatalities occurred while driving or at home, and could have been prevented with a coordinated community action plan fueled by data and alerts from a predictive early warning system.



Update frequency of flood safety policies

Among the organizations that do have a flood safety policy, 97% review and update their plans at regular intervals.

5. IF YOUR BUSINESS OR ORGANIZATION HAS A FLOOD SAFETY POLICY AND/OR ACTION PLAN IN PLACE, HOW FREQUENTLY IS IT REVIEWED AND UPDATED?

FLOOD DAYS PER YEAR		
More than once a year	34%	
1-5 years	55%	
More than 5 years	7%	
Never	3%	

It is interesting to consider how the days of flood risk correspond to the frequency of safety policy reviews. Most organizations with fewer than 10 days of flood risk (59%) review and update their flood risk policy every 1–5 years. However, 24% review their flood risk policy at least once a year. This suggests that even a few days of flood risk is too much risk NOT to have a well-designed plan with reliable technology to protect lives and property.

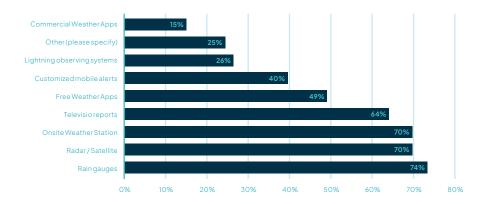
Top flood risk management tools

What tools are your peers using to mitigate flood risk?

The three most trusted flood safety tools respondents use are rain gauges, onsite weather stations, and radar/satellite. Rain gauges and onsite weather stations are excellent tools for detecting dangerous conditions at specific locations. When used together with radar / satellite, they can help determine where a storm is headed and when heavy rainfall and floods could impact people and property in the path of the storm.



6. WHAT FLOOD SAFETY TOOLS DO YOU CURRENTLY USE TO MONITOR AND ALERT UPON FLOOD WARNING THREATS AT YOUR ORGANIZATION?

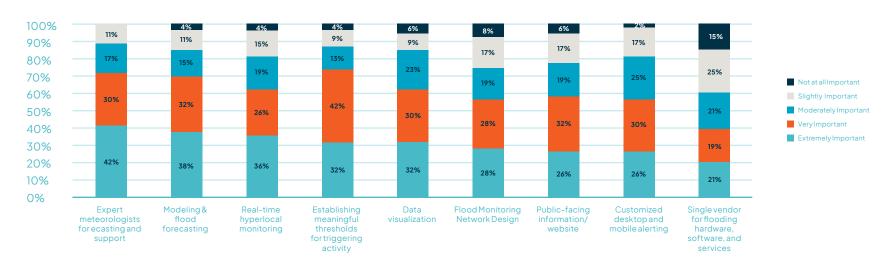


As we learned earlier, a lack of funding for flood risk management tools is a key challenge for many organizations. We see that challenge reflected here in the high usage of free weather data, such as television reports and free weather apps. This also reflects the challenge of accessing accurate and reliable information to predict when floods will impact a community or organization. Although these tools are popular and affordable, they do not provide the precise, real-time data and alerts that are required to inform critical decisions and save lives and property.

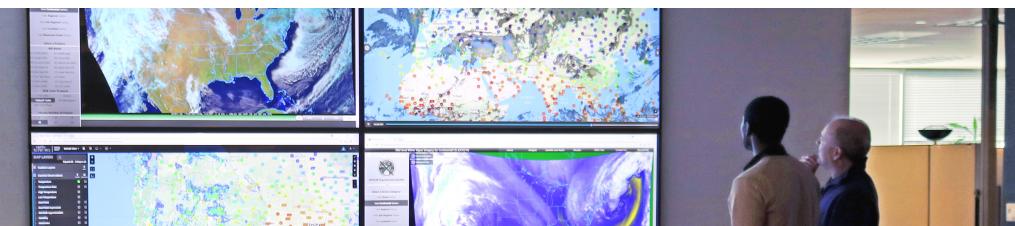


Important features of a flood risk management system

When asking professionals about must-have features for a flood risk management system, features that focused on forecasting and modelling topped the list. When the waters reach flood stage and above, it is often too late to take action. With expert meteorologists either in house or on call, organizations receive forecasts customized to an event or specific need to help them make the best possible operational weather-influenced decisions.



7. WHEN ADDRESSING THE CHALLENGES OF FLOOD MANAGEMENT, WHAT ARE THE MOST IMPORTANT FEATURES FOR A FLOOD RISK MANAGEMENT SYSTEM?

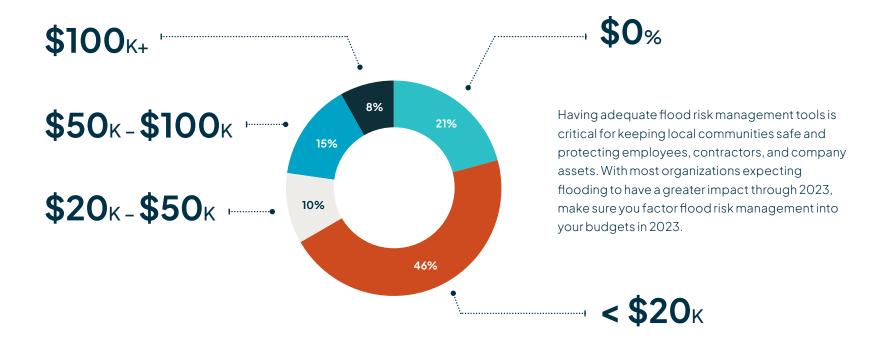


Planned spend in 2022

Flood risk management programs are underfunded

Two-thirds of respondents stated their organizations have budgeted less than \$20,000 in 2022 for flood risk management tools and programs. State and Local Government respondents were more likely to have larger budgets with more than one-third reporting a budget of over \$50,000. Private organizations had more limited budgets with 80% reporting less than \$20,000 to spend in 2022.

8. APPROXIMATELY HOW MUCH MONEY DO YOU PLAN TO SPEND ON FLOOD RISK MANAGEMENT TOOLS AND PROGRAMS AT YOUR ORGANIZATION THROUGHOUT 2022?



Conclusion

As government and private organizations continue aligning priorities to better fit their communities, employees, and stakeholders, they should not overlook the importance of overall flood safety and preparedness. Most respondents understand this, as they report flooding as the most important weather-related risk with a high impact to their organization.

The best way to serve your community, employees, and stakeholders is to prepare for anything and everything flood-related, so you can protect lives and property. You need more than just a safety plan. You also need the right team and tools to implement your plan.

If you're ready to build a flood risk management system and safety plan or improve your current ones, we can help. See our contact information on the next page.

ADDRESS

AEM 12410 Milestone Center Dr., Suite 300 Germantown, MD 20876

EMAIL

info@aem.eco