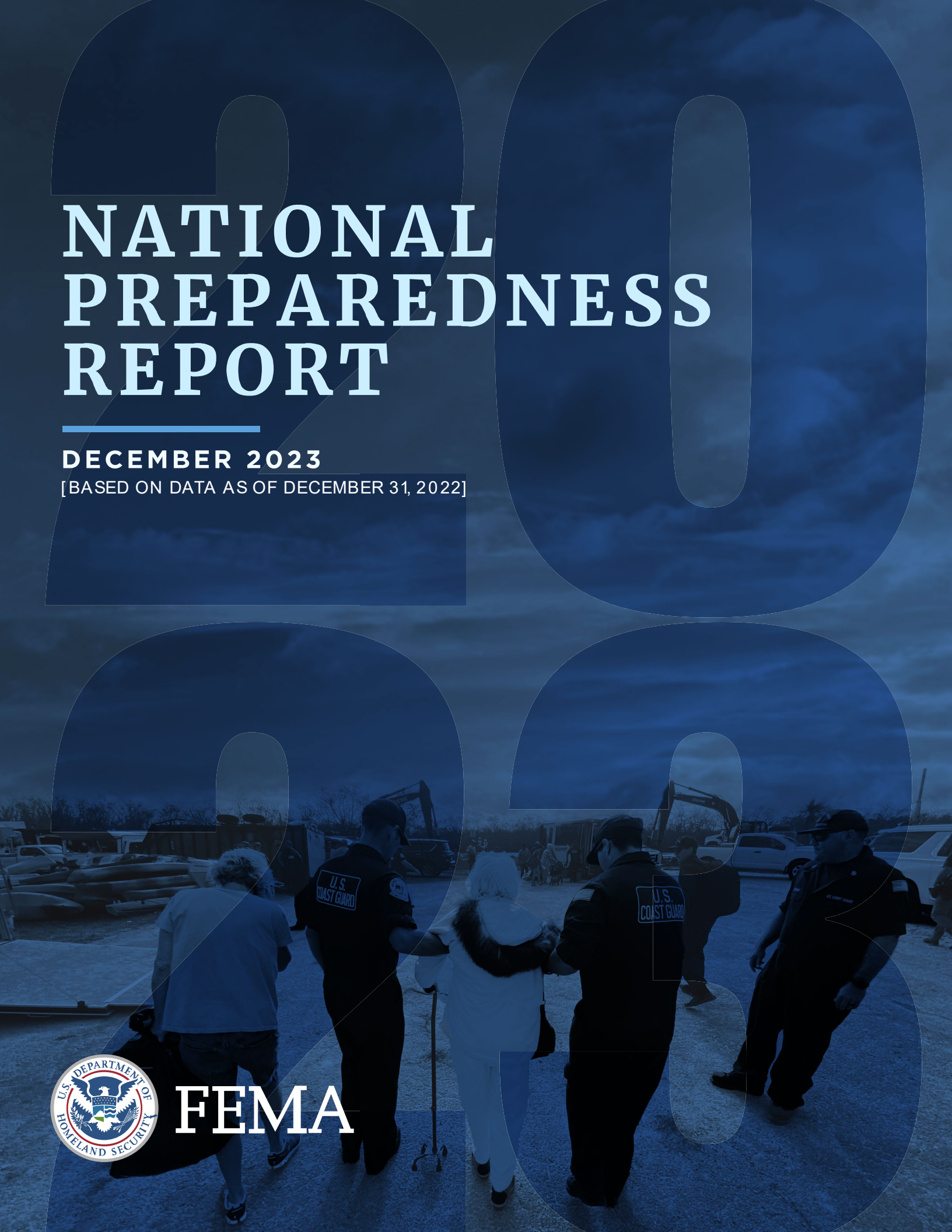
NATIONAL PREPAREDNESS REPORT

DECEMBER 2023

[BASED ON DATA AS OF DECEMBER 31, 2022]



FEMA

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Foreword

I am pleased to announce the release of the 2023 National Preparedness Report (NPR). The 2023 NPR is the 12th report released by the Federal Emergency Management Agency (FEMA) on the state of the nation's preparedness for all threats and hazards. Since FEMA began reporting over a decade ago, disasters like hurricanes Sandy, Irma, Maria, Harvey, and Ian, the coronavirus disease 2019 (COVID-19) pandemic, the 2020 California wildfires, and the 2023 Hawaii wildfires have disrupted the lives of Americans across the nation and drastically increased the demands placed on the emergency management community. Climate change has led to more frequent and severe weather including heat and cold waves, hurricanes, droughts, and wildfires, among other hazards. In the face of these challenges, emergency managers must continue to adapt, forge new partnerships to mitigate threats and hazards, and anticipate post-disaster challenges to help individuals and communities.

This year's report provides a data-driven picture of national preparedness and emergency management trends. This includes focused discussions on four core capabilities (Fire Management and Suppression; Logistics and Supply Chain Management; Public Health, Healthcare, and Emergency Medical Services [EMS]; and Long-Term Vulnerability Reduction) that continue to challenge emergency managers, as well as concrete recommendations that partners and stakeholders across the whole community can take to increase their resilience. In our new normal, where disasters are more commonplace and devastating than ever, we must all identify targeted hazard mitigation investments, leverage historic and future risk data, and provide equitable disaster risk reduction for socially vulnerable populations.

Deanne Criswell

FEMA Administrator

Though these efforts can sometimes be challenging to implement in the short-term, they will lower the nation's collective risk and bolster our long-term resiliency. We have a responsibility to one another to ensure everyone has the help they need before, during, and after disasters. While work remains, I am confident that we will continue to grow ever more resilient as a nation.

Introduction & Executive Summary

Through the NPR, FEMA assesses the nation's emergency management posture and identifies challenges and opportunities for improvement. FEMA has developed the NPR for the past eleven years as an annual requirement of Presidential Policy Directive 8 and in alignment with the Post-Katrina Emergency Management Reform Act. The NPR provides partners across the nation with insights about risks and associated capabilities to support decisions about program priorities, resource allocations, and community actions. Whole community partners are the intended audience of the NPR—including all levels of government, individuals and families, community organizations and nonprofits, and businesses.

The 2023 NPR outlines the nation's progress towards achieving the National Preparedness Goal of "A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk" as well as recommendations for closing remaining gaps. This annual report draws upon various data sources, including open-source data, FEMA and community preparedness data sets, and submissions from federal departments and agencies. FEMA also recognizes critical infrastructure owners and operators as important partners in emergency management and community resilience, but did not collect insights into preparedness from this group, as such research presently extends beyond the scope of this report.

The NPR covers the domestic preparedness and emergency management challenges facing the nation. For information regarding international threats and hazards, refer to the 2023 Office of Director of National Intelligence Annual Threat Assessment. For information regarding homeland security threats and hazards, refer to the 2023 Quadrennial Homeland Security Review and the Department of Homeland Security's (DHS) 2023 Homeland Threat Assessment.

The following sections provide an executive summary of the 2023 NPR key findings, recommendations, and structure.

1. Findings

The nation continues to face several challenges and an evolving threat and hazard landscape, including:

Increasing Frequency, Severity, and Cost of Disasters: From January 2020 to December 2022, 60 climate-related disasters caused 1,460 fatalities and 2,939 injuries.[1,2] These disasters have all cost at least $1 billion each, marking a significant increase in costly climate-related disasters from

decades prior.[1] Calendar year 2022 accounted for 18 climate-related disasters that cost at least $1 billion.[3] Additionally, in 2016 at the peak of hurricane season, FEMA was managing 30 major disasters in 18 joint field offices (JFO). At the same point in 2023, FEMA was managing over twice the number of major disasters (i.e., 71) in 25 JFOs. FEMA is now in its sixth year of operating with higher average daily deployments, which have doubled from 3,331 responders pre-2017, to 7,113 responders post-2017.

High Community-Level Risk: In 2022, communities identified cyberattacks, pandemics, and floods as most likely to occur and cyberattacks, pandemics, and earthquakes as most stressful for one or more capabilities.[4] In higher-risk areas throughout the nation, communities report lower target achievement in capabilities like Long-Term Housing, Relocation Assistance, and Community Sheltering than the rest of the nation.[4] Compounding this finding, these communities' most stressing natural hazards (i.e., earthquakes, wildfires, and floods) significantly impact disaster survivors' access to housing or shelter.

Ongoing Individual and Household Preparedness Gaps: The 2022 National Household Survey on Disaster Preparedness found that 42 percent of respondents plan to prepare for identified threats and hazards in the future but have not started.[5] The percentage of survey participants indicating they did not intend to prepare decreased from 17 percent in 2017 to 9 percent in 2020 but rebounded to 14 percent in 2022.[5]

Lack of Standardized Building Code Adoption: The inconsistent adoption of building codes is one of the most significant factors that compounds risk and increases costs from natural hazards. Two out of three communities in the United States need to incorporate the latest building codes.[6] However, since the federal government does not have the authority to enforce building codes outside of tying incentives for adoption to federal funding requirements, and since no federal agency is responsible for administering building codes at the national level, the responsibility for adopting the latest building codes falls to state, local, tribal, and territorial (SLTT) governments.[7] This decentralization results in a wide variation in the adoption of model building codes and retention of hazard-resistant provisions in these model codes, code enforcement and administration mechanisms, and funding for enforcement, administration, outreach, and support.[7]

2. Recommendations

The whole community can drive resilience in the face of our nation's evolving threat and hazard landscape through the following actions:[8]

Target Investments towards Particular Core Capabilities and Mission Areas: In the Response mission area, communities report low levels of grant investment (less than $7 million) and lower target achievement (less than 65 percent) in Mass Care Services and Logistics and Supply Chain Management. Communities also consider Mass Care Services a high priority capability. These capabilities, along with three of the four Recovery core capabilities, fall within these ranges and may warrant that communities increase grant investments.

Reduce All-Hazards Challenges through Targeted Actions and Increased Coordination: These include expanding guidance on addressing climate impacts and conducting educational

awareness campaigns for SLTT governments to help share existing resources for building code and infrastructure upgrades, cybersecurity, and training. Incorporating the needs of individuals with disabilities, older adults, and individuals with limited English proficiency, limited access to transportation, and limited access to financial resources, among others, remains essential to ensuring equitable access to disaster risk reduction resources and advancing environmental justice as a core part of disaster preparedness. In addition, federal agencies' goals should align to and support long-term mitigation efforts addressing communities' top five most challenging threats and hazards: cyber-attacks, pandemics, floods, active shooters, and earthquakes.[4]

Address National Gaps to Prepare for Catastrophic Disasters: Through the National Stakeholder Preparedness Review, FEMA has drawn qualitative[i] conclusions about the nation's capability gaps and ability to manage catastrophic disasters and their impacts. These steps include investing more in coordination and communication systems with private sector entities, improving federal interagency coordination and data collection, providing systems for sharing data across the government, and increasing collaboration opportunities with SLTT governments, such as through more frequent, higher-quality exercises.

The National Climate Resiliency Framework and Defining Resilience

The 2023 National Climate Resiliency Framework defines resilience as "the ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions."[8] The Framework outlines six key objectives and actionable strategies to enhance and expedite progress in the realm of climate resilience:

- Embed climate resilience into planning and management.
- Increase resilience of the built environment to both acute climate shocks and chronic stressors.
- Mobilize capital, investment, and innovation to advance climate resilience at scale.
- Equip communities with information and resources needed to assess their climate risks and develop the climate resilience solutions most appropriate for them.
- Protect and sustainably manage lands and waters to enhance resilience, while providing numerous other benefits.
- Help communities become not only more resilient, but also more safe, healthy, equitable, and economically strong.

3. Report Structure

The 2023 NPR summarizes the progress made towards building and sustaining the capabilities required to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk to the nation. This annual report offers practical insights into preparedness and capabilities at the federal, state, local, tribal, and territorial levels to support decisions about program priorities, resource allocations, and actions for increasing whole community resilience. The

NPR pulls from open-source data, FEMA community preparedness data, and a federal interagency data call with submissions from departments and agencies across the federal government.

The 2023 NPR covers calendar year 2022 and builds on content from previous NPRs to analyze trends over time. The report contains the following key sections:

A **Risks** section that outlines the nation's most challenging threats and hazards, high-risk community target achievement, and levels of risk across the country.

A **Capabilities** section that describes trends at the individual and community levels based on data from the 2022 National Household Survey on Disaster Preparedness, Threat and Hazard Identification and Risk Assessment (THIRA), Stakeholder Preparedness Review (SPR), and National Stakeholder Preparedness Review (National SPR).

A **Focus Areas** section that examines a subset of core capabilities chosen for discussion based on preparedness assessment findings developed using THIRA/SPR and National SPR information. These four areas continue to challenge emergency management partners working to build and sustain capability and capacity. These focus areas include:

- Fire Management and Suppression
- Logistics and Supply Chain Management
- Public Health, Healthcare, and EMS
- Long-Term Vulnerability Reduction

Each Focus area contains more detailed information on risk, capabilities, and management opportunities related to the core capability, which whole community partners can utilize to develop strategies to reduce risk and bolster disaster resilience.

A **Conclusion** that summarizes the report's key findings and recommendations.

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Risks

Key Findings

- The nation has experienced a rise in the frequency, severity, and cost of climate-related disasters. From January 2020 to December 2023, 60 climate-related disasters caused 1,460 fatalities and 2,939 injuries.[1,2] These climate-related disasters have all cost at least $1 billion each, marking a significant increase in costly disasters from decades prior.[1] Calendar Year 2022 accounted for 18 climate-related disasters that cost at least $1 billion.[3]
- In 2016 at the peak of hurricane season, FEMA was managing 30 major disasters in 18 JFOs. At the same point in 2023, FEMA was managing over twice the number of major disasters (i.e., 71) in 25 JFOs. FEMA is now in its sixth year of operating with higher average daily deployments, which have doubled from 3,331 responders pre-2017, to 7,113 responders post-2017.
- In 2022, communities most frequently reported cyberattacks, pandemics, and floods as most likely to occur, and cyberattacks, pandemics, and earthquakes as most stressing for one or more capabilities.[4]
- Through 2022 THIRA/SPR submissions, Western communities have identified specific challenges related to long-term housing, relocation assistance, and community sheltering. These challenges are noteworthy because Western communities report lower target achievement levels in these critical areas than other communities across the nation.[4] Additionally, the Western U.S. faces unique natural hazards, including earthquakes, wildfires, and floods, which significantly impact disaster survivors' access to housing and shelter.[4] This assessment focuses on the Western U.S. as a case study. While this assessment focuses on the Western U.S., it may not fully represent the broader housing issues faced by communities across the nation.[4]

In 2022, the President declared 47 major climate-disasters, 10 emergencies, and 33 Fire Management Assistance Grants (FMAG).[9] These 57 major climate-related disasters and emergencies resulted in 474 deaths and a total cost of $165 billion—the third costliest year on record behind 2005 and 2017 (**Figure 1**).[1]

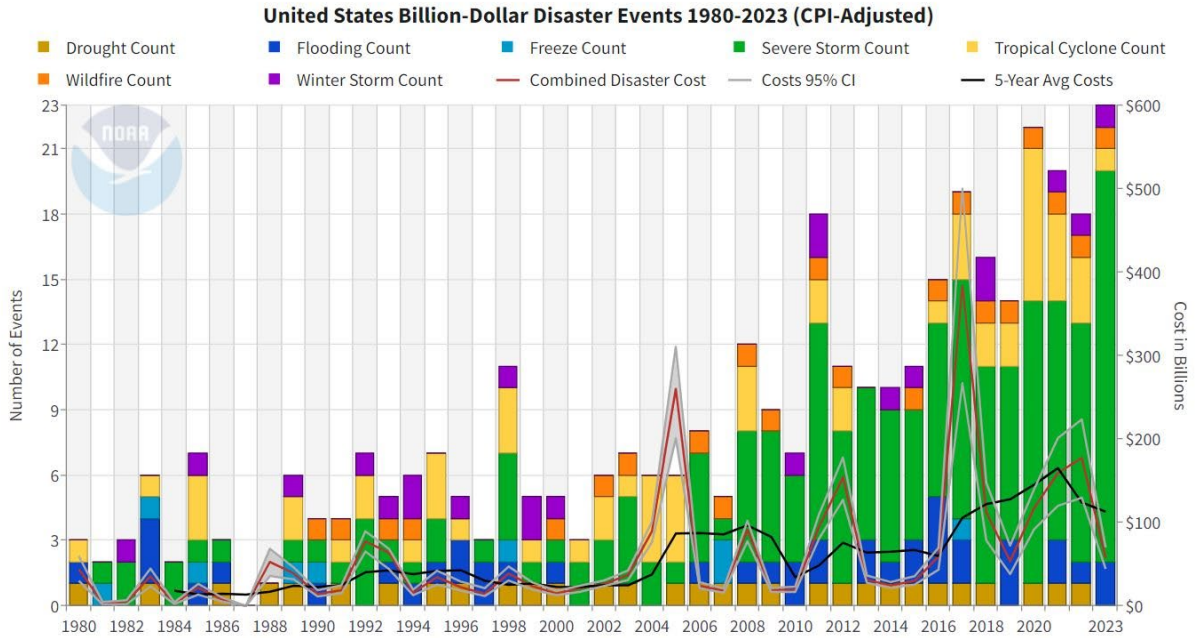


Figure 1: The number of billion-dollar climate-related disasters (adjusted by the Consumer Price Index, "a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. Indexes are available for the U.S. and various geographic areas") in the U.S. from 1980-2022. The y-axis indicates the number of disasters and the x-axis indicates the calendar year.[1] The data highlighted is current as of 9/11/2023.

In 2022, the National Oceanic and Atmospheric Administration (NOAA) identified that 18 incidents resulted in losses exceeding $1 billion each.[1,ii] These 18 incidents included one drought, one flood, one wildfire, one winter storm, three tropical cyclones, and 11 severe storms (**Figure 2**).[1] NOAA reported that from 2020 to 2022, 60 climate-related disasters caused 1,460 fatalities and 2,939 injuries.[1,2] These disasters have all cost at least $1 billion each, marking a significant increase in costly climate-related disasters from decades prior.[1] Previous decade totals for billion-dollar climate-related disasters (inflation-adjusted) were 33 (1980-1989), 57 (1990-1999), 67 (2000-2009), and 131 (2010-2019). Over these first three years of the current decade (2020-2029), the United States has already surpassed the total number of billion-dollar disasters from each decade between 1980 and 1999. Additionally, over the last three years (2020-2022) the United States has already experienced approximately half of the total number of billion-dollar climate-related disasters that occurred in the previous decade (2010-2019).

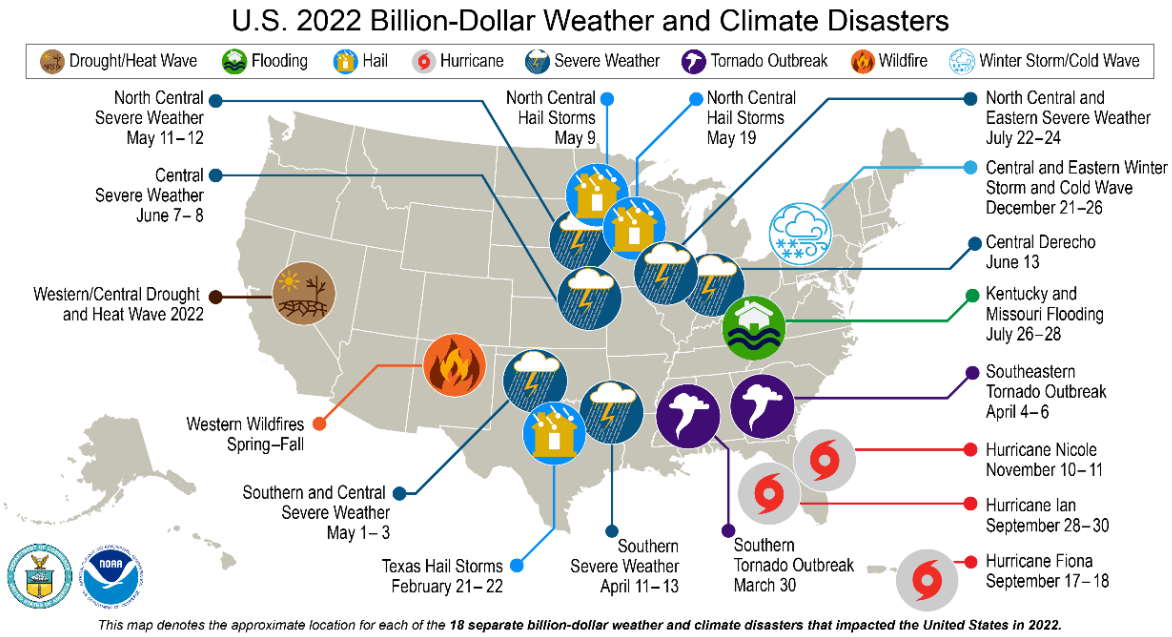


Figure 2: 2022 billion-dollar weather and climate disasters.[1]

Additionally, in 2016 at the peak of hurricane season, FEMA was managing 30 major disasters in 18 JFOs. At the same point in 2023, FEMA was managing over twice the number of major disasters (i.e., 71) in 25 JFOs. FEMA is now in its sixth year of operating with higher average daily deployments, which have doubled from 3,331 responders pre-2017, to 7,113 responders post-2017.

FEMA leverages data from the THIRA and SPR process to better understand the complex challenges communities face before, during, and after disasters, as well as their capability to manage them.[iii] The following sections explore key findings related to risk from the THIRA/SPR data, as well as from FEMA's National Risk Index (NRI).

4. Most Challenging Threats and Hazards

From 2019 to 2022, the five threats and hazards communities reported as most likely included cyberattacks, pandemics, floods, active shooter incidents, and earthquakes.[4] Starting in 2020, communities reported pandemics as a likely hazard more often than flooding and earthquakes. Communities also report on the threats and hazards that are most stressing for their capabilities.[4] From 2019 to 2021, communities chose cyberattacks and flooding as the two most stressing threat and hazard types for their capabilities, while in 2022, communities chose cyberattacks and pandemics.[4]

THIRA/SPR Terminology

- **Threat:** Indication of potential harm to life, information, operations, the environment, and/or property.[4]
- **Hazard:** A source or cause of harm or difficulty. A hazard also differs from a threat in that a threat is directed at an entity, asset, system, network, or geographic area. A hazard is not directed.[4]
- **Core Capability:** The distinct critical elements necessary to achieve the National Preparedness Goal. There are 32 core capabilities organized under five mission areas.[4]
- **Core Capability Target:** A goal to manage the impact of a threat or hazard in a desired amount of time that is associated with each core capability. Communities create core capability targets using standardized target language.[4] Core capability targets are used interchangeably with "capability goals" throughout this report.
- **(Capability) Target Achievement:** The extent to which a community has achieved (as a percentage) a core capability target. This report uses the terms "high-achieving capabilities" and "low-achieving capabilities" to indicate whether a community is closer to or further away from achieving a core capability target.[4]
- **High-Risk Community:** A community that is more vulnerable to, and less prepared for, the impacts of disasters, as assessed through FEMA's National Risk Index. Conversely, a low-risk community is less vulnerable and more prepared.[10]

Figure 3 depicts the most challenging threats and hazards for communities. A total of 137 communities reported this data through THIRA/SPR in 2022.[4]

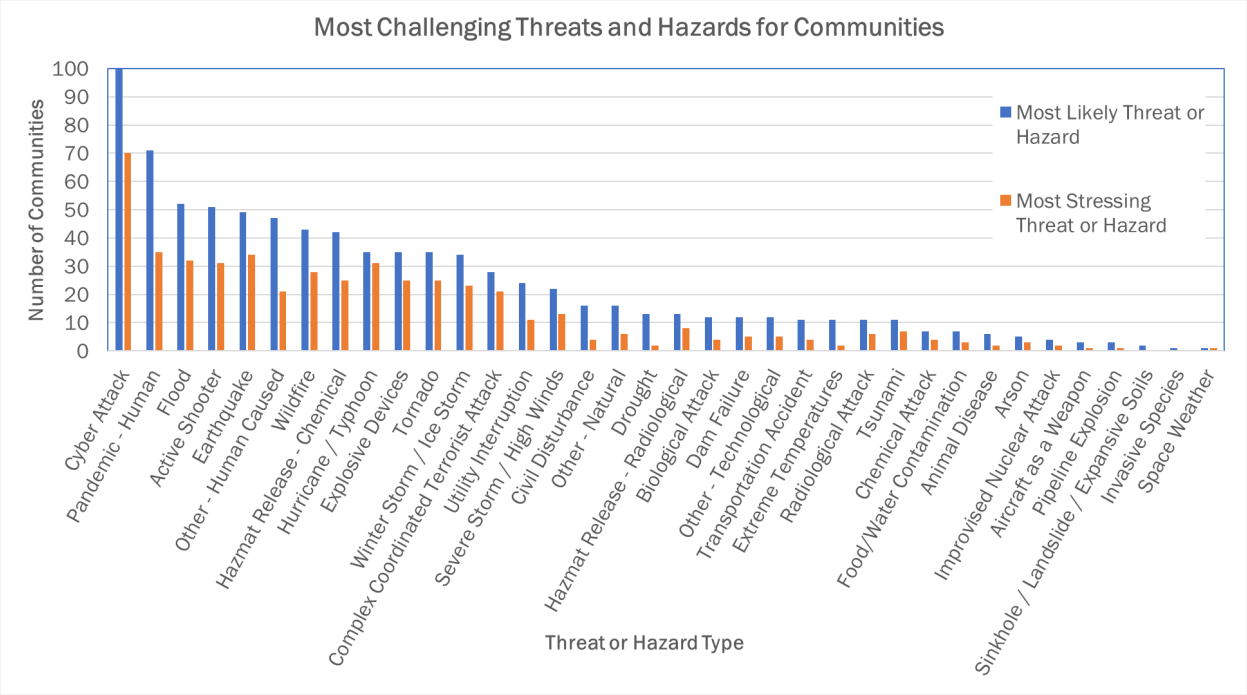


Figure 3: Number of communities identifying specific threats and hazards as most likely to occur (blue) and most stressing (orange)—organized from greatest cumulative total (likely + stressing) to least—through the THIRA/SPR process in 2022.[iv]

2022 THIRA/SPR data shows regional[v] differences in the types of disasters communities report as most challenging. For example, communities across the West most frequently reported wildfires, cyberattacks, and earthquakes as their top threats and hazards of concern. Communities in the Northeast and South most frequently reported cyberattacks, pandemics, and hurricanes/typhoons, whereas Midwest communities most frequently reported cyberattacks, tornadoes, and pandemics as their top threats and hazards of concern. Additionally, with regard to the lowest achieving capability targets, communities in the West reported being further away from their capability goals than communities in the South, Midwest, and Northeast (**Figure 4**).

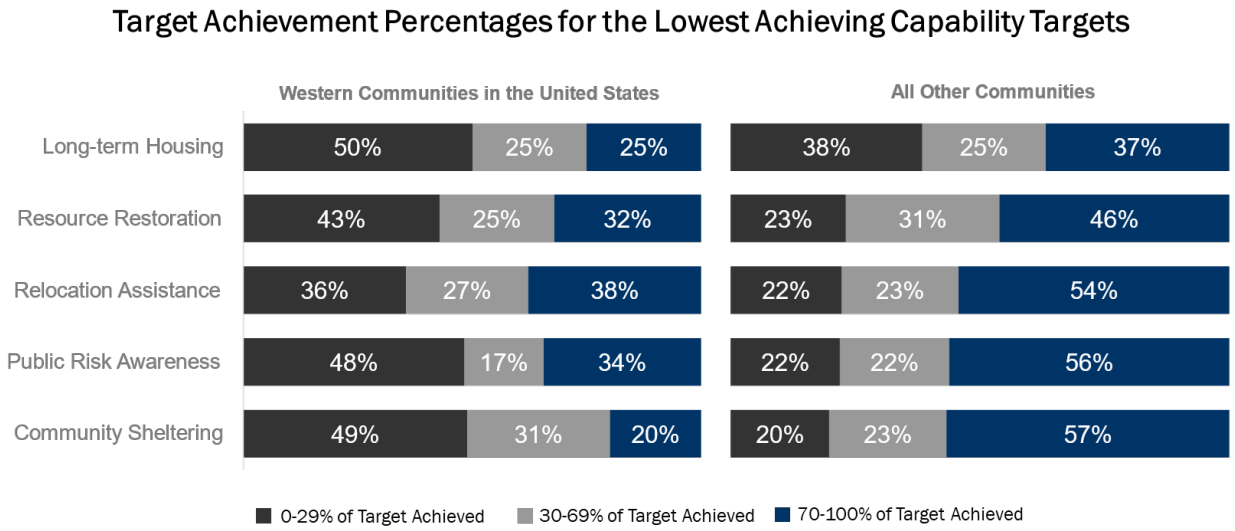


Figure 4: Target achievement percentages across communities in the Western United States (left) and for all other communities besides those in the Western United States (right) associated with the lowest achieving capability targets of Long-Term Housing, Resource Restoration, Relocation Assistance, Public Risk Awareness, and Community Sheltering. Dark gray indicates 0-29 percent of target achievement; a greater percentage of communities in the Western United States reported this level of target achievement.

5. Risk and Social Vulnerability Intersections

Every community across the nation includes populations that are more vulnerable to the impacts of disasters than others. Social factors such as high rates of poverty, lack of access to transportation, and limited housing options already make life difficult for individuals living in these communities. The impacts of disasters compound these vulnerabilities, causing additional difficulty for these communities as they work to respond to and recover in the aftermath of catastrophe. Emergency managers should consider the intersection between risk and social vulnerability to ensure the meeting of all people's needs equitably.

The NRI provides insights into which areas of the country (at the census tract level) are more vulnerable and less prepared based on the potential environmental, social, and economic effects of 18 natural hazards.[10] According to the NRI, many very high-risk census tracts are heavily concentrated in the

Western United States due to high population density along coastlines, high expected annual economic losses (in dollars) as a result of natural hazards, and elevated levels of social vulnerability.[10] In this region, communities often cite wildfires and earthquakes as their most likely and stressing natural hazards within their THIRA/SPR submissions.[4] Wildfires and earthquakes can significantly impact housing, leading many disaster survivors to become displaced or require alternative shelter, which can be a challenging prospect for communities in the Western United States that already possess lower capability compared to the rest of the country in areas like long-term housing, community sheltering, and relocation assistance.[4]

The South, Midwest, and the states of Florida and Hawaii face similarly high-risk levels as the Western United States (**Figure 5**).[10] These high-risk rankings are attributable to natural hazards such as hurricanes/typhoons, tornadoes, and severe weather (e.g., strong winds, heat waves, and winter weather), along with the high population density along coastlines and elevated levels of social vulnerability in these regions.[10] Emergency managers across the whole community can use the NRI and THIRA/SPR data to target support and investments to reduce risk, lessen the impact of disasters, and improve resilience. Emergency managers may also use FEMA's Resilience Analysis and Planning Tool and Climate Risk and Resilience Tool to assess community preparedness against several resiliency indicators and climate change data.[11] When merged, these tools can provide comprehensive climate analysis contextualized at the community level.[11]

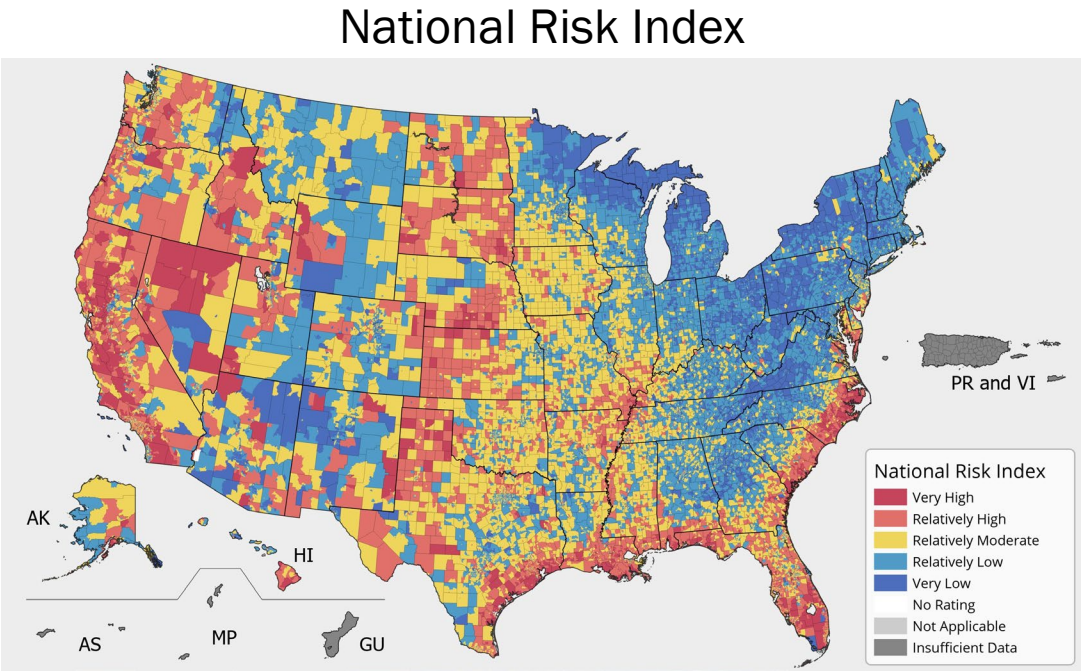
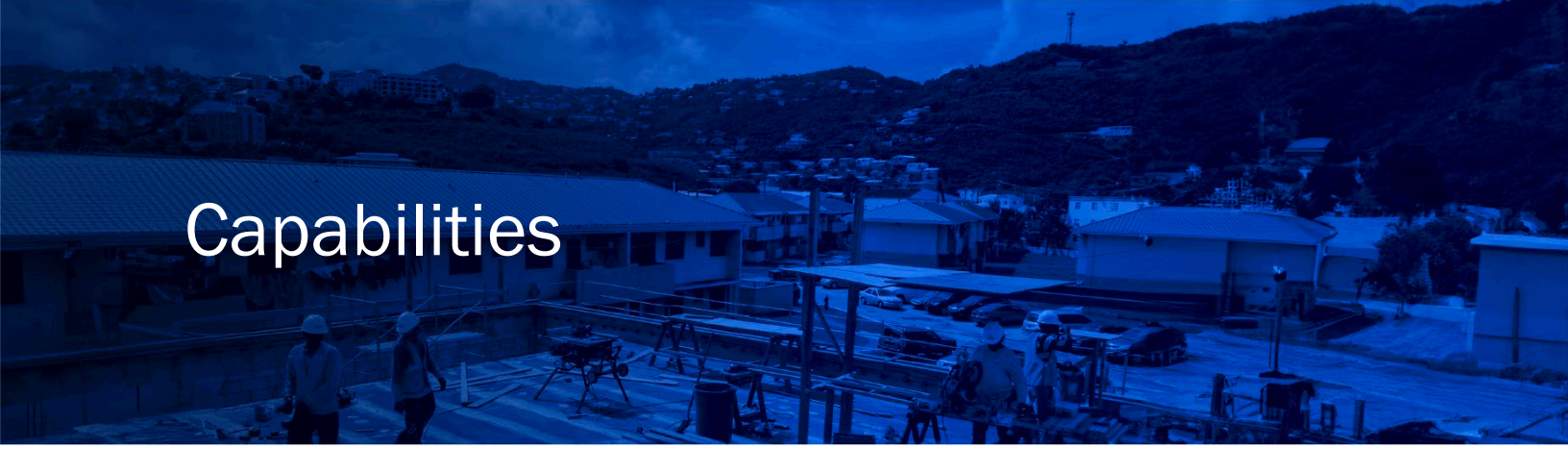


Figure 5: Variation in risk across the U.S. by census tract, based on March 2023 data. A color scale denotes levels of risk, with dark red indicating very high-risk areas, yellow indicating relatively moderate risk areas, and dark blue indicating very low risk areas.[vi]



Capabilities

Key Findings

- According to data from FEMA's 2022 National Household Survey on Disaster Preparedness, 42 percent of respondents intend to prepare for identified threats and hazards sometime in the future but have not yet started, and 14 percent do not intend to prepare.[5] The percentage of survey participants indicating they did not intend to prepare decreased from 17 percent in 2017 to 9 percent in 2020 but rebounded to 14 percent in 2022.[5]
- Communities report devoting most of their grant funding to specific core capabilities, including Planning, Operational Coordination, Physical Protective Measures, Intelligence and Information Sharing, and Interdiction and Disruption. Communities report high levels of funding and capability overall in the Cross-Cutting, Protection, and Response mission areas.[4]
- In the Response mission area, communities report low levels of grant investment (less than $7 million) and lower target achievement (less than 65 percent) in Mass Care Services and Logistics and Supply Chain Management. Communities also consider Mass Care Services a high priority capability. These capabilities and three of the four Recovery core capabilities fall within these ranges and may warrant increased grant investments.
- Federal subject-matter experts (SME) identified the most gaps in areas like planning and organization, as well as financial and resource capacity across core capabilities during the first phase of the National SPR, which focused on Response and Recovery mission area preparedness for a catastrophic incident.

As demonstrated by the THIRA/SPR and NRI, threat and hazard impacts vary by location, and capabilities to manage associated risk can differ based on communities' and individuals' access to resources and levels of vulnerability. This section describes some of the tools and resources that the emergency management community uses to assess capability across the nation, and outlines individual, community, and national preparedness trends.

6. Individual and Household Preparedness

Preparedness starts at the individual and household level and can serve as a benchmark for capability trends in communities and regions across the nation. Since 2013, FEMA has collected information on individual preparedness actions, attitudes, and motivations across the United States through its annual National Household Survey on Disaster Preparedness.[5] In 2022, FEMA conducted the survey from February 10, 2022 to April 20, 2022, in both English and Spanish, and collected data from 7,145

survey respondents across the country (**Figure 6**).[5] FEMA weighted responses by key demographic variables to enhance the national representativeness of the data.[5]

Demographic Communities		
Not Primarily English-Speaking Households	People with Disabilities	Lesbian, Gay, Bisexual, Transgender, and Queer, Plus (LGBTQ+)
60+ Community	Socioeconomically Disadvantaged	People with Faith-Based Beliefs and Religious Minorities
People Living in Rural Areas	Hispanic or Latino	American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, Two or More Races, and White

- In 2022, FEMA expanded surveying to include responses from additional historically underserved communities.
- FEMA chose groups that align with those identified in Executive Order 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.

Figure 6: Demographic communities analyzed by FEMA in the 2022 National Household Survey on Disaster Preparedness.

Over the past six years, FEMA has asked survey respondents to assess their preparedness (**Figure 7**) to obtain insight into actual and perceived preparedness.[5] The survey includes questions related to preparedness actions taken and self-assessed preparedness. From 2017 to 2020, a greater percentage of respondents indicated that they had taken three or more preparedness actions, but this percentage dropped below 2018 levels by 2022. In 2022, 55 percent of adults surveyed stated they had pursued three or more of the twelve preparedness actions.[vii] Similarly, from 2017 to 2019, FEMA observed a steep increase in the percentage of respondents who indicated (self-assessed) that they were prepared for a disaster. However, by 2022, this percentage had dropped back to the level it was in 2017. In 2022 only 45 percent of survey respondents indicated that they were prepared for a disaster. Moreover, 42 percent of respondents indicated that they intended to prepare sometime in the future but have not yet started. The percentage of survey participants indicating they did not intend to prepare decreased from 17 percent in 2017 to 9 percent in 2020, but rebounded to 14 percent in 2022.[5]

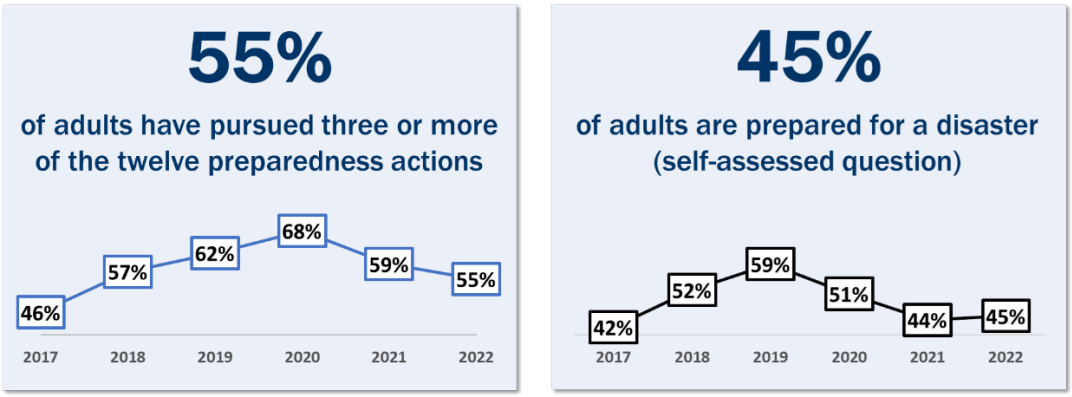


Figure 7: Findings from the 2022 National Household Survey on Disaster Preparedness on adult preparedness actions (left) and adults' self-assessed preparedness (right). All responses are self-reported.[5]

Although a variety of factors may be contributing to the changes in preparedness that FEMA has recorded over time, one of the most significant factors was the COVID-19 pandemic. The World Health Organization declared the coronavirus disease outbreak a public health emergency of international concern in January 2020, and a pandemic in March 2020. Respondents' resources may have decreased due to the COVID-19 pandemic, and real-world emergencies could have altered their estimations of emergency preparedness. It is notable that the percentage of adult respondents who reported pursuing three or more actions dropped after 2020, and that the percentage of adult respondents who reported being prepared for a disaster began to drop sharply after 2019.[5] Reduced preparedness—whether actual (preparedness actions) or perceived (self-assessed)—indicates potentially reduced capability at the individual and household level, which in turn impacts community preparedness.

7. Community Preparedness

SLTTs leverage federal grants to reduce risk, mitigate disaster impacts, and bolster capabilities. **Figure 8** displays the distribution of FEMA preparedness grants (i.e., non-disaster grants) by core capability in 2022 alongside average core capability target achievements across 2022 THIRA/SPR submissions to help correlate funding allocations' implications on capability achievement.[viii,ix]

The highest preparedness grant investments (by total invested amount) are in the Cross-Cutting, Protection, and Response mission area core capabilities, which correspondingly include four of the core capabilities that communities report as being closest to achieving their goals. The highest achieving core capabilities include Situational Assessment, Threats and Hazards Identification, Operational Communications, Operational Coordination, and Planning.[x] Some of these core capabilities were identified as national priority areas for FEMA in FY2022.[12]

The lowest preparedness grant investments are in the Recovery mission area, which likewise includes two of the core capabilities in which communities report being furthest away from achieving their goals – Housing and Natural and Cultural Resources. The five lowest achieving capabilities overall include

Housing, Natural and Cultural Resources, Mass Care Services, Risk Management for Protection Programs and Activities, and Logistics and Supply Chain Management.

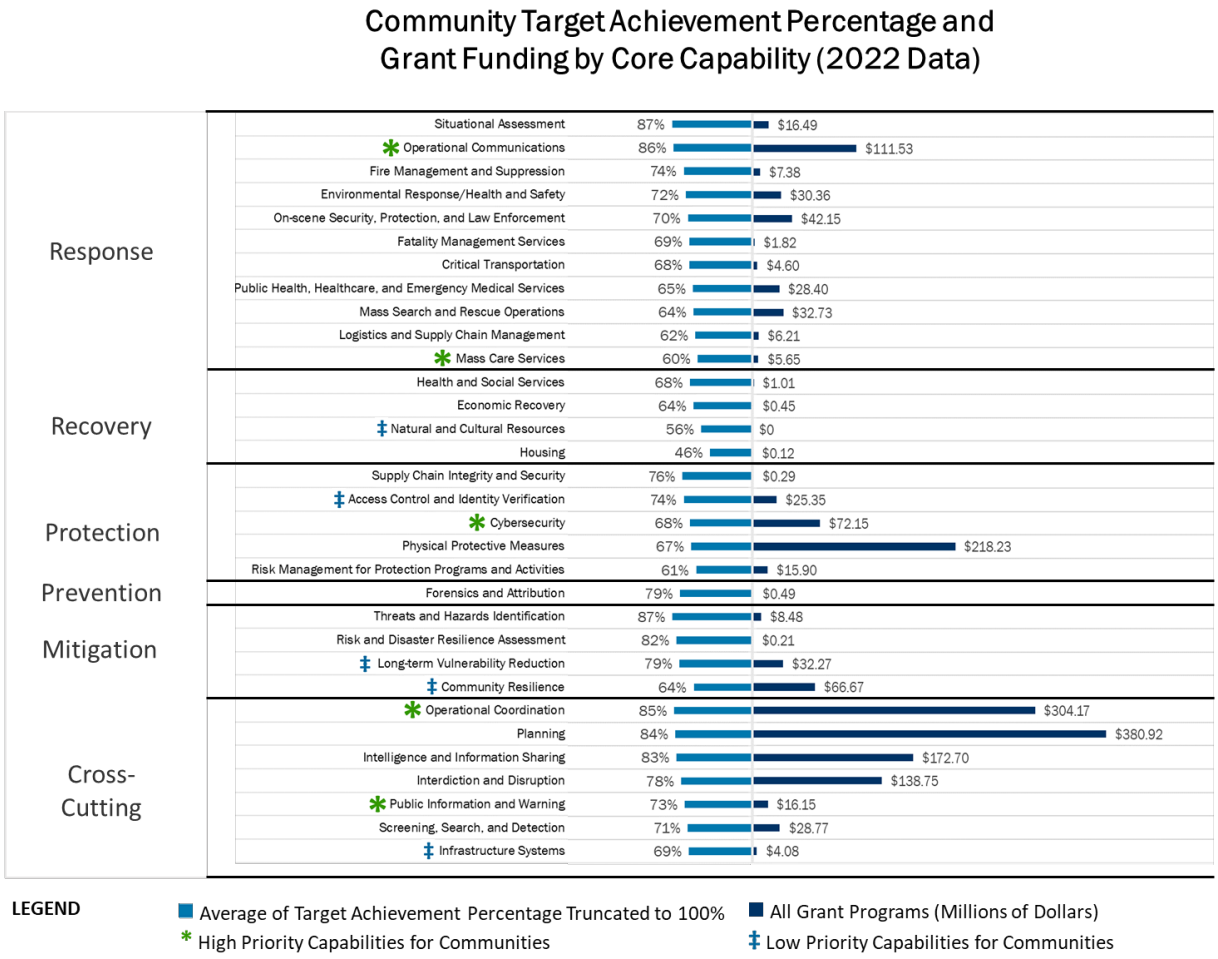


Figure 8: The relationship between grant program investments and average THIRA/SPR capability target achievement in 2022, organized by core capabilities and mission area.[xi,xii]

In the Response mission area, communities report low levels of grant investment (less than $7 million) and lower target achievement (less than 65 percent) in Mass Care Services and Logistics and Supply Chain Management. Communities also consider Mass Care Services a high priority capability. These capabilities, along with three of the four Recovery core capabilities, fall within these ranges and may warrant that communities increase their grant investments.

8. National Preparedness

In 2022, FEMA, in coordination with SMEs from across the federal government, completed an assessment of its capabilities to respond to catastrophic threats and hazards. Known as the National SPR, this assessment summarizes high-level trends in capability gaps—determined by these SMEs—across planning, organization, equipment, training, exercise, capacity, and coordination areas for the

selected core capabilities and national capability targets. **Table 1** summarizes high-level gaps and recommendations at the national level across all core capabilities.

Table 1: National-Level Capability Gaps and Recommendations Identified by National SPR Working Groups

Planning	**Preparing for Multi-State/Regional Incidents:** Plans should address state and regional planning and decision-making silos; competition for limited available resources; and population and commodity movements across borders. Plans should be inclusive of non-traditional partners to ensure a whole community planning approach and establish/maintain unified operations and partnerships.
	Exploration of Cascading Impacts and Dependencies Within Communities: Plans should address populations dependent on public transportation; public infrastructure dependencies across SLTTs; loss of tax base; panic buying/hoarding; and surrounding states receiving overwhelming amounts of evacuees.
	Policy, Guidance, and Governance: Plans should include frameworks for senior leadership on how to handle complex barriers during incidents; solutions to address evacuation hesitancy; and more federal guidance on 1) how to report information to senior leadership 2) hazardous materials (HAZMAT) detection and protective procedures for responders, and 3) evacuee tracking and reunification.
	Continuity Planning: Develop in-depth continuity planning between the multiple phases of emergency management.
Organization	**Adequate Staffing:** Federal, State, Local, Tribal, and Territorial (FSLTT) governments face challenges in employing and retaining enough skilled staff in a post-pandemic, resource-constrained environment, particularly for catastrophic incidents.
	Better Decision-Making: Increase training for senior leaders across FSLTT governments on how to make data-informed decisions using available and useful datasets.
	Strengthening Structures: Ensure unified command structures can address the size and scope of a multi-state catastrophic incident.
	Program Innovation: Ensure current programs are flexible and new programs incentivize FSLTT governments to participate in national-level exercises.
Equipment	**Specialized Equipment:** SLTTs should review and ensure their access to medical, HAZMAT, urban search and rescue, and dredging equipment, even if this equipment is rarely used. Law enforcement partners who have seen growth in their role in emergency management should acquire specialized equipment to assist in response missions.
	Power: FSLTT governments should examine short-term power contingencies and innovate other solutions for long-term power outages.
Training	**Communications:** Update communications-focused training programs to address gaps and ensure personnel are proficient in operational communications capabilities used during incidents and planned events.

Exercises	**Preparing for Multi-State/Regional Incidents:** Exercises should include competition for limited available resources across multiple impacted states, territories, and regions in conjunction with concurrent incident operations; en masse population and commodity movements across borders; evacuation route support; surrounding community reception, tracking, and reunification; and establishing and maintaining unified operations and partnerships across state lines.
	Communications: Exercises should assess and document operational communications functions, systems, and personnel to ensure the ability to communicate (e.g., alerts, warnings, notifications, emerging technologies, and backup communications systems) during incidents and planned events.
Capacity	**Economic Challenges:** Pre-existing or recent economic challenges or vulnerabilities exist nationwide (e.g., the ongoing housing crisis, depletion rate of resources during the pandemic, and increasing requirements for sheltering).
	Complex Incidents: Expand capacity for catastrophic incidents and augment resources via funding or contracts.
Coordination	**Cross-Sector Partnerships:** FSLTT governments and private and nonprofit sectors should strengthen coordination efforts for disaster response and recovery. These groups should coordinate with local level emergency management SMEs and partners who may not normally play a role in emergency management.
	Limited Capability or Adequacy: Increase storage in some areas for hazardous waste, build stockpiles for Protection or Prevention resources for responders, and upgrade equipment to advance capability and preparedness.

The key capability gaps and recommendations listed above represent some of the most pressing areas identified by federal emergency management SMEs for the federal government to address to better prepare the nation for catastrophic disasters.

The following sections of this report similarly focus on several pressing emergency management challenges and corresponding recommendations, but for the whole community. The "Focus Areas" section examines a subset of four core capabilities: Fire Management and Suppression; Logistics and Supply Chain Management; Public Health, Healthcare, and Emergency Medical Services; and Long-Term Vulnerability Reduction. Each core capability focus area includes an overview of associated risks, capabilities, and gaps. Each focus area also provides recommendations for FSLTT governments, non-governmental organizations (NGO)/Voluntary Organizations Active in Disaster (VOAD), the private sector, and individuals/households to help close capability gaps and build national resilience. These focus areas represent areas where: a) low average levels of capability target achievement exist, according to community SPR assessments, b) low levels of capability exist, according to the National SPR assessment, and c) disasters consistently challenge FSLTT capabilities.

Focus Areas

9. Fire Management and Suppression

Fire Management and Suppression "provide[s] structural, wildland, and specialized firefighting capabilities to manage and suppress fires of all types, kinds, and complexities while protecting the lives, property, and environment in the affected area."[13]

9.1. Risk

This core capability encompasses wildland and structural firefighting. Wildfires were the sixth-most frequently identified hazard in 2022 THIRA/SPR community submissions (communities could choose more than one threat or hazard).[4] In 2022, 35 percent of communities included wildfires in their THIRA submissions.[4] In 2022, wildfires caused $3.1 billion in damages to infrastructure including public facilities and private residences, communication towers, power grids, water utilities, and modes of transportation.[14,15]

Many regions across the United States are experiencing hotter and more intense wildfires, driven by the effects of prolonged drought and climate change.[16] Wildfires have resulted in "more than double the average annual acreage burned in the 1990s."[17] From 2013 to 2022, an average of 61,410 wildfires occurred annually, impacting an average of 7.2 million acres annually.[18] In 2021, over seven million acres burned across nearly 60,000 wildfires.[17] Between 2018 and 2021, wildfires caused approximately $22 billion in property damage and over $257 million in crop damage across several states.[19] The majority of these wildfires were avoidable; according to the Department of the Interior, nearly nine out of 10 wildfires are caused by human actions.[20]

More than 46 million individuals in 72,000 communities are vulnerable to significant wildfire exposure.[14] Wildfires create challenges for all forms of infrastructure, especially for residential areas in the wildland-urban interface (WUI). The WUI is where structures and undeveloped wildland often merge through the development of suburbs. WUI regions are more likely to experience property damage and wildfire safety risks.[14] WUI regions represent less than one-tenth of the U.S. land area, but are the site of 43 percent of new home development in recent years.[14] In 2021, nearly 6,000 structures burned because of wildfires,[18] and 60 percent (3,577) of these burned structures were residential.[21] The WUI is where structures and undeveloped wildland merge, and WUI regions are more likely to experience property damage and wildfire safety risks. The two types of WUI are defined by housing density interface (high-density development adjacent to undeveloped wildlands); and intermix (lower-density housing intermingled with undeveloped wildland).[14]

9.2. Capabilities and Gaps

In 2022 THIRA/SPR submissions, communities identified and associated numerous planning, organization, equipment, training, and exercise (POETE) gaps with wildfires.[xiii] These gaps include:[23]

- Limited inventory available for response efforts
- Staffing challenges
- Limited tracking data on fire parameters
- Lack of consistent public warning tools (i.e., alert systems) across jurisdictions
- Limited widely accepted interoperable (the ability of anyone to talk with whomever they need to, whenever they need to, when properly authorized) data standards[24]
- Difficulties tracking evacuation route status efforts

Between 2018 and 2022, the number of communities reporting that they were closer to achieving their capability goals to manage fires decreased from 66 to 64 percent.[4] Fire Management and Suppression was not a reporting requirement for communities in 2020 and 2021, but was required in 2022.[xiv] Despite this reported decrease in capability achievement in 2022, grant investments in Fire Management and Suppression declined overall between 2017 and 2022.[xv,xvi] Decreased grant investments may pose challenges for SLTTs. These communities increasingly encounter far more equipment, cost, training shortfalls, and resource constraints when compared to federal firefighting agencies.[21,25] However, the recently enacted Bipartisan Infrastructure Law (BIL) aims to address climate change and enhance wildfire-resilient communities. The BIL allocates $5 billion over the next five years for federal wildland fire management. This funding is designated for both the Interior and Agriculture departments, both of which oversee wildland fire programs. Under BIL, USDA's Forest Service is allotted an extra $3.5 billion, while the Interior Department will receive about $1.5 billion for wildland fire management in the next five years starting in 2022.[26]

While the federal government holds responsibility for fire suppression, management, and mitigation across federal lands, SLTT governments are accountable for all non-federal lands.[21] In 2022, the Biden Administration implemented the Wildland Fire Mitigation and Management Commission, established under the BIL. The Commission convened for its inaugural meeting in Salt Lake City, Utah, to formulate federal policy recommendations and strategies for addressing wildfires in the Western U.S., with a mandate to submit a report to Congress within a year.[27] SLTT partners have jurisdiction over municipalities, WUI communities, and state and local forests or grass/rangeland on non-federal lands. They also support federal wildland fire operations for fire suppression and containment on federal lands. SLTT fire departments deal with increased economic expenses to procure the resources necessary for wildland fire management. These resources include the tools, expertise, and personnel to make wildland landscapes more resilient to increasingly common climate stressors such as drought or extreme heat.[28]

The U.S. Forest Service (USFS) encourages communities that actively manage wildlands to use methods such as chemical, biological, or mechanical fuel treatments or planned grazing to control and prevent fire spread and for WUI fires including urban fires or conflagrations.[29] The costs of active

landscape management have increased over the past several decades as the wildfire season grows longer and wildfires become more severe.[30] Managing large wildfires can require millions of dollars in equipment, hundreds of personnel, and adequate knowledge of terrain and local or invasive vegetation.[28] The risk of simultaneous or unanticipated, human-caused wildfires can further exacerbate funding and resource limitations. Challenges also exist with funding for local structural firefighting. Local fire departments handle multiple other duties, including search and rescue and post-disaster operations, and funding is vital for those initiatives to continue.

In recent years, SLTT governments have also faced challenges with planning efforts to address the access and functional needs (AFN) of individuals with disabilities, individuals with limited English proficiency, older adult, and those with limited access to transportation and/or limited access to financial resources for emergencies. Populations with AFN are at increased risk of death, injury, and disproportionately higher material losses during emergencies and will therefore continue to be an important area of focus for emergency managers.[xvii,32] Certain populations, including people with disabilities and people with limited English proficiency, have civil rights protections and require accessible and actionable emergency communication.[32,33] In addition, the percentage of the population who are older adults (who may not have access to the Internet or use technology as much as others) and individuals with disabilities will increase worldwide in the next decade.[34,35] By 2034, adults 65 and older will outnumber those under 18 in the United States for the first time, creating profound and unique challenges for the emergency management community.[36] For example, older adults are much more likely to die in disasters; more often have impaired mobility, cognition, or senses; have uneven access to resources such as the internet and income, and often have more limited social networks than younger populations.[37]

Given the complexity of challenges surrounding wildfire management, the federal government has played a large role in bolstering SLTT capabilities. In 2022, the U.S. Department of Defense (DoD) finalized the National Defense Strategy (NDS). The NDS directs DoD to prioritize closer coordination with interagency, private sector, and SLTT partners to enhance resilience at all levels. In 2022, over half the nation's National Guard members, operating in their state-status, responded to multiple incidents including wildland fires.[38] This transition will reduce interagency reliance on Defense Support of Civil Authorities and help build resilience across the firefighting community.

DoD Joins the Wildfire Coordinating Group

DoD joined the National Wildfire Coordinating Group (NWCG) as a member on December 1, 2022. Including DoD as an NWCG member is a critical step to enhancing interagency collaboration to prepare fire-adapted communities, provide safe and effective wildfire response, and increase mission and landscape resilience. In support of the NWCG mission, DoD and the National Geospatial-Intelligence Agency (NGA) are developing a plan to transition the FireGuard program—a tool developed by the NGA for DoD missions—from the National Guard and NGA to the National Interagency Fire Center. NGA implemented FireGuard to facilitate the analysis, sharing, and use of data from multiple sources and sensors, including imagery from satellites and unmanned aircraft, to produce sanitized, unclassified products for firefighters.

Another federal government initiative was the development of the Wildfire Risk to Communities website.[39] Wildfire Risk to Communities is a free, easy-to-use website with interactive maps, charts, and resources to help communities understand, explore, and reduce wildfire risk. Under direction from Congress, the USFS designed a tool to help community leaders, such as elected officials, community planners, and fire managers.[39] For the first time, the USFS mapped wildfire risk for communities nationwide.[39]

9.3. Management Opportunities

Table 2 summarizes the opportunities that FSLTT governments, NGOs, VOADs, the private sector, and individuals/households can leverage to manage risk, build Fire Management and Suppression capability, and address capacity gaps to increase their overall resilience.

Table 2: Fire Management and Suppression – Management Opportunities.

Stakeholder Group	Management Opportunities
Federal Government	• Continue access to funds for wildfire resiliency-building efforts through programs such as FEMA's Building Resilient Infrastructure and Communities (BRIC) program and the USFS Community Wildfire Defense Grant program.[40] • Leverage the establishment of the Wildland Fire Mitigation and Management Commission, to coordinate and generate comprehensive federal policy recommendations and strategies aimed at effectively addressing wildfires in the Western United States.[27] • Continue funding for FMAG. Requests for FMAG declarations may be approved by a Regional Administrator on an expedited basis (i.e., while a fire is actively burning and threatening such destruction as would constitute a major disaster).[9] • Strengthen federal coordination by better aligning agencies' goals for wildfire risk mitigation, which would support air quality improvements and reduced risks to public health from wildfire smoke over the long term.[41]
SLTT Governments	• Adopt stricter building codes and zoning across residential developments and commercial power (electrical utility) infrastructure, to include mandatory use of fire-adapted materials (depending on the level of risk).[6] • Invest in more training and specialized programs for firefighting and rescue operations.[4] • Increase communication and collaboration efforts with volunteer and career fire departments to promote a whole community approach to plan for, mitigate, and respond to high wildfire risks and support more fire-adapted communities.[4] • Engage with the DHS Office for Civil Rights and Civil Liberties for guidance on addressing the needs of vulnerable populations during wildfires and promoting community resilience.[42,43] • Encourage individuals and households to take research-based protective actions on FEMA's Protective Actions Research site to safeguard themselves and their property.[44] • Use data from the 2022 National Household Survey on Disaster Preparedness to better understand gaps and opportunities for wildfire preparedness.[5]

Stakeholder Group	Management Opportunities
	• Apply for Hazard Mitigation Grant Program (HMGP) Post Fire assistance for fire mitigation projects. States, federally recognized tribes, and territories affected by fires resulting in a FMAG declaration are eligible.[45]
NGOs, VOADs, and the Private Sector	• Protect critical transportation and communications infrastructure by replacing plastic culverts with concrete ones, and by completing proper defensible spaces around assets like cell towers.[46,47] • Form public-private partnerships with local governments, investors, and utilities to help invest in forest management, such as the Forest Resilience Bond, which assists in funding land management restoration projects.[xviii,48] • Mitigate power line vulnerability by removing trees near them and burying lines in high fire risk areas.[49] • Conduct thorough and regular inspections of all rail components and follow inspector recommendations to reduce rail-caused fires.[50] • Communicate risks associated with the improper use of portable generators to the public.
Individuals and Households	• Avoid activities involving fire or sparks when hot, dry, and windy conditions exist.[20] • Work together with neighbors to ensure that leaves, debris, or other flammable materials are not around homes. FEMA's Wildfire Protective Actions webpage provides more information on creating a defensible space around your home.[47] • Create a household evacuation plan and follow evacuation orders from emergency management and FSLTT government officials.[51] • Do not park in tall grass if authorities have issued a "fire weather watch" or "fire weather/red flag warning." Vehicles' exhaust systems are hot and can cause dry grass to catch on fire.[52] • Create copies of your documents and save them in a fire- and water-proof location or electronically.[52] • Gather supplies so that you have at least three days of emergency provisions on hand, including particulate respirator masks; non-perishable food; bottled, boiled, or purified water; weather-appropriate clothing; flashlights; first aid supplies; and prescription needs.[52]

10. Logistics and Supply Chain Management

Logistics and Supply Chain Management aims to "deliver essential commodities, equipment, and services in support of impacted communities and survivors, to include emergency power and fuel support, and the coordination of access to community staples; and synchronize logistics capabilities and enable the restoration of impacted supply chains."[13]

10.1. Risk

In previous years, communities identified Logistics and Supply Chain Management as a capability with middling target achievement. This continued in 2022, as slightly more than half (52 percent) of communities reported increasing their Logistics and Supply Chain target capabilities.[4] However, fewer communities identified this capability as a high priority than in prior years. 85 percent of communities

considered Logistics and Supply Chain Management a high priority in 2021 but only 58 percent of communities considered it a high priority in 2022.[4]

Activities under Logistics and Supply Chain Management include:[4]

- Managing transportation of materials from storage facilities and vendors to incident survivors
- Providing logistical support to firefighters and other first responders
- Coordinating the procurement of communications equipment and services
- Managing electronic data interchanges to allow for end-to-end visibility and tracking of response resources

Two ongoing challenges impede these activities—more destructive and frequent threats and hazards exacerbated by climate change and pre-existing vulnerabilities including aging infrastructure and a lack of storage space. Both factors can impede delivery of goods and services to emergency managers and disaster survivors.

In recent years, some of the most challenging threats and hazards to this core capability have included drought, flooding, and rising sea levels.[53] In 2022, abnormal drought conditions combined with record heat waves caused the Mississippi River's water levels to recede, nearly approaching the record low set in 1988.[54] The river receded to levels low enough for barges to get stuck in mud and sandbars, jeopardizing millions of tons of critical supplies that are transported via water from states in the upper and lower Mississippi River watershed. Ultimately, the U.S. Army Corps of Engineers had to conduct emergency dredging at points where as many as 2,000 barges plateaued.[54]

Since climate change will continue to make droughts along the Mississippi River more frequent, supply chain disruptions are likely to increase as well.[53,54] Rising sea levels associated with climate change will potentially expose other transportation and logistics infrastructure, such as seaports, to damage, disruptions, and delays. However, in a survey of 85 U.S. maritime infrastructure engineers, only 29 percent said their organization had a sea level rise policy or document.[53] This may indicate that nationally, many organizations have not planned for impacts related to sea level rise.

Navigable waterways and viable port infrastructure are both vital components of the nation's transportation and logistics infrastructure. If a catastrophic disaster occurred in the Mississippi River watershed region (e.g., a New Madrid seismic incident), FEMA could face logistical challenges in delivering supplies to survivors. Moreover, a disaster in this region impacting several states can create resource competition, leading to unequal distributions of supplies, delayed deliveries, and increased community vulnerability. In addition to these natural hazards, FEMA may face challenges with transportation and logistics due to vulnerabilities stemming from aging infrastructure, which are more susceptible to damage during disasters.[55]

The U.S. population has more than doubled since the 1960s when most of the nation's major infrastructure systems were designed and built.[56] Many systems are reaching the end of their lifespan and are dangerously overstretched.[56] Aging rail infrastructure, roads, locks and dams, and bridges can become slow-moving disasters that cause shipping delays, longer commutes, and pose risks to local

populations when they fail. For example, damaged and overcrowded transportation infrastructure can hinder first responders from delivering critical supplies and conducting lifesaving support activities—including evacuations and search and rescue operations—in a timely fashion. Similarly, failing infrastructure can cause cascading impacts that require first responders to transport and supply critical resources like generators and potable water for extended periods of time. For example, the August 2022 flooding incident in Jackson, Mississippi contributed to equipment failures at one of the city's two main water treatment facilities, leading to supply and sanitation challenges.[57] During this incident, the city's 150,000 residents faced several weeks without access to safe drinking water.[57] As a result, federal, state, and local government agencies distributed more than 11 million bottles of water to residents and brought resources in to complete emergency repairs to the plant and restore safe, reliable drinking water to the city.[58,59]

When disasters impact a large geographic area, states may find themselves competing with neighboring states to procure these critical supplies, prolonging response and recovery efforts. Furthermore, as more disasters occur at the same time in different parts of the country, otherwise distant states contend for the same limited resources. Hurricane season for the Gulf and Atlantic states in August and September overlaps with peak wildfire season for Western states during the fall months. This overlap can delay already scarce resources like generators.[60] In 2020, demand for portable air cleaners due to the COVID-19 pandemic reduced their availability for heavy wildfire smoke on the West Coast.[61] Simultaneous large-scale disasters with anticipated timeframes, like hurricanes or wildfires, can also divert supplies from less anticipated incidents and disasters, such as the severe flooding in Missouri and Kentucky at the end of July 2022.[62]

Another vulnerability in the U.S. supply chain is a lack of warehouse storage. U.S. storage facility space has decreased over the past several decades.[63] In recent years, warehouse storage reached near capacity because the COVID-19 pandemic contributed to a drastic increase in e-commerce, online shopping, and costs for transporting goods in the United States. All these factors drove companies to lease more warehouse space for storage.[64] Limited available storage and warehouse space can impact capacity building to respond effectively to disasters. Limited storage capacity can also increase costs and timelines for transporting critical supplies to impacted communities, exacerbating inequities, and prolonging recovery efforts. Finally, limited storage facilities around the United States can lead to emergency management budgetary strains, as renting additional storage space or transporting supplies over long distances can become expensive.

10.2. Capabilities and Gaps

In their 2022 THIRA/SPR submissions, communities reported that training and exercises related to Logistics and Supply Chain Management often lack local and federal partners who can identify internal and external capabilities and know how to request them.[4] For example, SLTTs need more federal guidance on how to incorporate impacts to U.S. ports stemming from sea level rise into trainings and exercises.[4] Doing so will help SLTTs better understand risks to their ports and surrounding communities and plan for how to mitigate or respond to these risks accordingly. Sea ports are subject to storm surges, ocean and river flooding, high winds, and tsunamis.[65] Adapting to the changing

climate requires increasing funding for port construction and repairs, which would increase resilience. In 2022 THIRA/SPR submissions, several states set goals to develop further exercises and training on distribution and stockpile management, procurement processes, sheltering, and resource management.[4]

Communities also reported gaps associated with standardizing training plans across jurisdictions and states that face similar disaster-related issues.[25] In the 2022 THIRA/SPR, 69 communities out of 130 (53 percent) reported training gaps, and 56 communities reported both planning and training gaps related to this capability.[4] Many SLTTs are working to create in-state Emergency Management Assistance Compact exercises but currently lack resources to do so. Emergency management workforces exhibit limited operational capacity and require additional funding to develop training and exercises. Many jurisdictions also have limited staff capacity, which creates issues with disaster response.[25] Limited workforce capacity can delay delivery of time-sensitive relief supplies to survivors and supply and equipment shortcomings compound this gap.

In the 2022 THIRA/SPR, communities commonly identified storage capability gaps due to limited warehouse capacity throughout the nation.[4] These capability gaps, coupled with more recent inflation and the increasing cost of renting storage, led to resource limitations for domestic supply chains. As U.S. industrial construction decreases annually due to increased interest rates, FSLTT solutions for expanding supply chain capacity will grow more important.[66] Inventory management negatively affects this core capability, especially for jurisdictions with limited financial resources.[25] Inventory limitations have an array of consequences for nearly all supply chain sectors. Underreporting and incomplete data availability impact the accuracy of inventory management.

Federal initiatives such as the 2022 Infrastructure Investment and Jobs Act and the Creating Helpful Incentives to Produce Semiconductors and Science Act showcase a growing push for revitalizing domestic production and strengthening supply chains.[67] Nevertheless, domestic manufacturing challenges highlight many of the national supply chain capacity gaps. Ongoing manufacturing gaps nationwide lead to inventory management, transportation, and capacity-building challenges. While accounting for around 20 percent of global consumption, U.S. raw and technological production has decreased steadily since the 1990s.[68] Today, the United States produces 10 percent of electric vehicles, 7 percent of lithium-ion batteries, 12 percent of semiconductors, and 4 percent of printed circuit boards globally.[69] Limited domestic production of these goods impacts supply chain resiliency and critical infrastructure systems. Increasing domestic production and capacity of consumer goods and advanced technology can minimize the disaster-related damages impacting the public and private sectors.[69]

Supporting measures that advance domestic technology production can help build capacity. Increasing domestic production can improve logistics capacity and lead to faster response times for the delivery of goods and services to affected areas. The increased availability of these critical goods like food, medical supplies, and water can help ensure the meeting of demands for natural hazards and limit associated long-term impacts on the private and public sectors.

10.3. Management Opportunities

Table 3 summarizes the opportunities that FSLTT governments, NGOs, VOADs, the private sector, and individuals/households can leverage to manage risk, build Logistics and Supply Chain Management capability, and address capacity gaps to increase their overall resilience.

Table 3: Logistics and Supply Chain Management – Management Opportunities.

Stakeholder Group	Management Opportunities
Federal Government	• Develop new guidance—and review existing guidance—to address the impact of sea level rise on port and other supply-chain infrastructure.[70] For example, the U.S. Climate Resilience Toolkit and the accompanying Technical Application Guide provide guidance on supply chain risks and resilience topics.[71,72] • Continue federal investments in U.S. ports, like the Port Security Grant Program and the Port Infrastructure Development Program (PIDP) administered by FEMA and the Maritime Administration respectively.[73] The PIDP is the largest investment in port reliability and efficiency in U.S. history, and such efforts continue to ensure the protection of port infrastructure and supply chain readiness.[62] • Promote water management practices that increase drought resilience among farmers and food supply chains.[75]
SLTT Governments	• Create training opportunities and partnerships with federal partners to fund whole-community initiatives and develop actionable projects, including leveraging existing resources like the Department of Energy's (DOE) Energy Emergency Assurance Coordinators (EEAC) program.[76] The EEAC program involves stakeholders from all levels of government and public utilities to share information with each other and their communities before and during energy emergencies.[76]
NGOs, VOADs, and the Private Sector	• Develop supply chain tools integrating real-time data that companies can leverage to facilitate coordination with partners and gain better visibility of all aspects of their products' lifecycles. This would enable companies to identify disruptions, mitigate impacts, and improve productivity.[77] • Improve data sharing capabilities with SLTT agencies to allow for timely responses to supply chain and logistics disruptions.[78] • Take FEMA's Organizations Preparing for Emergency Needs training to learn more about how organizations can identify risks, locate resources, and take preparedness actions, including how to mitigate disruptions to the supply chain.[44]
Individuals and Households	• Consider federal and state funding (e.g., Small Business Administration loans) for individuals and households that own small businesses to mitigate the impacts of supply chain bottlenecks.[79] • Obtain business insurance; insurance may be available from federal sources.[80] • Identify supplies already on hand, then gather enough supplies to last several days in the event of supply chain disruptions. Buy supplies slowly and do not buy more than you need.[81] • Use FEMA's *Are You Ready?* Guide, which offers comprehensive information and recommendations on preparing for different types of disasters.[81]

11. Public Health, Healthcare, and Emergency Medical Services

Public Health, Healthcare, and EMS aim to "provide lifesaving medical treatment via [EMS] and related operations and avoid additional disease and injury by providing targeted public health, medical, and behavioral health support, and products to all affected populations."[13]

11.1. Risk

In their 2022 THIRA/SPR community submissions, 52 percent of communities identified pandemics as a hazard of concern.[4] COVID-19 remained the most significant hazard through 2022, with the highest recorded case count of the entire pandemic peaking the second week of January 2022.[4,82] COVID-19 was either the underlying cause or a contributing factor in approximately 245,000 deaths between January and December, making it the fourth leading cause of death that year.[83] New and emerging diseases are also an area of concern. Antimicrobial resistant organisms continue to rise and threaten human, animal, and environmental health.[84] Increased use of antibiotics during COVID-19 led to an increase in healthcare-associated, antimicrobial resistant infections in U.S. hospitals.[85] In May of 2022, the world witnessed a global outbreak of monkeypox (Mpox), a rare disease endemic to several central and western African countries but previously unrecognized as a potential source of a global outbreak.[86] The Biden Administration implemented a targeted national Mpox vaccine strategy, scaled up decentralized testing, and continued provider education and community engagement across the country in response.[87] The U.S. Department of Health and Human Services (HHS) "communicated public health information about the virus to patients and health care providers, provided access and substantially increased supply of vaccines and treatments, and significantly expanded the availability of tests."[88]

Climate change can increase the likelihood of pandemics and epidemics.[89] Some studies estimate that the likelihood of a pandemic with a similar impact as COVID-19 increases by about 2 percent each year.[90] As climate change modifies natural resource availability and alters ecosystems, wildlife and pathogens share progressively limited spaces and interact in new and different ways. These increasingly shared habitats, coupled with impacted and limited resources, elevate infectious disease outbreak risks. These risks exist whether people have direct contact with animals or indirect contact through shared environments.[91] Existing infectious diseases, such as the rabies virus, are more likely to spread to new regions of the nation.[92] These areas may be unaware of prevention tactics and unprepared to respond or adequately contain these outbreaks. Novel interactions between animals and humans can also lead to existing diseases from other countries making their way to the United States.[92] Milder winters and extremely hot summers create the perfect conditions for insects like mosquitoes and ticks to reproduce, expand their habitats and spreading diseases, such as Lyme and West Nile virus disease.[88]

Besides its impact on infectious diseases, climate change can also stress public health sectors by creating or compounding chronic illnesses and emerging health challenges. Drought, flooding, and

algal blooms can all contaminate and pollute water sources, impacting water safety requirements and causing illness among individuals in affected regions.[93] Every year, waterborne diseases cause 7.2 million illnesses and $3 billion in healthcare costs.[94] Likewise, poor air quality and extreme heat can increase airborne allergens and pollutants, elevating the risk and severity of respiratory diseases like asthma, cardiovascular diseases, and type 2 diabetes.[95,96] Climate change can also affect the air we breathe indoors, where people spend about 90 percent of their time.[97] Severe weather and flooding may increase the number of homes affected by water damage and mold growth, and wildfire smoke can reduce indoor air quality.[98] Furthermore, inadequate ventilation indoors can promote the spread of infectious diseases, including the virus that causes COVID-19.[99]

The impacts of climate change can cause dramatic shifts in regional healthcare needs and exacerbate health and medical care inequities between advantaged and disadvantaged groups. For example, regions experiencing higher levels of air pollution could face higher demand for respiratory care. In southern California, a 2021 study concluded that exposure to elevated levels of $PM_{2.5}$ (fine particulate matter in the air that is 2.5 microns or smaller in diameter) from wildfire smoke can lead to increased respiratory hospitalizations from 1.3 percent to up to 10 percent, compared to 0.67 percent to 1.3 percent associated with non-wildfire smoke $PM_{2.5}$ exposure.[100] Similarly, regions experiencing more extreme heat may witness an increased demand for heat-related illness treatments. In Washington state, extreme heat in the summer of 2021 correlated with a "69-fold increase in emergency department visits for heat stroke, heat exhaustion, and exacerbation of chronic medical conditions."[101]

Shifting demands on healthcare personnel may hinder access to services through longer wait times and higher costs for care. Reduced access to healthcare services may heighten health disparities and diminish quality of care, resulting in poor health outcomes.[102] Weather-related hazards such as poor air quality and extreme heat disproportionately impact populations that already face inequitable health care access, lower access to public and human services, and poorer health outcomes before, during, and after disasters (i.e., underserved communities, communities with environmental justice concerns, and other at-risk individuals).[32] Vulnerable populations, especially the unhoused, elderly, very young, and those without access to air conditioning are more at risk of experiencing adverse impacts.

Healthcare Staffing Challenges and Impacts

The persistent shortage of physicians and healthcare professionals compounds these climate change-related challenges. By 2034, the Association of American Medical Colleges estimates a projected shortage of 37,800 to 124,000 physicians.[108] In addition, the American Association of Colleges of Nursing has identified a scarcity of nursing faculty due to limited higher education capacity as a contributing factor to the nursing shortage.[108] Pandemic-induced burnout among clinical staff contributes to this shortage, with 40 percent of doctors reporting burnout in 2022.[108] Nurses also experience burnout at nearly 49 percent.[108] Emotional exhaustion leads to medical errors, care delays, and professionals leaving the field. Hospital closures worsen the shortage, particularly in rural areas, limiting healthcare access for economically disadvantaged residents.[108]

In addition to climate change-related hazards, threats such as cyberattacks can also threaten public health. In particular, attacks against hospital systems hinder medical care.[103] For example, a 2020 cyberattack against the University of Vermont Medical Center necessitated surgery rescheduling, and delayed radiation treatments.[104] For a month afterward, employees did not have access to electronic medical records and other vital digital tools, and the attack cost an estimated $50 million. Over several months in 2022, the Federal Bureau of Investigation conducted a disruption campaign against the Hive ransomware group which attacked school districts, financial firms, hospitals, and critical infrastructure; impacting over 1,500 victims in 80 countries.[106] "In one case, a hospital attacked by Hive ransomware had to resort to analog methods to treat existing patients and was unable to accept new patients immediately following the attack."[106]

11.2. Capabilities and Gaps

In the 2022 SPR, communities identified gaps related to medical transportation, use of technology, equipment and staffing availability, communication and coordination, funding availability, and capacity building.[25] Communities frequently report medical staffing shortages; 62 out of 84 communities with public health organizational gaps identified staffing challenges, and seven of these specifically mentioned EMS understaffing. Several communities also reported healthcare staffing to be a widespread problem. In March 2022, 23 percent of hospitals across the nation reported a critical staffing shortage and a decrease of nearly 105,000 employees since February 2020.[107,108] Such understaffing at medical, EMS, and long-term care facilities can lead to poor patient care and outcomes, including a higher number of deaths.

FSLTT governments can leverage many different resources to expand public health sector capacity. These include federal resources available to SLTTs through HHS' Administration for Strategic Preparedness and Response (ASPR). Programs that augment staffing include the National Disaster Medical Systems, Disaster Medical Assistance Teams, and the U.S. Public Health Service (USPHS).[109,110] The Medical Reserve Corps (MRC) is another community-based, volunteer program that is supported at the national level by the MRC Office within HHS ASPR.[111] Multiple other HHS ASPR offices and components—including the Biomedical Advanced Research and Development Authority, the HHS Coordination Operations and Response Element, and the Office of Industrial Base Management and Supply Chain—support the development, procurement, and distribution or coordination of medical countermeasures, and the Strategic National Stockpile as part of the federal medical response infrastructure.

Furthermore, The Center for Disease Control and Prevention (CDC) has existing resources that SLTT officials can use when responding to public health emergencies. Specifically, the Community Assessment for Public Health Emergency Response (CASPER) offers real-time insights to inform public health officials and emergency managers regarding impacted communities during disasters.[112] CASPER provides household-level data which helps identify information gaps, allocate resources, and initiate public health action; facilitate disaster planning, response, and recovery activities; and assess community needs. Additionally, CDC's National Environmental Public Health Tracking site provides up-to-date data on real-time factors, including wildfire smoke and hurricane overlays, further enhancing

the agency's emergency response capabilities.[111] Public Health Emergency Preparedness (PHEP) grants are another critical source of funding for SLTT public health departments, which use PHEP grants to fund staffing and obtain technical assistance to build and enhance public health preparedness and operational capabilities. The CDC administers annual PHEP funding to all 50 states, eight U.S. territories, all freely associated states, and four large cities or counties.[113,114] Between 2021 and 2022, PHEP funding increased by 2.2 percent for a total of $651,488,620.[113] The American Rescue Plan also provides funding through the CDC for states and local communities to hire personnel, enough for 8,600 staff.[115] The federal government can support and collaborate with SLTTs by continuing to provide these and other targeted grant funds to enhance SLTT public health preparedness efforts.

Communities identified equipment as a persistent challenge for public health facilities in their 2022 THIRA/SPR submissions.[4] Public health facilities frequently face severe equipment shortages. Currently, the U.S. Food and Drug Administration (FDA) medical device shortage tracker predicts that cardiac equipment, intensive care unit supplies, blood testing supplies, and laboratory storage devices will be in short supply in public health facilities during the first two quarters of FY2023.[116] The FDA partners with state and local officials to mitigate medical equipment shortages.[116] Through the Federal Food, Drug, and Cosmetic Act, the FDA created a new supply chain program to try to help prevent shortages of medical equipment.[117]

Beyond physical equipment challenges, hospitals face increasing cybersecurity vulnerabilities as a result of unpatched medical devices, outdated software, and inadequate security features.[118] In 2022, U.S. healthcare organizations experienced an 86 percent increase in cyberattacks, averaging 1,410 cyberattacks per organization per week.[119] The "healthcare sector ranked second out of all sectors for the most cyberattacks in the U.S."[119] One of the ways hospitals can strengthen their cybersecurity resiliency—which was identified as a concern in 2022 THIRA/SPR submissions—is through federal grant programs. In September 2022, DHS released a Notice of Funding Opportunity detailing the State and Local Cybersecurity Grant Program, which provides targeted cybersecurity investments (including those in public health) for states, local governments, and U.S. territories.[120] Among other outputs, this program will help states establish state cybersecurity plans and provide funding for training, thus increasing SLTT governments' capabilities to protect against cyber threats.[120] Using this grant program, states and local governments can assist healthcare organizations with increasing their cybersecurity resiliency.

Community-based disease countermeasures developed over time are successful at controlling the spread of many illnesses. For example, vector-borne diseases are those which are spread by animals and insects such as mosquitos, rats, ticks, and fleas. Individual or community protection measures include applying insect repellent, using environmentally benign pest control measures, and getting vaccinated against diseases common in the area in which one resides.[121] CDC's Division of Vector-Borne Diseases assists with community-based countermeasures by discovering, detecting, and preventing vector-borne diseases; developing and improving diagnostic tests; funding state, local, and territorial health departments; and responding to threats.[122] As diseases wax and wane, so too does the demand for new disinfectants. In 2021, researchers at the University of Central Florida developed

a nanoparticle-based disinfectant that can continuously kill viruses on a surface for up to seven days.[123] Using the aforementioned community-based disease countermeasures, in addition to individuals masking in public when ill, can make the whole community safer from disease.

11.3. Management Opportunities

Table 4 summarizes the opportunities that FSLTT governments, NGOs, VOADs, the private sector, and individuals/households can leverage to manage risk, build Public Health, Healthcare, and EMS capability, and address capacity gaps to increase their overall resilience.

Table 4: Public Health, Healthcare, and EMS – Management Opportunities.

Stakeholder Group	Management Opportunities
Federal Government	• Support programs like the USPHS and the Hospital Preparedness Program under the Administration for Strategic Preparedness and Response, and the CDC's PHEP Cooperative Agreement. These programs bolster preparedness efforts at all levels of government, aiding in readiness for various public health challenges, such as infectious diseases and other threats and hazards.[124,114] • Review legislation to ensure that grants and federal programs account for the potential for emerging diseases, climate change impacts, and health equity. Additionally, legislative updates could require enhanced coordination between public health and emergency management partners to effectively address interdependencies and disaster consequences. • Leverage federal programs such as the FDA Resilient Supply Chain Program to prevent medical supply shortages in the future. This program increases FDA's capacity to disseminate supply disruption notifications for critical devices when a potential shortage exists, removes time limitations in emergencies, and requires manufacturers to develop risk management plans and identify alternate suppliers.[126] • Continue education and support for SLTTs to ensure awareness of the Cybersecurity and Infrastructure Security Agency's Priority Services program and access to priority telecommunications and restoration services during an incident or event.
SLTT Governments	• Leverage federal grants to increase hospital capacity and address staffing needs at public health departments. • Strengthen partnerships and communication channels between public health officials and their emergency management counterparts to ensure effective coordination in disaster preparedness, response, and recovery efforts. • Provide cybersecurity training and resources for hospitals and include them in exercises.
NGOs, VOADs, and the Private Sector	• Use the HHS Security Risk Assessment Tool to identify potential cybersecurity risks.[127] • Identify ways to mitigate staffing shortages at private healthcare centers, including hospitals, assisted living, and long-term care facilities.

Stakeholder Group	Management Opportunities
Individuals and Households	• Speak with a doctor about establishing a power outage plan for medical devices that need electricity and for refrigerated medicines.[128] • Prepare an emergency supply of prescription medicines (including for pets), backup power sources, and personal supplies to last at least three days.[129] • Follow public health guidance to decrease public health-related risks.[128] • Take FEMA's You Are the Help Until Help Arrives training, which prepares a person to act in emergency situations and provide lifesaving care before professional help arrives.[130]

12. Long-Term Vulnerability Reduction

Long-Term Vulnerability Reduction aims to "build and sustain resilient systems, communities, and critical infrastructure and key resources lifelines to reduce their vulnerability to natural, technological, and human-caused threats and hazards by lessening the likelihood, severity, and duration of the adverse consequences."[13]

12.1. Risk

In 2022, 71 percent of communities identified Long-Term Vulnerability Reduction as a capability with higher target achievement in their 2022 THIRA/SPR submissions.[4] Closing gaps related to Long-Term Vulnerability Reduction is a major challenge for communities, as it requires significant financial and political investment at all levels of government, spanning diverse, interconnected issues. Natural hazards such as winter storms, extreme heat waves, flooding, and human-caused threats like physical attacks and cyberattacks on critical infrastructure challenge Long-Term Vulnerability Reduction capabilities. Inconsistent adoption of updated building codes—combined with the increasing rate and longevity of severe disasters—compound these threats and hinder Long-Term Vulnerability Reduction.

Between 2018 and 2021, winter storms caused approximately $801 million in property damage across 35 states.[19] In December of 2022, an arctic blast impacted large areas of the U.S., causing low wind chill values, blizzards, heavy snowfall, and record-cold temperatures. During the arctic blast, more than 200 million people—about 60 percent of the U.S. population—were under a Winter Weather Advisory. The National Weather Service reported this was "one of the greatest extents of winter weather warnings and advisories ever."[131] The Tennessee Valley Authority, which provides power for ten million people in seven Southeastern states, experienced the highest 24-hour demand in its 90-year history on December 23, 2022. The peak demand that day was thirty-six percent higher than its average winter peak load of 22,600 megawatts.[132] The storm resulted in the deaths of 100 people; 41 deaths were recorded in the Buffalo, New York region, where snowfall exceeded 56 inches over five days.[133] The storm also hindered mobility, transportation, and emergency services across communities, leaving vulnerable populations, including seniors, homeless populations, and low-income families at risk.[131]

In addition to winter storms, extreme heat can threaten aging infrastructure systems and increase community and individual vulnerability. Waves of extreme heat cause building materials to overheat, leading to building maintenance and cooling challenges. This drains power grid capacity and heightens the severity and frequency of blackouts.[134] Concrete degradation on roads and runways due to extreme heat can cause transportation challenges and result in issues with timely restoration of power grids.[134] Extreme heat can increase crop mortality and decrease refrigeration capacity and water supplies, triggering increased food and health concerns for the general public.[134] Extreme heat can also exacerbate preexisting chronic illnesses and health burdens, causing 700 deaths and 9,200 hospitalizations annually, more than any other severe weather incident.[135,136] During the record-breaking 2022 heat waves, adverse health effects disproportionately affected individual vulnerability.[135] Recent New York City focused studies concluded that black (non-Hispanic) individuals are more likely to lack access to air conditioning and perish from extreme heat twice as frequently as other racial and ethnic groups in the city.[137,138] The ongoing threat of blackouts, limited air conditioning, and inaccessible water supplies caused by extreme heat can heighten vulnerability among individuals with chronic health conditions and increases risk of dehydration, heat exhaustion, and stroke for affected populations.[136]

Inland flooding, a byproduct of excessive rainfall that overflows rivers and damages communities, has become more common in the United States.[139] In recent years, significantly more rainfall has occurred in the Northeast and Midwest, leading to greater flood risks in those regions.[140] Inland flooding can damage infrastructure and economies, and harm or displace individuals in communities that are not equipped for such hazards.[141] According to the Fourth National Climate Assessment, inland flood damages cost more than any other severe weather incident, averaging $6.9 billion annually from 1964 to 2006.[142] In 2021, non-coastal flooding accounted for over $5.1 billion in property damage across all 50 states.[19] In 2022, a major inland river flood in eastern Kentucky caused 39 deaths, decimated entire communities, and caused significant financial damage for both businesses and individuals.[143] Evacuation efforts for displaced people necessitated over 600 helicopters and extensive swift water boat rescues. In Florida, inland flooding caused by Hurricane Ian cost insurers an estimated $57 billion and impacted communities miles from the coastlines.[144]

The nation's energy sector infrastructure is particularly vulnerable to natural threats and hazards. Nearly 70 percent of the national electrical grid is over 25 years old.[145] Record heat waves, winter storms, and drought are pushing aging electrical grids to their breaking points, impacting all regions of the United States.[146,147] For example, the December 2022 arctic blast greatly impacted many power-generating centers, leaving 6.3 million households without power during part of the storm.[133] In September of 2022, California's record-breaking heat waves sparked fears of blackouts and cascading impacts.[148] The California state government imposed its highest level of energy emergency, urging consumers to halt energy consumption for extended periods of time.[149] Power grids also remain vulnerable to physical attacks. In 2022, 163 physical attacks on U.S. electrical grids occurred, representing a 77 percent spike from 2021.[150] These attacks caused substantial economic damages and left hundreds or thousands of individuals vulnerable to disasters.[151]

As areas of the United States undergo desertification and experience rising sea levels and increasingly destructive storms, the most cost-effective way to safeguard people, livelihoods, and property from the effects of disasters is to adopt codes and standards—such as hazard-resilient building codes—that reduce risk, and promote smart land use to encourage development in safer locations, and save energy.[152] Building codes can provide insurance benefits for residents and improve a community's applications for federal mitigation grant funding, in addition to encouraging smart land use in high-hazard areas.[152] The United States spends billions of dollars each year rebuilding homes and other structures damaged or destroyed by hurricanes,[153] sometimes rebuilding the same structure more than once. For this reason, the Government Accountability Office (GAO) recommends that FEMA explore possible options to enhance property acquisitions[xix] in flood and other hazard-prone areas.[154] The GAO also recommends that Congress consider providing FEMA with the authority or direction needed to implement these options.[154] The benefits of property acquisition include eliminating flood-prone structures, reducing disaster response costs, and limiting the government's fiscal exposure to the flood insurance program.[154]

The inconsistent adoption of building codes is one of the most significant factors that compounds risk and increases costs from natural hazards. In the United States, two out of three communities need to incorporate the latest building codes.[155] Responsibility for building code adoption falls largely on SLTTs.

Modernizing Building Codes

While the federal government can recommend implementing and designing building codes and developing incentive programs to encourage hazard-resilient buildings for communities, it plays almost no primary role in building code enforcement. In 39 states, less than 25 percent of the state's communities are covered by the latest hazard-resistant codes, which means that over 75 percent of communities in these states have not adopted the latest 2018 building code standards.[6] Modernizing building codes can lead to reductions averaging $162 annually on household utility and energy bills and promote long-term community resiliency.[6] On average, communities save around $1.6 billion in hazard damages by adopting modern building codes.[6] Communities that adopted 2018 or newer building codes anticipate saving about $132 billion through 2040.[6]

Communities that do not implement current building codes face elevated natural hazard risk impacts. This is especially true in the Midwest, New England, the Mid-Atlantic, and across much of the South, where a significant portion of building infrastructure predates building code standards. Floodplain risks, especially inland flooding, are ever-growing in these regions as novel weather patterns, erosion, and severe weather increasingly threaten communities with outdated building infrastructure.[156] Until recently, these regions' flooding, tornadoes, and similar hazards were historically infrequent. A 2022 study found that property and infrastructure damage increasingly occurs outside of the 100-year floodplain zones identified by federal mapping systems.[157] Buildings in these areas lack designs to withstand flooding, tornado, or hurricane impacts.[157]

12.2. Capabilities and Gaps

Building resilient systems, communities, and resources requires investing in capabilities to minimize long-term threat and hazard impacts at all levels of government. Some gaps in capability originate from jurisdictional limitations, especially with building codes and infrastructure. For example, the federal government can track building code adoption (e.g., FEMA's Building Code Adoption Tracker program)[158] and provide incentives and recommendations for creating or strengthening resiliency measures for SLTTs. However, since the federal government does not have the authority to enforce building codes outside of tying incentives for adoption to federal funding requirements, the responsibility to enforce building code adoption falls under the purview of SLTTs. This decentralization results in a wide variation in standards throughout regions and states.[159,6] SLTTs also tend to lack a centralized, state-wide report on building codes, and many municipalities lack the personnel and budget to analyze their capabilities comprehensively.[25] Some states have created mandates based on regional challenges. For example, California adopted building codes tailored for earthquake safety.[160] However, as disasters become more geographically unpredictable, non-standardization creates disaster recovery challenges and resource competition between jurisdictions.

An additional factor that will complicate efforts to build resilience on a national level is climate change. Infrastructure, which is already vulnerable to climate change impacts, will become even more vulnerable in the future. Incorporating natural hazard risk assessments into mitigation strategies can aid in a proactive adaptation that anticipates future climate change impacts; reducing the costs of climate change for the United States' road, rail, and coastal infrastructure by a factor of between three and six by 2090, compared with purely reactive adaptation.[161,162] Since 2021, the federal government has required federal agencies to reduce vulnerability to future climate change impacts such as flooding by preparing for and protecting federally-funded buildings and projects from flood risks through the Federal Flood Risk Management Standard.[163]

In 2022, the Administration announced 20 new actions taken by federal agencies to bolster the government's climate resiliency.[164] For SLTTs, ongoing disasters of growing magnitude and duration will likely continue straining the financial and personnel capacities of state and local emergency management institutions as climate change impacts increase. The federal government should define specific funding priorities to financially assist and support SLTTs in their climate transition planning. In addition, state mitigation plans are now required to consider equity and the impacts of climate change.[165] FEMA strongly encourages SLTTs to develop and adopt updated building codes to enhance mitigation and resiliency.[165] This holistic approach ensures that not only federal agencies but also state and local governments prioritize climate resilience and preparedness in building and infrastructure projects, acknowledging the crucial role of state-level mitigation efforts.[165]

Disasters can exacerbate long-term vulnerability for individuals and communities. In response, federal agencies created vulnerability reduction grant opportunities to strengthen recovery efforts for disaster-impacted communities. Grants developed by FEMA and the Department of Housing and Urban Development during the 1970s and 1980s, like the Community Development Block Grant Disaster Recovery (CDBG-DR) or HMGP, continue to be crucial programs for distributing funding to disaster-impacted communities.[166,167] These grants allow communities to start their long-term vulnerability

recovery process and promote hazard-mitigation strategies to reduce future disaster-related risks.[166,167]

Grant activities include housing recovery, economic development, restoring impacted infrastructure, resiliency and mitigation activities, and equipment repairs and purchases.[166] In FY2023, Congress appropriated $3 billion to assist in CDBG disaster incidents in 2022 or later, a $1 billion increase from FY2021.[168] The HMGP encourages applicants to strengthen their mitigation strategies by incorporating actions that reduce long-term vulnerabilities and link proposed actions to available federal assistance.[169] These grants highlight federal initiatives that attempt to remedy long-term vulnerability across communities and strengthen community-level preparedness. For detailed information on existing and currently available federal funding opportunities, please refer to Grants.gov.

Other disasters such as the COVID-19 pandemic have already complicated SLTTs' ability to pursue long-term vulnerability reduction initiatives. For example, during the pandemic SLTT communities had limited access to Long-Term Vulnerability Reduction training and exercises. Communities also often lack state and federal resources to develop Long-Term Vulnerability Reduction training, policies, and resource distribution, and limited outreach with whole community input occurs across jurisdictions.[25] There are limited Long-Term Vulnerability Reduction exercises at the state and local levels. These exercises include educating local critical infrastructure managers and engineers on the value of updating building codes through cost-benefit analysis, and building code regulatory engagement with feedback from nonprofit and private sectors.[25]

Data sharing and communication challenges across federal and SLTT agencies are common capacity gaps.[170] Transparent, comprehensive, and timely communication, and data sharing between the public and private sectors remains important for preventing, protecting against, and mitigating the impacts of man-made threats such as active shooters and cyberattacks.[171] Poorly timed emergency messages can hinder public and private institutions' ability to ensure financial and personal information security across their enterprises.[172] Agencies across the federal government frequently collaborate on improving interoperable and operable communication efforts. All levels of government strive to develop and fortify resilient communication systems and networks during emergencies.

The Emergency Communications Division of the Cybersecurity and Infrastructure Security Agency (CISA) plays a vital role in ensuring continuity of operations during conditions such as cyberattacks, mass gatherings, severe weather, or incidents caused by human error. CISA promotes communication systems used by government officials and emergency responders for the safety, security, and resilience of the United States. When networks are degraded or congested, CISA provides three priority telecommunications services that allow critical personnel to communicate: Wireless Priority Service for wireless voice communications, Government Emergency Telecommunications Service for wireline voice communications, and Telecommunications Service Priority for repair and installation of organizations' critical voice and data circuits.[173] These priority services mitigate communication problems during emergencies. Data sharing and communication efforts, as outlined in CISA's Strategic Plan 2023-2025, should also continue to be pursued to close capability gaps.[174]

12.3. Management Opportunities

Table 5 summarizes the opportunities that FSLTT governments, NGOs, VOADs, the private sector, and individuals/households can leverage to manage risk, build Long-Term Vulnerability Reduction capability, and address capacity gaps to increase their overall resilience.

Table 5: Long-Term Vulnerability Reduction – Management Opportunities.

Stakeholder Group	Management Opportunities
Federal Government	• Require increased resiliency and energy efficiency standards across newly constructed residential properties under the CDBG-DR funds.[175] • Continue to improve comprehensive extreme winter weather and extreme heat advisories that incorporate whole-community feedback and buy-in across federal agencies. • Develop and socialize existing resources to assist with building code and infrastructure upgrades, cybersecurity, and training.[6] • Support state/local adoption of model building codes and retention of hazard-resistant provisions in those codes.[6] • Continue developing and enhancing environmental justice tools and initiatives across all federal agencies through Executive Order 14008, including the Climate and Economic Justice Screening Tool and Environmental Justice Scorecard, and Executive Order 14096.[176,32]
SLTT Governments	• Adopt model building codes and retain hazard-resistant provisions in these codes.[6] • Explore non-federal building code funding opportunities outside the scope of the BRIC program, including HMGP funding for retrofitting and construction projects and the Public Assistance Program for building code management and enforcement.[177] • Continue to work with local communities and state partners to develop a building code outreach and training strategy. • Explore funding opportunities to develop and strengthen technical assistance programs at the SLTT level, which reduce vulnerabilities for small businesses, rural communities, and vulnerable populations. Potential programs include the U.S. Department of Treasury's State Small Business Credit Initiative, and the U.S. Department of Agriculture's Rural Energy Pilot Program.[178,179] • Provide FEMA's Integrating the Needs of Children workshop, which promotes community planning, coordination, and integration of children's needs during emergencies.[180]
NGOs, VOADs, and the Private Sector	• Private sector builders should encourage clients to utilize up-to-date, hazard-resilient building codes, even when not required, to address consumers' growing concerns over disaster damages due to climate change and establish mitigation as a standard practice.[181] Furthermore, investing in up-to-date building codes saves money in the long-term by reducing disaster-related repairs. • Collaborate with FSLTT partners to promote up-to-date technology and strategies to promote vulnerability reduction measures. • Conduct vulnerability assessments and develop plans to mitigate gaps.

Stakeholder Group	Management Opportunities
Individuals and Households	• Become familiar with local risks (threats and hazards) before they occur and how to prepare for them. Leverage resources like Know Your Risk, Ready.gov, and the NRI. • Prepare a two-week emergency supply kit for all household members, including pets. Kits should include non-perishable food; bottled, boiled, or purified water; weather-appropriate clothing; flashlights and batteries; first aid supplies; thermal blankets; warming packs; prescription medicines; a battery-powered radio; and a small tool kit.[182] • When in doubt, throw it out. Discard food that has been exposed to temperatures 40 degrees Fahrenheit or higher for two hours or more, or has an unusual odor, color, or texture.[182,183] • Participate in a Community Emergency Response Team program, which educate volunteers about disaster preparedness for local threats and hazards.[184] • If eligible, apply for the Low-Income Home Energy Assistance Program to assist with lowering energy costs and reducing the risk of health and safety problems that arise from unsafe heating and cooling situations.[185] • Individuals and households that qualify should apply for the Weatherization Assistance Program, operated by DOE, to reduce energy costs by elevating the energy efficiency of their homes.[186] • Invest in home improvements including installing storm shutters, reinforcing roofs, and adding insulation to reduce vulnerability to climate change and natural hazards.[187] Talk with your local emergency manager and other community members to learn about local programs and funding.[187] • Reduce energy consumption by incorporating energy-efficient appliances, unplugging electronics when not in use, and reducing water usage.[188] Homeowners can apply for the Energy Efficient Home Improvement Credit for the two above recommendations, thus lowering costs for these improvements.[189] • Download FEMA's Emergency Financial First Aid Kit to help you organize important financial, medical, and household information.[190]

Conclusion

The 2023 NPR provides an overview of the nation's current disaster risk and capability landscape. Risks and capabilities inform emergency management decision-making and cannot be assessed independently in a vacuum. All levels of government need to work together to ensure disaster preparedness and resilience. Governments need to work with non-governmental partners and the private sector to ensure holistic preparedness and a full understanding of both the impacts of disasters and the capabilities needed to manage them. Through the National SPR, FEMA most frequently found that FSLTTs need to focus on areas like planning, organization, and financial and resource capacity.

FEMA identified several key findings impacting emergency management today, including the increased frequency, severity, and cost of disasters; high community-level risk; ongoing individual and household preparedness gaps; and lacking building code adoption. To help the emergency management community form a clearer picture of risks and capabilities, and provide more specific management opportunities, FEMA chose to focus discussion on a subset of four core capabilities this year. Discussions within the focus areas illustrate the interconnection of systems and the potential for stress in one area to cascade to others, especially during disasters. For instance, chronic health conditions within the population can worsen because of wildfires, pressure supply chains for medical supplies, and increase hospitalizations.

The 2023 NPR identifies potential management opportunities that the federal government, SLTTs, NGOs, VOADs, private sector, individuals, and households can use to build capability and address capacity gaps. These management opportunities, along with FEMA's analysis of national preparedness data and capabilities, inform the recommendations presented in this report, which include:

- Targeting investments towards Core Capabilities and Mission Areas
- Reducing all-hazards challenges through targeted actions and increased coordination
- Addressing national gaps to prepare for catastrophic disasters

Building community-wide resilience helps form the foundation for successful response and recovery efforts. By examining and approaching resilience holistically alongside partners, the emergency management community can increase disaster preparedness and take steps to decrease the impact of future incidents.

Diverse perspectives from the whole community bring fresh ideas and add to the accuracy and credibility of the NPR. Please feel welcome to email npr@fema.dhs.gov to provide feedback on this report or make suggestions for future reports. Though FEMA will consider all comments, respondents may not receive a reply to their submitted feedback.

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[i] Qualitative means non-numeric data and methods that emphasize descriptions, interpretations, and meanings.

[ii] Billion-dollar disaster figures are adjusted for inflation.[3]

[iii] For additional information on the National Risk and Capability Assessment and data limitations, please refer to the 2022 NPR Appendix C: National Risk and Capability Assessment and Methodology and Appendix D: Risk and Emergency Management. For information on risk and emergency management terminology, please refer to the 2017 DHS Risk Lexicon.

[iv] The THIRA/SPR Overview and Methodology can be found at https://www.fema.gov/sites/default/files/2020-06/fema_national-thira-overview-methodology_2019_0.pdf

[v] For the purposes of this report, geographic regions align to the parameters established by the U.S. Census Bureau for the 2020 U.S. Census. The Northeast region includes the communities of Connecticut, Maine, Massachusetts, New Hampshire,

New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and cities and tribes within these states. The South region includes the communities of Alabama, Arkansas, Delaware, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia and cities and tribes within these states. The Midwest region includes the communities of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and cities and tribes within these states. The West region includes the communities of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, and cities and tribes within these states. For the purposes of this report, U.S. territories were excluded from this analysis.

[vi] These scales are based on a composite score that is determined by several factors, including expected annual loss (EAL), Social Vulnerability, and Community Resilience. Composite scores of risk are not yet available for Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands, but will be available in the future. Census tracts and counties without Social Vulnerability or Community Resilience data are given a rating of "Data Unavailable." If a community has "Insufficient Data" to compute EAL or "Data Unavailable" for Social Vulnerability or Community Resilience, the community is given a Risk Index rating of "Insufficient Data." When a hazard type is not applicable or there are insufficient data for a community, EAL for that hazard type is simply not included in the community's final summation and scoring. Refer to FEMA's National Risk Index Technical Documentation for additional information.

[vii] The 12 preparedness actions and associated percent of survey respondents who took these actions include: Assemble or Update Supplies (33 percent), Document and Insure Property (25 percent), Get Involved in Your Community (10 percent), Know Evacuation Routes (28 percent), Make a Plan (41 percent), Make Your Home Safer (33 percent), Plan with Neighbors (12 percent), Practice Emergency Drills or Habits (16 percent), Safeguard Documents (29 percent), Save for a Rainy Day (36 percent), Sign up for Alerts and Warnings (46 percent), and Test Family Communication Plan (17 percent).

[viii] To determine the average target achievement rate by core capability, FEMA first examined the data and capped all target achievement data values that were over 100 percent to a maximum value of 100 percent to avoid overestimations of target achievement capability. Afterwards, FEMA grouped actual community target achievement percentages by core capability, and then averaged those values to develop the average target achievement percentage for each core capability. Public Assistance and Individual Assistance are not factored into this graphic.

[ix] All core capabilities listed within the "Cross-Cutting" area of Figure 8 apply to at least two of the five mission areas.

[x] Intelligence and Information Sharing is not applicable across all mission areas, only Prevention and Protection. All other core capabilities with the highest grant funding fall under the Cross-Cutting or Response mission areas except Threats and Hazards Identification, which falls under the Mitigation mission area.

[xi] Target Achievement Percentage is calculated for each target and community by dividing the current capability of the community for that target by the capability target goal they have set for themselves. In Figure 8, the Target Achievement Percentage for each community is averaged together and presented by capability target. In some cases, communities exceeded their goals, leading to Target Achievement Percentages over 100%, which skewed the average and made Target Achievement Percentages by capability target falsely high. To correct this, Target Achievement Percentages over 100% were truncated to 100% prior to averaging by capability target.

[xii] This figure is based on an analysis of funding sources including the State Homeland Security Program (SHSP), Urban Area Security Initiative (UASI), Nonprofit Security Grant Program (NSGP), Emergency Management Performance Grant (EMPG), and Homeland Security Grant Program (HSGP). Some of the federal grant funding amounts in this graphic may appear low for several reasons. First, these grants do not necessarily focus on specific core capabilities. Second, not all grants (e.g., hazard

mitigation grants) are included in this list and specific core capabilities may receive targeted funding from sources other than the grants listed above, which this graphic does not capture.

[xiii] Functional areas are a key component of emergency management operations and are organized around a specific set of activities. Functional areas are often used to group related activities and resources needed to accomplish emergency management objectives. The National Incident Management System (NIMS) framework identifies five functional areas: 1) Command and Management, which involves establishing an organizational structure and process for overall incident management, direction, and control; 2) Communications and Information Management, which encompasses managing information and communication systems, equipment, and protocols during an emergency; 3) Operations, which involves the coordination and management of the on-scene response activities, including resource management, logistics, and operational planning; 4) Planning, which focuses on developing and maintaining plans, collecting and analyzing data, and making decisions based on situational assessments; and 5) Logistics and Resource Management, which involves acquiring and allocating resources, maintaining inventories, and providing facilities and support services during an emergency. These functional areas provide a common language and structure for emergency management activities and help ensure that all necessary functions are covered during an emergency.[22]

[xiv] FEMA increased the number of targets states, territories, and UASIs were required to assess in the 2022 THIRA/SPR to 33 (from 15 in 2021), including expanding some targets and/or decreasing capabilities. Tribal nations are only required to assess 12 targets.

[xv] FEMA funds fire management programs not included in THIRA/SPR reporting (i.e., the Staffing for Adequate Fire and Response [SAFER] and Assistance to Firefighters Grant [AFG] programs). As of July 31, 2023, from 2017 to 2022, the SAFER grant program and the AFG program released $1,895,643,892.51 and $1,885,770,481.65 of funding, respectively.

[xvi] Grant funding sources for Fire Management and Suppression include the State Homeland Security Program, Urban Area Security Initiative, Operation Stonegarden, Nonprofit Security Grant Program, and Emergency Management Performance Grant.

[xvii] The term “vulnerable population” is defined by the same metrics present in the 2022 NPR: “Populations that are less likely to be able to prepare for hazards; less likely to receive or be able to respond to warnings; more likely to die, suffer injuries, and have disproportionately higher material losses; have more psychological trauma; and face more obstacles during phases of response and recovery.”[31]

[xviii] This statement does not constitute a federal endorsement of investment in this or any other particular financial instrument.

[xix] For property acquisitions, FEMA provides funding for communities to purchase flood-prone properties and convert the land to undeveloped/green spaces.