Lessons Learned from Prior Oversight of the EPA's Disaster Response Efforts

August 27, 2025 | Report No. 25-N-0054

OFFICE OF INSPECTOR GENERAL
U.S. ENVIRONMENTAL PROTECTION AGENCY

This Report Is Part of Our Lessons Learned Series

The U.S. Environmental Protection Agency Office of Inspector General conducts audits, evaluations, and inspections to determine the efficiency and effectiveness of Agency operations and programs. To fully capitalize on our body of oversight work, we may analyze previously issued reports that address similar programs, processes, appropriations, or other topics to identify overarching themes and systemic issues. Our resulting lessons learned reports aim to help the Agency avoid historic pitfalls in its current and future efforts. This lessons learned report focuses on the EPA's preparation for and response to natural disasters, which have become costlier and more frequent over the past several decades.

Abbreviations

EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
GAO	U.S. Government Accountability Office
OIG	Office of Inspector General

Cover Image

The EPA responding to the Los Angeles wildfires. (EPA image)

EPA Office of Inspector General
1200 Pennsylvania Avenue, NW (2410T)
Washington, D.C. 20460
(202) 566-2391
www.epaoig.gov

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August 27, 2025

MEMORANDUM

SUBJECT: Lessons Learned from Prior Oversight of the EPA's Disaster Response Efforts
Report No. 25-N-0054

FROM: Nicole N. Murley, Acting Inspector General Nicole N. Murley

TO: David Fotouhi, Deputy Administrator

This is our report on the subject project conducted by the U.S. Environmental Protection Agency Office of Inspector General. The project number was OA-FY25-0054. This report does not contain any findings or recommendations. For that reason, the Agency is not required to respond.

If the Agency submits a response, however, it will be posted on the OIG's website, along with our memorandum commenting on the Agency's response. The Agency's response should be provided as an Adobe PDF file that complies with the requirements of section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that the Agency does not want to be released to the public; if the Agency's response contains such data, it should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epaoig.gov.

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Purpose and Overview

The U.S. Environmental Protection Agency Office of Inspector General initiated this project to describe the lessons we have identified from select EPA OIG and U.S. Government Accountability Office, or GAO, oversight reports to help inform the EPA's future efforts to prepare for and respond to natural disasters.

We reviewed 26 EPA OIG and GAO reports, listed in Appendix A, that include findings related to the EPA's prior disaster response actions. From those, we identified seven programmatic themes: (1) interagency and external stakeholder cooperation, (2) risk communication to the public, (3) data collection and characterization of risks, (4) policy development, (5) resource limitation, (6) contract management, and (7) resilience of contaminated sites and infrastructure. This report addresses the themes in the order of their frequency in the reports reviewed. Under each theme, we detail specific lessons for EPA to consider as the Agency and its partners prepare for and respond to natural disasters.

Since the nation has experienced an increase in the number of significant natural disasters, along with associated costs and human health-related impacts, the Agency can use this information to address historical and emerging challenges, which will better position it to achieve programmatic responsibilities while also ensuring fiscal responsibility. For example, 14 reports stated that cooperation between the EPA and other government agencies could be improved by clarifying roles and responsibilities or conducting interagency exercises, both of which could ensure a more effective overall response. As another example, four reports stated that existing infrastructure, such as contaminated sites, water treatment facilities, or drinking water systems, needs to be made more resilient to natural disasters. These reports described that the EPA should improve the capacity and resilience of small, rural drinking water systems or provide more technical assistance to facilities to ensure that risks are minimized, as vulnerable infrastructure could increase risks to the public and environment.

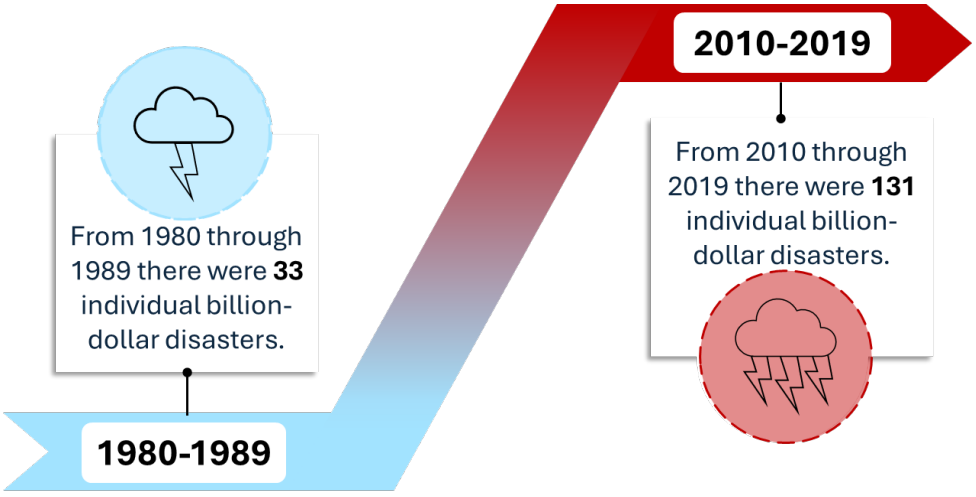
In total, the 26 reports we reviewed contained 79 recommendations to the EPA. As of May 2025, there were no OIG recommendations from these reports that were open. However, there were 16 GAO recommendations that were still open and unimplemented. These open recommendations are related to managing risks from natural disasters at treatment, storage, and disposal facilities; mitigating risks from wildfire smoke on air quality and public health; and ensuring facilities that make, use, handle, or store hazardous substances are properly reducing risks from natural hazards. If the EPA implements these corrective actions, it could be able to provide more efficient and effective disaster responses.

Background

Natural Disasters and the EPA

Twenty years ago, Hurricane Katrina made landfall and is the most expensive hurricane in U.S. history, causing an estimated $201 billion in damages and resulting in 1,833 fatalities. Data from the National Oceanic and Atmospheric Administration collected from 1980 through 2024 indicates that significant natural disasters have increased in frequency, scope, and cost. The EPA has historically relied on these data to understand the environmental and economic challenges posed by natural disasters. Based on these data, from 1980 through 1989, there were 33 billion-dollar natural disasters that cost an average of $22 billion each year, as shown in Figure 1. In contrast, from 2010 to 2019, there were 131 billion-dollar natural disasters that cost an average of approximately $100 billion each year. From 2022 through 2024, there were 73 billion-dollar natural disasters that cost an average of approximately $154 billion each year.[1] Governmentwide action is needed to respond to these disasters. In February 2025, the GAO's High-Risk Series—which highlights areas in the federal government that need change or are highly susceptible to fraud, waste, abuse, and mismanagement—identified a new high-risk area titled "Improving the Delivery of Federal Disaster Assistance." The GAO added this new area because natural disasters have become more frequent, noting that the federal government needs "to take government-wide action to deliver assistance efficiently and effectively and reduce its fiscal exposure."

Figure 1: Billion-dollar natural disasters



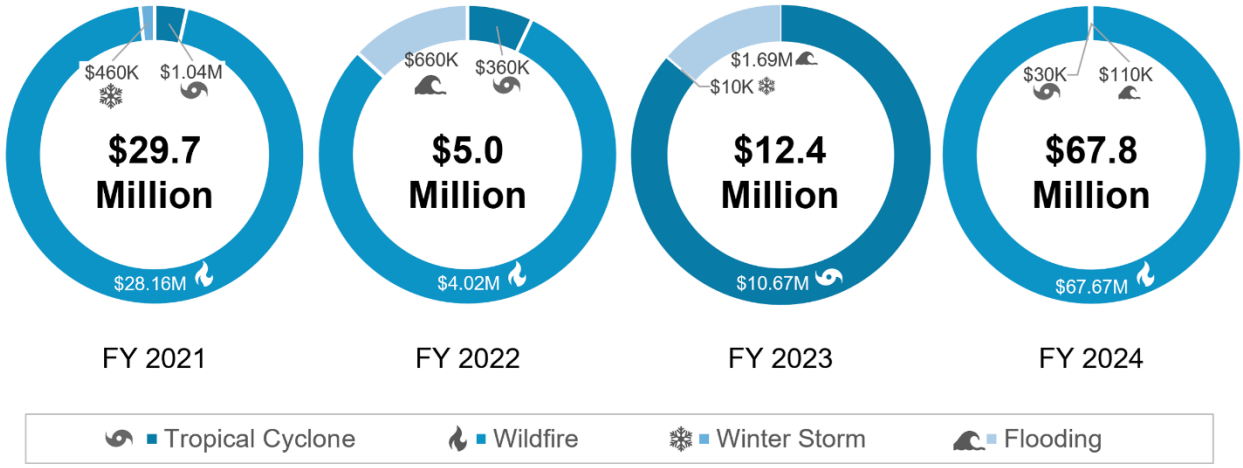
Source: OIG summary of data from the National Oceanic and Atmospheric Administration. (EPA OIG image)

Notes: All values have been adjusted for inflation. 2010–2019 information is represented in this graphic since this range represents the value most recently comparable to 1980–1989 available on the National Oceanic and Atmospheric Administration's website.

[1] All values have been adjusted for inflation.

Responding to natural disasters can be costly for the EPA. According to data provided by the Agency, the EPA spent about $115 million to respond to natural disasters from fiscal year 2021 through 2024, with an average of about $23 million per fiscal year. These values include contractual, payroll, and travel costs. As shown in Figure 2 below, there was a large increase in costs in FY 2024 due to the Hawaii wildfires.

Figure 2: The EPA's total costs to respond to natural disasters, FY 2021–2024



Source: EPA OIG analysis of data provided by the EPA. (EPA OIG image)

Note: Tropical cyclones include hurricanes, tropical storms, and tropical depressions.

In February 2025, the EPA administrator outlined the Agency's upcoming priorities, which consist of five pillars, including one titled "Clean Air, Land, and Water for Every American." This pillar states that the Agency will remain committed to ensuring that "emergency response efforts are helping Americans get back on their feet in the quickest and safest way possible."

The EPA's Response Actions

The U.S. Department of Homeland Security's *National Response Framework* provides "foundational emergency management doctrine" for how the nation responds to all types of disasters and emergencies, including aligning key roles and responsibilities across governmental and nongovernmental entities. It describes the EPA's role for coordination in disaster response, which is to support environmental assessments, decontamination, and cleanup. Additionally, it states that in an oil and hazardous spill scenario, the EPA has statutory authority to respond.

We identified two recent examples that exemplify the EPA's roles and responsibilities during a disaster response: Hurricane Helene and the Los Angeles County wildfires. Hurricane Helene made landfall on September 27, 2024, in Florida as a category 4 hurricane and caused life-threatening flash and urban flooding. North Carolina was particularly impacted by flash floods. The hurricane caused an estimated $78.7 billion in damages and was responsible for at least 250 fatalities. According to an EPA press release dated March 27, 2025, the EPA provided support to the Federal Emergency Management Agency, or FEMA; the North Carolina Department of Environmental Quality; the U.S. Army Corps of

Engineers; and local health departments. The Agency's response included removing and processing hazardous material containers, assessing damage to drinking water and wastewater systems, testing private wells, and advising residents about boil water advisories. In early January 2025, Los Angeles County, California, experienced a series of wildfires that destroyed more than 12,000 structures and 40,000 acres. FEMA assigned the EPA the responsibilities of removing hazardous materials from areas affected by the fire and disposing of them, providing water infrastructure technical assistance, and helping with long-term recovery. An EPA press release dated February 26, 2025, announced that the EPA had completed its Phase 1 hazardous materials mission, which the Agency has said is the biggest wildfire cleanup it has ever conducted.

Source: EPA photos of the Agency responding to the Los Angeles wildfires. (EPA image)

Responsible Offices

In the reports reviewed, we identified multiple EPA offices with responsibilities connected to natural disasters. The reports included recommendations to the EPA's Office of the Administrator, Office of Air and Radiation, Office of Land and Emergency Management, Office of Water, Office of Enforcement and Compliance Assurance, Office of Mission Support, and regional offices.

Scope and Methodology

We conducted this project from April to August 2025. As it is a summary of prior oversight work, we did not follow generally accepted government auditing standards. However, we did follow the EPA OIG's quality-control procedures for ensuring that the information in this report is accurate and supported. Additionally, the *Quality Standards for Federal Offices of Inspector General* requires that our work

adheres to the highest ethical principles of integrity, objectivity, confidentiality, independence, and professional judgment, and we adhered to these principles in performing our work.

To answer the project objective, we used a list of keyword terms to search reports published from January 2000 to March 2025 and identified 26 reports issued by the EPA OIG and the GAO that pertain to the EPA's disaster response, as shown in Appendix A.[2] Some of these reports are over or nearly 20 years old but still contain lessons that may be pertinent to future natural disasters. In addition, we included reports relating to two other disasters—the World Trade Center collapse and the East Palestine train derailment—because they identify lessons that are relevant to responding to natural disasters. Our review of each report identified findings related to the EPA's disaster response actions. We conducted an analysis to identify recurring themes across all findings. We then provided specific lessons under each identified theme.

[2] Of the 26 reports identified, nine are related to the EPA's response to Hurricane Katrina.

Themes and Lessons Learned

1 Interagency and External Stakeholder Cooperation

Theme identified in 14 of 26 reports we reviewed

When a natural disaster occurs, response efforts may be coordinated at the federal, state, local, and private sector levels. Interagency and external stakeholder cooperation may be called upon following a disaster to identify recovery needs and achieve recovery outcomes. Within this theme, we identified three lessons learned for the EPA: (1) clarifying interagency roles and responsibilities, (2) ensuring adequate preparedness, and (3) collaborating with stakeholders during a response.

Clarifying Interagency Roles and Responsibilities

EPA OIG and GAO reports detailed how disjointed roles and responsibilities led to duplicative work, insufficient guidance on how to appropriately collaborate with other stakeholders, and uncoordinated strategies and goals. We selected the following two examples:

- A 2006 EPA OIG report stated that the coordination between the EPA and state and local officials, and the EPA and U.S. Army Corps of Engineers could have been better during the response to Hurricane Katrina. In the case of the EPA and U.S. Army Corps of Engineers, staff within these offices were unaware of each other's roles. In addition, the EPA and the State of Louisiana did not coordinate their efforts to determine the status of wastewater treatment facilities, which caused duplicative work. The OIG recommended that the EPA and U.S. Army Corps of Engineers have interagency meetings and establish coordination protocols.
- A 2023 GAO report stated that the EPA had not aligned some of its goals for wildfire risk mitigation with other federal agencies. The GAO stated that alignment of goals and strategies among the EPA, the U.S. Department of Agriculture's Forest Service, and the U.S. Department of the Interior could more effectively reduce public health risks from wildfire disasters in the future. As a result, the GAO recommended that the EPA should improve wildfire risk mitigation goal alignment with the Department of Agriculture and the Department of the Interior and establish joint strategies to meet goals.

Ensuring Adequate Preparedness

EPA OIG reports identified that the EPA had been successful at assisting stakeholders during some disaster responses because staff maintained positive working relationships with stakeholders, proactively communicated with impacted stakeholders prior to the disaster, and participated in preparation activities. However, an OIG report stated that the EPA had a limited knowledge of state

debris plans, which prevented the EPA from adequately assessing states' readiness to manage disaster debris. We selected the following two examples:

- A 2019 EPA OIG report stated that the EPA could improve its emergency preparedness following Hurricane Irma. Nevertheless, the report mentioned that because EPA Region 4 had a close working relationship with the Florida Department of Environmental Protection, both entities were better prepared to protect human health and water resources. To improve preparedness, the OIG recommended that the EPA finalize a disaster response standard operating procedure and carry out annual hurricane emergency response exercises with stakeholders.
- A 2016 EPA OIG report stated that the EPA was unaware of state disaster debris plans. This limited knowledge prevented the EPA from determining the adequacy of state plans and adequately assessing states' readiness to manage disaster debris. This type of situation could lead to a financial loss, as the OIG reported that debris "from natural disasters has contributed to contamination of at least one Superfund site, which has cost the EPA an estimated $55 million." The OIG recommended that the EPA create a plan to assist states with developing disaster debris management plans.

Collaborating with Stakeholders During a Response

Other EPA OIG reports highlighted how the EPA was successful at assisting stakeholders by providing technical support and assessing water facilities and systems, which allowed a quick return to operation. We selected the following two examples:

- A 2006 EPA OIG report released in the aftermath of Hurricane Katrina stated that the partnership among the EPA, the State of Mississippi, and other stakeholders resulted in 1,358 of 1,368 public water systems being assessed about two weeks after the hurricane. Additionally, the EPA significantly helped Mississippi's public water systems get aid from FEMA's Public Assistance Program. This report demonstrated how effective collaboration among the EPA, a state, and other stakeholders to assess water systems can lead to restoration of water services after a natural disaster.
- A 2006 EPA OIG report stated that the EPA provided quality and timely information regarding wastewater after Hurricane Katrina. The EPA provided Mississippi with "excellent quality" information and was quickly available to assist. The EPA also provided technical assistance to wastewater treatment facilities in Louisiana and Mississippi. Through the EPA's support, decision makers had the information needed to evaluate the potential risk of sewage exposure and take action to protect rescue workers and the public.

2 Risk Communication to the Public

Theme identified in 12 of 26 reports we reviewed

The EPA must effectively communicate risks to the public and stakeholders to ensure the protection of human health and the environment. Within this theme, we identified one lesson for the EPA: risk communication to the public.

Risk Communication to the Public

Prior reports demonstrated that, during some responses, the EPA successfully communicated risks to the public. Strategies included using multiple media types and understanding specific community needs, such as making information about health concerns available in multiple languages. However, some of the EPA's communications to the public were untimely, inconsistent, inaccessible, and unclear. We selected the following two examples:

- A memorandum summarizing the results of a 2023 EPA OIG inquiry stated that the EPA had held public meetings, sent out a newsletter every two weeks, and set up a center where residents could ask the EPA questions regarding the train derailment in East Palestine, Ohio. Although the EPA conducted these outreach activities, it can enhance its risk communication. The inquiry found that the EPA's communication for sampling and monitoring chemicals could be improved by explaining why and when it stopped sampling or monitoring, clarifying why it sampled or monitored certain chemicals, and indicating when measured pollutants exceeded screening levels.
- A 2007 GAO report on Hurricane Katrina noted that the EPA provided useful risk information to the public. However, the EPA's communications also included unclear and inconsistent information in flyers and public service announcements about exposure mitigation. The report stated that the EPA did not share some information with residents that would have been helpful for them to understand their health risks. The GAO recommended that the EPA develop clear and consistent information for exposure mitigation and protocols so that communications are timely and disclose relevant information.

3 Data Collection and Characterization of Risks

Theme identified in 11 of 26 reports we reviewed

According to FEMA's *National Disaster Recovery Framework*, data and analysis tools are helpful in planning for disaster recovery, evaluating damage, and assessing recovery progress. During a disaster response, the EPA may collect and interpret data to support decision-making and understanding health hazards to the public. Within this theme, we identified two lessons for the EPA: (1) improving air monitoring and (2) assessing sites and risks.

Improving Air Monitoring

Prior reports found that the EPA's air monitoring during some disaster responses did not include an adequate number of monitors, was not performed timely, or did not occur in areas where substantial building demolition and renovation happened. We selected the following two examples:

- A 2019 EPA OIG report stated that during Hurricane Harvey most hazardous air pollutant releases were missed by state, local, and EPA mobile air monitors. These oversights occurred because air monitoring was not initiated timely to assess the impact of toxic air emissions. These toxic air emissions were mostly due to industrial facilities shutting down and starting up in response to the hurricane and storage tank failures. The EPA could improve future air monitoring by developing guidance for emergency air monitoring in heavily industrialized areas.
- A 2007 GAO report stated that the EPA doubled the number of ambient air monitors in the New Orleans area prior to Hurricane Katrina. These air monitors measured ambient concentrations of air pollutants, including asbestos. However, monitors were not placed in areas undergoing substantial demolition and renovation. For air monitors to effectively detect asbestos releases, there must be monitors located next to demolition sites. Their absence was problematic because the data collected may not have been fully representative of asbestos exposures in some neighborhoods. The GAO recommended that the EPA develop and implement an asbestos monitoring plan.

Assessing Sites and Risks

Two prior reports noted that the EPA was able to quickly identify, prioritize, and assess sites or facilities that were impacted by a natural disaster. After a disaster, assessing facilities with potential contamination could reduce human health and environmental risks. However, other reports found that the EPA faced challenges when assessing exposure risks. For example, the EPA used questionable methods to characterize residential risks, was uncertain about which risk thresholds should be used, did not use consistent sampling protocols, or collected some samples that ultimately could not be used.

We selected the following two examples:

- A 2006 EPA OIG report stated that after Hurricane Katrina the EPA implemented methods that quickly identified, prioritized, and evaluated hazardous material releases. The EPA did this by (1) coordinating with stakeholders to assess potential environmental and human health impacts caused by the hurricane, (2) assessing contamination in sediment samples, and (3) assessing results of damage or releases at Superfund sites affected by the hurricane. The EPA also provided assistance to state agencies to prioritize underground storage tanks for assessment. To help ensure reliable and quality sampling data, the EPA developed a quality assurance sampling plan.

- A 2003 EPA OIG report on the World Trade Center disaster noted that a statement made by the EPA administrator that the air was safe to breathe was not fully supported by the data. Part of the problem with the data was that health-based benchmarks for asbestos and other pollutants did not exist. Health-based benchmarks are needed to identify exposures the public may experience during a disaster. As a result, the OIG recommended that the EPA develop procedures so that its communications pertaining to health risks and the environment have adequate support.

4 Policy Development

Theme identified in 10 of 26 reports we reviewed

Clear policies, including procedures and guidance, are imperative to ensuring a coordinated and effective disaster response. Although it is unrealistic for the EPA to create guidance for every possible natural disaster response scenario, having procedures and guidance already in place could help mitigate confusion and improve response times. Within this theme, we identified two lessons for the EPA: (1) defining roles and responsibilities within the Agency and (2) developing internal guidance.

Defining Roles and Responsibilities Within the Agency

Prior reports indicated that the Agency should have procedures and guidance in place that details the EPA's internal roles and responsibilities and includes local staff in its response plan. We selected the following two examples:

- A 2020 EPA OIG report stated that during preparations for Hurricanes Irma and Maria the EPA did not fully engage or specify roles for its local staff in Puerto Rico or the U.S. Virgin Islands, as the Agency's response plan did not include roles for local staff. An after-action report conducted by the EPA stated that local staff should be assigned roles and responsibilities to improve future disaster responses. The OIG recommended that EPA Region 2 develop and implement a supplement to its emergency response plan to include local EPA staff roles and responsibilities.
- A 2007 GAO report found that although following the World Trade Center disaster the EPA took steps to clarify its emergency response roles and responsibilities, it did not clarify roles and responsibilities specific to indoor contamination. This clarification matters because the GAO reported that, according to a 2004 Agency document, the EPA has "the lead responsibility for decontaminating affected buildings and neighborhoods" following a disaster and telling the public when it is safe to return to indoor areas.

Developing Internal Guidance

Prior reports highlighted the need for standard operating procedures and a formal "lessons learned" process for the EPA's disaster responses. We selected the following two examples:

- A 2019 EPA OIG report on the response to Hurricane Irma noted that the EPA completed its mission to assess water systems within 15 days and the state's drinking water and wastewater facilities were operating soon after the hurricane. However, the OIG found that Region 4's draft standard operating procedure for emergency response management was never finalized, and some EPA staff were unfamiliar with some of the region's emergency response protocols. The OIG found that EPA Region 4 Water Division's disaster response could be improved with proper

guidance. Specifically, a standard operating procedure "can provide a central source of information on how disaster responses should proceed and conclude."

- A 2022 GAO report stated that the EPA conducted lessons learned activities based on its response to the 2018 and 2020 wildfires in California, emphasizing that such activities could provide insights to improve work processes, quality, and cost-effectiveness. However, the Agency did not have "a formal lessons learned process with written guidelines for wildfire or other disaster responses that specifies when and what lessons learned activities should be conducted." The GAO identified other lessons learned activities that could be useful, such as tracking and implementing corrective action. The GAO recommended that the EPA "develop a formal lessons learned process with written guidelines for its disaster response that incorporates key practices."

5

Resource Limitation

Theme identified in 6 of 26 reports we reviewed

The EPA has a responsibility to respond to natural disasters. Although resources are not fully within the Agency's control, the EPA needs adequate resources to respond effectively and should direct its limited resources towards the Agency's highest priorities. Within this theme, we identified one lesson for the EPA: resource limitation.

Resource Limitation

The federal government offers resources and support following a disaster. Resource limitations may undermine the EPA's ability to properly prepare for and respond to natural disasters. We selected the following two examples:

- A 2020 EPA OIG report found that the EPA's response to Hurricanes Maria and Irma was delayed because of damage caused by the consecutive hurricanes. This situation resulted in not enough supplies–such as water, meals, medical kits, and tarps–being available for distribution. Additionally, EPA resources were limited since the EPA was assisting the Coast Guard elsewhere. Although these were not fully within the control of the EPA, the EPA may have limited resources and personnel for an effective response when multiple natural disasters occur in a short period of time.
- A 2023 GAO report found that the EPA did not have a coordinated agencywide program or dedicated staff and resources to help communities prepare for and respond to wildfire smoke. The report cited a 2022 report from the Office of Management and Budget that shows how wildfire smoke exposure could increase federal health care expenditures by between $128 million and $226 million per year by the end of the century. The report stated that the EPA could better ensure that the Agency directs limited resources toward its highest priorities.

6 Contract Management

Theme identified in 5 of 26 reports we reviewed

Following a major disaster, funds are made available to assist in disaster response and recovery, and some of these activities may be conducted by specialized contractors through contracts with the government. It is vital that these funds be managed to prevent fraud, waste, and abuse. Disaster-related contracting presents distinct challenges for the EPA given the pressure to deliver timely services while carrying out its mission. Within this theme, we identified two lessons learned for the EPA: (1) enhancing fund management and (2) mitigating risks.

Enhancing Fund Management

The EPA OIG has identified areas of improvement for managing contract funding and purchase card transactions. We selected the following two examples:

- A 2009 EPA OIG report stated that the EPA may have overpaid for 23 percent of rental equipment from contractors related to its response to Hurricanes Gustav and Ike. Factors that contributed to the overpayments were not receiving average purchase price data before signing a contract and not establishing a control board, which ensures that funds are protected from fraud, waste, and abuse. The OIG recommended that the EPA require contractors to provide average purchase price information, develop a system or process to identify and prevent overcharges, and expand its *Emergency Contracting Procedures* to include more information on control review boards.
- A 2007 EPA OIG report determined that the EPA's contract requirements made it difficult for nonincumbent businesses to win the contract, which may have prevented the EPA from receiving the best value for its money. To prevent the issue from recurring, the EPA planned to award two national blanket purchasing agreements to provide emergency response technical support and logistical services, such as food, housing, and facilities. According to the EPA, a blanket purchasing agreement would allow for greater flexibility in addressing future natural disasters.

Mitigating Risks

EPA OIG and GAO reports have identified ways that the EPA can mitigate contracting risk following disasters. We selected the following two examples:

- A 2006 EPA OIG report found during a review of a limited number of invoices that contractors overcharged the EPA $18,298 in duplicate payments, $54,734 as a result of using inappropriate indirect cost and labor rates, and $110,843 in inappropriate boat rental costs in response to Hurricane Katrina. The OIG recommended that the EPA provide additional contracting officers to

assist in the review of invoices and establish policy and procedures for reviewing contracts and invoices during a disaster.

- A 2020 GAO report stated that the EPA neither had a contracting workforce plan or assessment that addressed its disaster contracting activities nor had developed a fraud risk profile for purchase card use. During a disaster response, fraud risks may change, and it is imperative that agencies have effective internal controls to prevent risks such as fraudulent transactions. The GAO recommended that the EPA take additional steps to complete and document a fraud risk profile for its purchase card program in alignment with the GAO's Fraud Risk Framework and to ensure that the Agency has adequate data to allow it to analyze purchase card use in support of disaster response.

Resilience of Contaminated Sites and Infrastructure

Theme identified in 4 of 26 reports we reviewed

According to the GAO's Disaster Resilience Framework, understanding the relationships among infrastructure, the environment, and a proposed resilience project can reduce future risks. This understanding is especially critical for the EPA since water systems and facilities that store contaminated waste can be particularly vulnerable to natural disasters and could increase exposure risks to communities. Additionally, the GAO's 2025 High-Risk Series reinforces the lessons discussed below stating that the EPA has not provided training and technical assistance to manage climate risks to waste treatment, storage, and disposal facilities. Within this theme, we identified two lessons learned for the EPA: (1) increasing infrastructure resilience and (2) providing additional assistance.

Resilience

The EPA defines resilience as "a capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment."

Increasing Infrastructure Resilience

Prior EPA OIG and GAO reports have identified opportunities to increase the resilience of infrastructure such as contaminated waste sites and water systems. We selected the following two examples:

- A 2020 EPA OIG report found that rural water systems in Puerto Rico and the U.S. Virgin Islands lacked resilience during Hurricanes Irma and Maria to protect human health from contaminated drinking water. The OIG reported that this lack of resilience had persisted despite the EPA's efforts to improve compliance and capacity issues at these water systems in Puerto Rico. To improve resiliency, the OIG recommended that the EPA provide training, guidance, and assistance to small drinking water systems and that the Agency establish a process for small drinking water systems to apply for grants.
- A 2024 GAO report stated that over 1,000 facilities across the nation treat, store, and dispose of hazardous waste and many are vulnerable to flooding, wildfires, storm surge, or sea level rise. The GAO reported that natural hazards could lead to hazardous waste releases from these sites that could harm human health and the environment. Federal data have suggested that 68 percent of these facilities–over 700 facilities–may be at risk. To increase resiliency at these facilities, the GAO recommended that the EPA provide training and technical assistance, implement monitoring metrics, and identify and communicate financial resources from federal resilience funding sources.

Providing Additional EPA Assistance

GAO reports have highlighted the importance of the EPA providing assistance to facilities to manage risks from natural hazards to increase resiliency. We selected the following two examples:

- A 2022 GAO report stated that over 3,200 facilities covered by the Clean Air Act's Risk Management Plan provisions, which make, use, handle, or store hazardous substances, are in areas at risk of flooding, storm surge, wildfire, or sea level rise. These facilities face challenges, such as insufficient information and direction, in managing risks from natural hazards. To address these challenges, the GAO recommended that the EPA provide additional compliance assistance to these facilities on how to incorporate risks from natural hazards into risk management programs.
- A 2020 GAO report found that federal efforts to provide technical assistance to help drinking water and wastewater utilities manage climate risks were inadequate. Also, federal agencies did not consistently provide financial assistance for projects that could enhance resilience and limit future fiscal exposure. As a result, the GAO recommended that the EPA "identify existing technical assistance providers and engage these providers in a network to help drinking water and wastewater utilities incorporate resilience into their projects and planning on an ongoing basis."

Conclusions

We identified 26 EPA OIG and GAO reports published from January 2000 to March 2025 that identified strengths and areas for improvement in the EPA's preparedness and response to disasters. In our review of these reports, we found seven recurring themes. These themes had lessons that may allow the EPA to be better prepared for and respond to a natural disaster in the future. These reports made 79 recommendations to the EPA. Although we did not evaluate the timeliness or quality of the EPA's corrective actions to these recommendations, it is imperative that the EPA implement recommendations that could provide a more efficient and effective response to future natural disasters.

Appendix A

Oversight Reports Reviewed

Report title	Report number	Report date
1. *Hazardous Waste: EPA Should Take Additional Actions to Encourage Treatment, Storage, and Disposal Facilities to Manage Climate Risks*	GAO-25-106253	11/14/24
2. *Results of Inquiry into the East Palestine Derailment*	N/A	9/25/23
3. *Wildfire Smoke: Opportunities to Strengthen Federal Efforts to Manage Growing Risks*	GAO-23-104723	3/13/23
4. *Household Hazardous Waste Removal: EPA Should Develop a Formal Lessons Learned Process for Its Disaster Response*	GAO-22-104276	3/17/22
5. *Chemical Accident Prevention: EPA Should Ensure Regulated Facilities Consider Risks from Climate Change*	GAO-22-104494	2/28/22
6. *Region 2's Hurricanes Irma and Maria Response Efforts in Puerto Rico and U.S. Virgin Islands Show the Need for Improved Planning, Communications, and Assistance for Small Drinking Water Systems*	21-P-0032	12/3/20
7. *Disaster Response: Agencies Should Assess Contracting Workforce Needs and Purchase Card Fraud Risk*	GAO-21-42	11/24/20
8. *Water Infrastructure: Technical Assistance and Climate Resilience Planning Could Help Utilities Prepare for Potential Climate Change Impacts*	GAO-20-24	1/16/20
9. *EPA Needs to Improve Its Emergency Planning to Better Address Air Quality Concerns During Future Disasters*	20-P-0062	12/16/19
10. *EPA Adequately Managed Hurricane Harvey Funding Received from FEMA*	20-P-0010	10/23/19
11. *Region 4 Quickly Assessed Water Systems After Hurricane Irma but Can Improve Emergency Preparedness*	20-P-0001	10/7/19
12. *EPA Region 6 Quickly Assessed Water Infrastructure after Hurricane Harvey but Can Improve Emergency Outreach to Disadvantaged Communities*	19-P-0236	7/16/19
13. *EPA Has Developed Guidance for Disaster Debris but Has Limited Knowledge of State Preparedness*	16-P-0219	6/29/16
14. *EPA Needs to Improve Cost Controls for Equipment Used during Emergencies*	10-P-0047	12/16/09
15. *Hurricane Katrina: Continuing Debris Removal and Disposal Issues*	GAO-08-985R	8/25/08
16. *World Trade Center: EPA's Most Recent Test and Clean Program Raises Concerns That Need to Be Addressed to Better Prepare for Indoor Contamination Following Disasters*	GAO-07-1091	9/5/07
17. *Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast*	GAO-07-651	6/25/07
18. *World Trade Center: Preliminary Observations on EPA's Second Program to Address Indoor Contamination*	GAO-07-806T	6/20/07

Report title	Report number	Report date
19. *New Housing Contract for Hurricane Katrina Command Post Reduced Costs but Limited Competition*	2007-P-00015	3/29/07
20. *Existing Contracts Enabled EPA to Quickly Respond to Hurricane Katrina; Future Improvement Opportunities Exist*	2006-P-00038	9/27/06
21. *Lessons Learned: EPA's Response to Hurricane Katrina*	2006-P-00033	9/14/06
22. *EPA Provided Quality and Timely Information on Hurricane Katrina Hazardous Material Releases and Debris Management*	2006-P-00023	5/2/06
23. *EPA Provided Quality and Timely Information Regarding Wastewater after Hurricane Katrina*	2006-P-00018	3/28/06
24. *EPA's and Louisiana's Efforts to Assess and Restore Public Drinking Water Systems after Hurricane Katrina*	2006-P-00014	3/7/06
25. *EPA's and Mississippi's Efforts to Assess and Restore Public Drinking Water Supplies after Hurricane Katrina*	2006-P-00011	2/14/06
26. *EPA's Response to the World Trade Center Collapse: Challenges, Successes, and Areas for Improvement*	2003-P-00012	8/21/03

Source: Summary of EPA OIG and GAO reports. (EPA OIG table)

Appendix B

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