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EXECUTIVE SUMMARY

The National Incident Management System (NIMS) guidance identifies the safety point of contact for disaster response to be fully cognizant of all potential hazards so that a time-critical emergency response plan can be implemented (Federal Emergency Management Agency [FEMA], 2022b). The steps leading to a thoroughly developed and functional plan include anticipating possible disaster causes, assessing hazard risks, and planning organizational and emergency community recovery response.

A disaster preparedness and emergency response plan is a core document for cultural heritage (CH) organizations, which include not only museums, art galleries, and historic houses but also academic teaching collections, industry-based exhibits and archives, archaeological sites, military battlegrounds, historic cemeteries, and culturally sensitive lands. Some CH organizations already have trained emergency response teams that include collections care professionals focused specifically on the recovery and preservation of their collections. Agencies such as the Smithsonian Cultural Rescue Initiative (SCRI) are members of FEMA’s Recovery Support Function Leadership Group and supports assignment to recovery mission deployment following lifesaving and life-sustaining response operations.

Climate change has altered the locations and intensity of emergencies, amplifying the need for CH organizations:

- To develop new disaster preparedness and emergency response plans where previously there may have been the perception one was not needed, and for existing plans to be reviewed, exercised, and updated routinely.

- To continually plan and prepare for damage to private and public property.

- To protect life and the environment.

Occupational and environmental health and safety (OEHS) personnel can help facilities to identify structural hazards, such as asbestos or lead-containing building materials, or mold growth after a flood, so that responders are aware and protected when entering a contaminated site post-disaster. Cultural heritage professionals can educate OEHS professionals on the risk-mitigation needs unique to cultural facilities and their collections, which contain hazards that safety professionals and emergency first responders may not be aware of. Those hazards include arsenic residuals, mercury vapor, carcinogenic dyes and pigments, and radioactive elements.

Both OEHS and CH professionals bring strengths and specializations to complete a robust and successful emergency response effort.

This white paper introduces OEHS professionals to the risk management needs of CH organizations, and to their well-established, nationwide organizations of CH professionals trained in cultural heritage emergency preparedness and response. It highlights the important collaboration of OEHS and CH professionals to integrate OEHS into their emergency management planning, training, and response. For CH organizations, this white paper introduces the knowledge, skills and abilities OEHS professionals provide in supporting the development and sustainment of their emergency response plans.
INTRODUCTION

This white paper seeks to build a mutual understanding for occupational and environmental health and safety (OEHS) professionals and cultural heritage (CH) professionals. CH organizations contain a multitude of hazardous materials in collections and in the facilities they occupy.

A professional collaboration will greatly enhance the goal of developing, implementing and enacting a disaster preparedness and emergency response plan, the term used by the American Alliance of Museums (AAM, 2022). Example wording of organizational plan titles may include disaster plan, emergency action plan, emergency preparedness and response plan, or incident preparedness plan. For simplification, “emergency plan” will be used in this white paper.

An emergency plan is a core document for CH organizations. CH professionals understand the benefits (and limitations) of planning for, responding to, and recovering from emergency or disaster situations, whether a leaky pipe or a devastating hurricane. Although many organizations (museums, for example) have an occupational hazard identification and management system, they may lack information concerning their emergency risks and how to control them in the event of an incident.

Moreover, many CH leaders and staff may not know how to find technical OEHS assistance to help them prepare for disaster scenarios and develop a response plan that addresses the hazards found in CH workspaces and their specific geographic environment. (See Other Considerations section for tips on locating OEHS resources.)

Although CH professionals may need knowledge of hazards inherent in the built environment, such as asbestos or lead, the OEHS professional must become familiar with the varied occupational and industrial tasks supporting both the organization and the unique collections hazards, in order to advise on planning for emergency situations. Both CH and OEHS professionals will benefit from a collaborative approach, because each group has complementary and exclusive skill sets that, when combined, form comprehensive and effective working partnerships.

Storage, exhibition, and collections or facilities maintenance areas may be of concern during an emergency event. CH facilities may house chemicals for conservation treatment, restoration, research laboratories, building operations and collections care tasks. These chemicals may constitute additional risk factors and could lead to a release of hazardous materials during and after a disaster. CH collections materials may contain high-hazard occupational risks such as heavy metals, carcinogenic dyes/pigments, silica, radioactive...
elements, toxic plants and alcohol-preserved fluid specimens. Work areas and maintenance operations that support the collections, exhibits and facilities also are sources of risk ranging from toxic heavy metals, woodworking dusts, asbestos, sharp or heavy materials, radiation, viable tissue cultures, and cryogenic (liquid nitrogen) specimen storage tanks.

The toxic hazards of the collections may be unknown to responders at all levels and to the community at large. This information on toxic hazards is particularly critical for those in charge of emergency preparedness, training, and response for a CH organization. With assistance from the OEHS professional—before, during and after disaster strikes—organizations can avert safety dangers and hazardous exposures.

In addition to knowledge of hazards in collection materials, the OEHS professional needs awareness of the well-established, nationwide organizations of cultural heritage emergency preparedness and response (CHEPR) volunteers: conservators and collections managers who are trained to respond to natural or human-made disasters. These trained professionals work in conjunction with all responders to support CH organizations facing common hazards and risks including unstable structures, contaminated water, and electrical hazards, as well as mold, animal attacks, toxic flora and other biological hazards.

CHEPR volunteers might specialize in supporting local community first responder organizations or teams representing personnel internal to their facility. Some of them, depending on potential community impact of the disaster, may be involved in an external response partnership with the U.S. State Department at international disaster sites. As a CHEPR partner, the OEHS professional is uniquely qualified in addressing certain hazards and will be instrumental not only in communicating with first responders about the unique hazards of the organization but also in acting as a liaison for first responders and CH professionals.

CHEPR Networks have a robust presence both nationally and internationally. (See Appendix B for a more complete list of CHEPR organizations and resources.) Examples of these groups include:

- The Heritage Emergency National Task Force, sponsored by FEMA and the Smithsonian Institution, for sharing training and resources with 60+ cultural organization partners
- The Foundation for Advancement in Conservation (FAIC) National Heritage Responders and Alliance for Response
- The Smithsonian Cultural Rescue Initiative, protecting cultural heritage threatened or impacted by disasters for both U.S. and international communities
- The Smithsonian Institution’s Preparedness and Response in Collections Emergencies team
- State-specific emergency systems, such as California Preservation and Disaster Networks, a part of the California Preservation Program (2022)

NIMS guidance identifies the safety point of contact for disaster response to be fully cognizant of all potential hazards at sites, so that a time-critical safety plan is ready for implementation (Federal Emergency Management Agency [FEMA], 2022b). Potentially impacted organizations include not just museums, art galleries, and historic houses but also academic teaching collections, industry-based exhibits and archives, archaeological sites, military battlegrounds, historic cemeteries, and culturally sensitive lands.

This white paper introduces OEHS and CH professionals with experience in and responsibilities for emergency preparedness and response to:

- what site and collection-specific hazard identification and mitigation controls must be addressed in CH emergency planning, training, and response,
- the importance for OEHS professionals to cross-connect with CH facilities and CHEPR networks in their locality, in order to add them to their contacts for OEHS training or site management, and
- the importance of integrating OEHS into CH emergency management.

A more detailed overview of emergency preparedness and response, including the FEMA processes and continuity planning, can be found in AIHA’s Technical Framework: Role of the OEHS Professional in Continuity Planning (AIHA, 2021a) and AIHA’s Technical Framework: Role of the OEHS Professional in Emergency Planning (AIHA, 2021b).

**PLANNING AND PREPAREDNESS**

The planning process is just as important as the plan itself. There is not just one way to build an emergency plan: each organization will establish the process that meets its needs. The principles of planning, however, remain the same (AIHA 2021a).

![Figure 1. Steps in the FEMA Planning Process.](image)

*Note. From Developing and Maintaining Emergency Operations Plans Comprehensive Preparedness Guide (FEMA, 2010)*
Preparedness is the process of identifying the personnel, training and equipment needed for a wide range of potential incidents and developing jurisdiction-specific plans for delivering capabilities when needed for an incident. (Figure 1; FEMA, 2010). All CH organizations are on an emergency preparedness continuum: some already have highly developed plans, while others may only be in the beginning stages.

Factors to Consider When Assisting Cultural Heritage Organizations to Plan and Prepare

OEHS professionals should acquaint themselves with specific safety and preservation requirements for the type of CH organization with whom they work. For instance, in order for a museum to receive professional accreditation from AAM (2022), it must meet certain core standards, including having an emergency plan. The National Park Service (NPS, 2006) also has specific guidance. The OEHS professional can also help the CH organization engage with community partners such as first responders and local offices of emergency management.

Successful planning depends on a number of factors, regardless of the type or size of a CH organization. These include personnel and financial resources; accuracy and detail of collections records; staff knowledge of the collections and their documented hazardous materials; deployment challenges (see Response and Salvage section); staff and volunteer participation in the planning process; and leadership support. A deficit in any of these factors can impact an organization's ability to actively plan for an emergency event (American Association for State and Local History [AASLH], 2021).

OEHS professionals should realize that all three of the following factors could be in play when reviewing, working with, or helping an organization to develop and implement its plan.

1. An organization’s emergency plan needs to be reviewed and practiced on a regular basis to ensure it remains relevant and reflects the current state of the organization.

2. Plans also must be updated whenever there is a change in staffing, renovations, and construction to the buildings, or any change that affects the information included in the plans.

3. Lessons learned and items for change will be identified through drills, exercises, and actual events. Results should be incorporated into emergency plans using a continuous improvement process (Figure 2).

Figure 2. Preparedness Cycle
Note: (AIHA, 2021a)
Planning Components: Examples for Cultural Heritage Scenarios

Each organization will undertake four essential steps within the planning process:

1. Conducting a risk assessment
2. Implementing risk mitigation
3. Establishing an emergency plan

The OEHS professional must first understand that any planning for emergencies is directly tied to the value of the collection. This is critical knowledge for the organization to use in risk assessment as well as during response (see Response and Salvage section). The organization should maintain a separate document of collection items, assessed as being of most value (not necessarily monetary) to the organization depending on its mission. In an emergency, these would be the items identified as high priority for packing, removal, recovery, and salvage.

1. Conducting a Risk Assessment

Assessment of risks from an emergency or disaster starts with the identification of all potential hazards, both internal to the site (factors within the organization's control) and external to the site (factors outside the organization's control). Internal risks include fires that could have been prevented by code-compliant protection or suppression systems, floods due to faulty plumbing or pipe leakages, pest infestations due to poor pest management, or infrastructure damage due to lack of earthquake protection. External risks include natural hazards, environmental impacts, and human-caused events. Risk factors also include structural material hazards and collections-based hazardous materials that may result in hazardous storage conditions.

An assessment will help to prioritize risks and enable planning for risk mitigation: the process and planning to reduce loss of life and property by minimizing the impact of disasters (Library of Congress, 2022; FEMA, 2020b). OEHS professionals working in collaboration with the organization staff may highlight additional areas of concern, such as the identification of hazardous materials within a collection, management of chemicals, restoration operations, and review of the building structure and infrastructure for unidentified risks.
Natural Hazards

The following examples of natural hazards are now occurring due to climate change (often due to the impact of human activities) in geographic areas where once they were rare. The OEHS professional should be familiar with the additional risks associated with the location of the emergency, based on the initial disaster. For example, a site near a large body of water may have a higher risk of flood damage than would occur due to an earthquake. A site in an industrial area may have a higher risk of petrochemical fire than would occur with flooding from a collapsed dam. Examples include:

Geological Hazards
- earthquake
- tsunami
- volcano
- landslide, mudslide, subsidence

Meteorological Hazards
- flood, flash flood, tidal surge
- water control structure/dam/levee failure
- drought
- snow, ice, hail, sleet, arctic freeze
- windstorm, tropical cyclone, hurricane, tornado, dust storm
- extreme temperatures (heat, cold)
- lightning strikes (wildland fire following)

Biological Hazards
- foodborne illnesses
- pandemic/infectious/communicable disease (e.g., avian flu, H1N1)

Site Environmental Impact Hazards

The OEHS professional must consider the additional risks created over time after the hazard’s initial site impact. The initial causative agent can also mix with other substances. Examples of these consequences include the following:
• OEHS professionals are familiar with mold and bacterial growth inside structures following a flood or high water. The initial hazard is water, and the external impact occurs due to standing water, with warmth and time enabling the growth of mold and bacteria.

• Water can also cause damage to chemical containers, resulting in chemical interaction and mixing, such as with gasoline, kerosene, and oil. Water can dissolve and interact with solid items, such as painted surfaces and metals salts, or react chemically to change the pH of the water to enable increased corrosivity.

• Likewise, serious risks include wild and domestic animals, especially in standing water. Floating and submerged debris may cause injury, trauma, slips and trips, and even drowning. Floods or high water may also contain biowaste or chemical contamination from damaged petrochemical plants.

• External impacts from any number of hazards such as fire, fast-moving or high-volume water; chemical or petrochemical explosions (e.g., initial and secondary risk such as broken propane mains and lines); or grain, ship, or silo explosions, create external or secondary hazards that must be considered and dealt with accordingly.

• Historic battlefields and monuments can be contaminated by nearby freight train derailments. Burial sites can be uprooted by earthquakes or floods.

Human and Technology-Caused Events

Existing accidental or intentionally negligent human-caused hazards, such as a possible radiation release from a nuclear power plant or a chemical release from a petrochemical plant, can be worsened when an additional emergency (hurricane, flood) is also occurring or imminent. Here are some examples:

Accidental

• hazardous materials spill or release

• nuclear power plant incident, if in proximity

• explosion/fire

• building/structure collapse

• entrapment and rescue efforts: machinery, confined space, high angle/heights, water

• transportation accident/incidents: motor vehicle, railroad, watercraft, aircraft, pipeline
Intentional

- robbery
- lost person, child abduction, kidnap, extortion, hostage incident, workplace violence
- demonstrations, civil disturbance
- bomb threat, suspicious package
- terrorism

Technology-Caused Events

- utility interruption or failure: telecommunications, electrical power, water, gas, steam, HVAC, pollution control system, sewerage system, other critical infrastructure
- cybersecurity: data corruption/theft, loss of electronic data interchange or ecommerce, loss of domain name server, spyware/malware, vulnerability exploitation/botnets/hacking, denial of service

Hazards in Heritage Structures

The composition of historic buildings and museums, just as with any old or modern structure, is a product of the manufacturing process and materials utilized at the time of their production—and possible alteration over the years (Wilson & Snodgrass, 2008). It is the combination of structural composition and contents of the heritage facilities or properties that add complexity to post-disaster planning and response.

As an illustration, a historic lighthouse now converted to a local museum or visitor education center probably contains asbestiform structural materials, lead-based paint, polychlorinated biphenyls (PCB) light ballasts and capacitors, and rodent and bird droppings with vector-borne pathogens. Local OEHS emergency planners might expect any of those to contaminate surrounding areas after a hurricane. However, OEHS professionals might not know that the historic light itself potentially may sit in gallons of mercury that provided smooth and balanced rotation for light transmission. Such a situation could contaminate the surrounding soil and expose responders to toxic mercury vapor.

Assessment Begins with Basic Questions to Facility, Collections, and Risk Managers

- When was the building constructed originally?
- Has it been remodeled? If so, did remodeling include asbestos, lead, and other hazardous material abatement, or did the architects keep the historic asbestos stucco or other hazardous material as part of the preservation process?
- Is there a site structure database that incorporates the original plans, the history of renovations and changes (including HVAC and other utilities), and past environmental or hazardous material surveys with records of remediation?
• Is the building poorly ventilated? Were the HVAC and fire protection systems upgraded to code, or are they substandard due to lack of funding or historic preservation concerns?

• What was the building’s history of use: what activities took place over time? Are there likely to be hazardous materials from those uses?

• How has the building been used since becoming a heritage property?

• Does the building house books and archives, which may develop mold quickly after being soaked in a flood?

• Do historic laboratories and manufacturing facilities still contain either radioactive instrumentation elements or degrading reactive chemicals, which might be released or even explode in a tornado?

• If the heritage property is an outdoor venue, what is the reason it is maintained? For instance, is this a battlefield site that might still contain unexploded ordnance? Is it an archaeological or paleontological site that is known to pose a coccidiosis risk when the ground is disturbed? Is it a cemetery, in which human remains might still contain viable pathogens?

• Is the site or property of a religious or culturally sensitive nature? For example, does the site represent burial remains? Is it reflective of the spiritual beliefs of community members? Response plans and actions may require understanding the religious beliefs and history of the cultural site, something beyond responding to a disaster in a purely routine manner.

**Hazards in Collection Objects, Specimens, and Their Storage or Exhibition Environment**

Collections may have been subject to treatments utilizing hazardous chemicals (arsenicals, mercuric chloride, naphthalene as pesticides/moldicides). In addition, collections may simply be hazardous by nature (hazardous botanicals, uranium minerals, gunpowder/explosives, old/degrading pharmaceutical collections) or by design (aniline dyes, asbestos art plasters in taxidermy mounts, sharp weaponry, flammable cellulose nitrate films, radium painted dials) (NPS, 1998).

Additionally, work processes within the organization may generate hazards—for example, use of alcohol or formaldehyde to preserve biological specimens, which are then stored in hundreds of jars, posing a flammability hazard after a disaster as shown in Figure 3.

Identified hazards can be classified with respect not only to risk-control measures but also in regard to measures to anticipate additional hazards resulting from fire, flood, or extreme physical damage. Importantly, the presence of hazardous materials does not necessarily increase the risk to emergency personnel.

This risk depends first on how the hazardous material is incorporated in the site, structure, object, or specimen, and second on the type and severity of the incident’s impact on these materials. For instance, arsenic-treated collections can release arsine gas in a fire. Although emergency personnel presumably will don appropriate self-contained breathing apparatus preventing such exposure, the emergency plan should identify these potential risks to facilitate appropriate response.
For a comprehensive listing of collections-based hazards and associated risk controls, see the Smithsonian Institution Safety Manual (2010) and Health and Safety for Museum Professionals (Hawks et al., 2011).

Collection Assessment Begins With Basic Questions:

- What are the nature and age of the objects or specimens? This question offers clues to risks, such as biodeterioration; unstable chemicals; culturally specific dyes or toxins on arrow tips; and radioactive mollusk shells collected downstream from a nuclear power plant.

- Do we have the original collector notes on preparation methods? For example, arsenic salts and mercuric chloride were popular for field and post-collecting use from 1600s until well into the 20th century.

- What do we know about pre- and post-collection treatments for conservation or preservation? This knowledge can include pest management using pesticides as well as cryopreservation of viable tissues.

- What hazard identification analytical testing data exists for the museum’s collections? Common methods include X-ray fluorescence, X-radiography, and radiation surveys.

- Is there information on hazardous materials in exhibits and collection storage areas that will need to be accessed post-disaster? The CH and OEHS professionals may have to conduct hazard analyses and document such information. For instance:
  - Many paints can be considered inert once applied. However, all paints should be evaluated for potential hazards during and following fire and high heat, especially if welding and gas cutting might be involved by responders or recovery personnel. If the paint can be identified or is known, the OEHS professional should consult safety data sheets for handling and disposal.
  - Military exhibits may include vehicles and equipment that have chemical (warfare) agent resistant coating (CARC) paint, which is isocyanate based and when exposed to high heat or flame from torch cutting or welding may convert to isocyanate fume and possibly cyanide.
  - Additives might include asbestos (strength additive), arsenic (marine paint), cadmium, lead, or mercury (biocide).
– Hazards on or within collections will potentially contaminate storage spaces, cases, flooring, and other surfaces as well as ambient air.

– Cases or older exhibit dioramas may be constructed of hazardous materials that should be identified in a risk assessment. Two examples:
  - Asbestos may be in backdrops, foregrounds, and light box insulation in old dioramas
  - Arsenic and mercury preservatives may also be found in natural history specimens on display; lead-based paint may be on backdrops

2. Implementing Risk Mitigation

Risk mitigation is the process of reducing loss of life and property by minimizing the impact of disasters. After identifying and prioritizing the hazards and vulnerabilities, short- and long-term strategies are developed to remediate those risks in order to protect people and property from similar events. Mitigation plans are key to breaking the cycle of disaster damage and reconstruction (FEMA, 2020b).

As part of the mitigation process, an organization should liaise with local emergency personnel to resolve or reduce as many risk factors as is possible (FAIC, 2022a). Programs such as the Massachusetts Board of Library Commissioners' Finding Common Ground (2022) encourage collaboration between emergency responders and cultural organizations prior to an incident.

Basic factors for inclusion in a risk-mitigation plan include the following:

1. List hazardous materials in the collection, labs, other workspaces, and the building structure, as well as hazardous materials slated or staged for disposal or removal from the site.

2. Note the location of scientific analytical equipment as well as how it is used.

3. Include a floor plan of the museum or structure that is to be provided to all emergency services supporting the organization.

4. In terms of a historic building, if there are preferable emergency entry points, these are to be highlighted to limit the damage to the materials that comprise the historic structure.

5. Internal priority list of high-value items. These will be made available to the organization's Response Team at the time of an emergency.

6. A list of individuals to contact in case of an emergency, to be shared with emergency personnel. The roster should include alternate ways to contact the organization's emergency personnel such as cell and landline telephone numbers, and email to communicate with key staff and alternates.
To ensure an effective, efficient emergency response, it is imperative that CH professionals connect with local first responders and disaster recovery vendors prior to an emergency event. Emergency response is safer and swifter when first responders know the layout of a cultural institution, the hazards that exist within the institution, and the importance of collection items.

3. Establishing an Emergency Plan

After the internal and external risks have been identified and mitigation has been addressed, an emergency plan should be developed, with steps for the organization’s emergency response and continuity, collections and site salvage, and institutional recovery (NPS, 2019).

Continuity of operations plans (COOP) ensure that the business aspects of an organization survive in the event of a disaster. CH organizations add continuity planning for specific operations such as electronic records, electronic finding aids, and digital catalog access, supported by information technology disaster recovery plans (Council of State Archivists, 2021). Continuity plans will include contingencies, such as prearranged evacuation sites in the event that all other planned options fail. These plans should operate concurrently with an organization’s emergency plan until normal operations are able to resume.

Plans should include the organization’s communication tree(s), to ensure the correct staff are called upon to participate in the response team. An effective way of ensuring that essential staff have easy access to critical contact information is to use the Pocket Response Plan published by the Council of State Archivists (2019). This is a credit card sized document with essential information needed by staff in case of a disaster or other emergencies.

Preplanning for Salvage, Staging, and Storage

Depending on the type of collections, an organization ideally has established working relationships with professional salvage companies that are skilled in working with cultural organizations. Having service agreements in place with salvage companies will ensure that the organization can quickly respond to an emergency. Staging areas and alternate storage areas should be identified prior to an emergency, with collections response kits ready to use at the site.

Examples of collections response kits can be found at the Florida Association of Museums (FAM) website (2022). FAM has published examples from various types of organizations. Materials found within the kits are tailored to the collections’ response and recovery needs. The kits also must contain personal protective equipment (PPE) in different sizes appropriate to the staff that will be using the kit (Occupational Safety and Health Administration [OSHA], 2022). Figure 4 illustrates the Smithsonian’s National Collections Program (2020) emergency kits.
4. Developing a Response Team

The structure of the response team ideally will be based on FEMA’s ICS structure (Figure 5), which is designed to be flexible. Most museums do not have embedded roles that mirror the ICS structure. As a result, many museums adapt the ICS structure to fit their needs. Response teams will vary in size and scope depending on the type of emergency and capabilities of the organization and staff. For instance, the director of a CH organization will not necessarily be the Incident Commander. The roles that these organizations may include are: a response team leader, documentation coordinator, and salvage coordinator.

Does the Incident Safety Officer Know There Is a Cultural Heritage OEHS Professional on Site Too?

The ICS structure identifies a formal safety officer position who typically reports directly to the Incident Commander, due to the importance of this function within ICS. This position may be filled by a safety or industrial hygiene professional, and this person may have others reporting to them (such as OEHS technical specialists), either directly or through the chain of command.

In a situation where the incident is managed internally, and if an ICS structure is implemented, OEHS professionals on staff or contract with the CH organization should fill the role of the safety officer.

In a situation where first responders are managing the scene, the fire or police department will assign the safety officer from their organization. Ideally, then, the CH organization OEHS professional will be assigned a role in the ICS structure as an assistant safety officer—assuming they have the appropriate ICS training to fulfill that role. If not, they could serve as technical specialists.

It is critically important, then, that the CH organization’s OEHS professional coordinate with the designated safety officer on the ICS team for that incident. For instance: Was the organization’s emergency plan shared with the incident safety officer? Were the lists and locations of hazardous materials, especially in collections storage, discussed with the incident safety officer?

The OEHS professional's training and experience can aid in this organizational effort, both before and during recovery. The OEHS professional has a valuable resource used extensively by CH organizations: David Carmichael’s book, Implementing the Incident Command System at the Institutional Level. It guides cultural organizations such as museums, libraries, and archives in applying ICS to their institutions (see Additional Resources).

Figure 4. Smithsonian Institution National Collections Program Collections Emergency Kits
Remember that many smaller and midsized CH organizations will not have an OEHS professional on staff, meaning that this job is often delegated to security personnel. Smaller institutions may need to liaise with outside OEHS resources (see Other Considerations section). Established in advance of an emergency event, the mutual aid arrangements between cultural institutions and OEHS professionals enhance the effectiveness of the response. This is especially true in a large national response, where most likely the incident safety officer will not be familiar with the spectrum of CH response and recovery activities required to safely secure these sites.

What Resources Are Available to CH Organizations to Assist Them in an Emergency?

Appendix B lists various federal, national, and state organization resources. However, CH organizations should always coordinate with their own state and local department of emergency management, which would be the lead in any state or local emergency incident. Coordination and preplanning with local first responders is critical: they must know what resources the CH organization has before an incident happens.

Only if the state has insufficient resources to respond to a disaster does FEMA take the lead. The state or local jurisdiction will have an emergency operations plan (EOP) (FEMA, 1996) that is compatible with the National Response Framework (NRF) (FEMA, 2021b). The framework’s Emergency Support Function (ESF) categories will indicate specific incident command responsibilities and aid in obtaining resources.

It is important for the OEHS professional to know that, although the category of historic/cultural property is usually listed under NRF’s ESF 11, Agriculture & Natural Resources Annex, a CH organization may be listed under other ESFs, depending on individual FEMA regions (FEMA, 2016) and customizations by the CH organization (e.g., the Smithsonian Cultural Heritage and Assets Support in ESF 4).

CH organizations should integrate their needs into their local EOP. An example of such action: Coordinated Statewide Emergency Preparedness (COSTEP) is an action plan for building alliances between cultural agencies and emergency management agencies. COSTEP helps integrate cultural resources into existing federal, state, tribal, and local emergency management structures and protocols (Northeast Document Conservation Center, 2022).
TRAINING

Personnel involved in CHEPR will require training. Establishing requirements for individual and organizational personnel training should be determined in the preplanning and planning stages and address how to support response, recovery, and mitigation actions.

Many safety and health training programs help organizations address emergency response. CHEPR should be integrated into an organization’s broader training program and exercises conducted under the core capabilities. According to FEMA, the Homeland Security Exercise and Evaluation Program (HSEEP)

“... provides fundamental principles for exercise programs, as well as a common approach to program management, design and development, conduct, evaluation, and improvement planning. ... The HSEEP doctrine is flexible, scalable, adaptable, and for use by stakeholders across the whole community” (FEMA, 2020a, pp. v–vi).
These programs include specific training that meets OSHA regulations as well as training programs specifically developed for CH organizations. There is no one-size-fits-all training curriculum.

Formal training should be available to all personnel, whether or not they are expected to support the CH organization in disaster events. In their personnel policies and training plans, CH organizations should include the use and nonuse of nonorganizational community volunteers. In developing risk-assessment analyses, OEHS and CH professionals should address scenarios and risks to nonorganizational volunteers and organizational liability.

Specific training should encompass:

- federal, state, local, and territorial statutes, regulations, and policies
- international requirements, if support will be provided outside the territorial United States
- organizational training requirements; these may be equal to or more stringent than federal, state, and local requirements
- training requirements as deemed appropriate by the on-site Incident Commander
- training requirements under the National Fire Protection Association (NFPA) for firefighters and emergency responders
- site-specific jobs and proximity of work to potential hazards
- the location of the cultural heritage site or sites

For example, a site located on a hazardous waste site or “operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard” (OSHA, 2022c) will require personnel to have received specific training. That regulation, often abbreviated as HAZWOPER, contains specific training requirements such as 8-hour, 24-hour, and 40-hour worker and supervisor training plus annual refresher training.

Note that not every worker or visitor admitted to a worksite requires HAZWOPER training in planning for supporting an emergency or disaster (including up to mitigation).

Both OEHS and CH professionals must coordinate with emergency planning and response partners to determine specific training requirements. Partners include external groups and stakeholders that make a direct contribution in an emergency response. Examples - federal and state authorities such as FEMA, OSHA, Environmental Protection Agency, Federal Bureau of Investigation and law enforcement, first responder fire and police, contractors, and the CH organization staff and leadership.

OEHS professionals generally are more knowledgeable than other professionals of HAZWOPER requirements. However, CH professionals (and organizational staff members) may have received training in emergency preparedness and response through various avenues as described below. (See Appendix B for a complete list with websites.)
Domestic and International Training Programs

The increase in disaster activity nationwide has reinforced the need for emergency training on collections-based emergency response for CH professionals, such as through FAIC and SCRI, among other organizations and federal entities. Training programs include these topics:

- ICS: the structure within which an emergency response operation should take place
- Type of CH collection material salvage and triage techniques: how to address damaged textiles, photographic materials, paintings, furniture, and other damaged collection materials.
- Health and safety: hazards to be aware of while responding to emergencies, and how to use PPE
- Environmental stabilization: how to identify and address environmental concerns within structures post-disaster
- Team-building: how to build an institutional emergency response team, secure leadership buy-in, and work with disaster recovery companies

Through training, CH professionals are given tools both to respond to emergencies and to request assistance when the needs of the impacted site outweigh the institution’s capacity. Both FAIC and SCRI training programs aim to strengthen CH professionals’ ability to respond to disastrous events. The key difference between the two training programs is their audience. FAIC focuses on building teams of responders, both at the regional and national level. SCRI provides Heritage Emergency and Response Training (HEART) to CH professionals associated with various organizations across the country (see Appendix B). The goal for these professionals is to bring what they learn at HEART to their institutions, thus enhancing their institutional capacity for responding to disasters.

Foundation for Advancement in Conservation (FAIC)

- Regionally, FAIC provides training to members of existing Alliance for Response (AFR) networks. By reinforcing previously established relationships, regional training programs improve disaster response capacity at the local level. During regional training, trainees hear from local emergency management professionals, disaster recovery company representatives, and institutional staff in their region, to learn how various entities approach cultural heritage emergencies. Trainees are taught how to work as a network to help each other in the event of a disaster.

- Nationally, FAIC provides training to CH professionals who are part of the National Heritage Responders volunteer corps. The NHR assists CH organizations on the national level. National training prepares NHR volunteers to be deployed to various disaster sites to help sites and facilities with initial response and assessment needs.

- FAIC maintains a consistent training curriculum, comprised of online modules and in-person components, for both regional and national training. All trainees, regionally and nationally, take FEMA’s course Introduction
to the Incident Command System (IS-100) and complete 16 online modules. The in-person training that follows focuses on scenario assessment. Presented with various mock disaster scenarios, trainees learn how to assess damage and advise impacted institutions on prioritization of response actions and steps.

**Smithsonian Cultural Rescue Initiative (SCRI)**

- SCRI's HEART graduates come both from CH institutions that wish to improve their collections management plans and from first responder groups that want a better understanding of the role cultural heritage plays in helping communities recover from a disaster. Ideally, HEART participants train in Washington, DC, for one week, then return to their respective institutions to educate their colleagues (see Appendix B).
- The HEART course consists of three parts: FEMA’s online course, Introduction to the Incident Command System (IS-100); a weeklong, in-person training at the Smithsonian Institution; and a webinar series that builds on concepts covered during the FEMA and in-person components.

**International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM)**

ICCROM (2022) leads the First Aid to Cultural Heritage in Times of Crisis (FAC) program, which links cultural heritage with disaster risk management and humanitarian assistance. The FAC program was initiated in 2009. Unlike the domestic programs mentioned above, it focuses on training international heritage caretakers within crisis-affected communities. ICCROM partnered with the Smithsonian and the Prince Claus Fund in 2015 to redevelop the course, and FAC is hosted periodically at various international locations.

Through this partnership, the FAC Manual and Toolkit—the essential written text for the course—was published in 2018 and is available for free download. ICCROM has recently completed another redevelopment of the FAC course, integrating more material about peacebuilding and climate action. The course is now titled First Aid and Resilience for Cultural Heritage in Times of Crisis (FAR). The FAR network has over 800 members, spanning over 87 countries.

**Training Collaboration**

OEHS professionals can add value to training by consulting the HAZWOPER regulation to develop anticipated training for emergency or disaster support.

OEHS and CH professionals:

- must identify training needs based on appropriate risk assessment
- need to work with local partners and organizational staff and leadership to develop a structured and prioritized training program including estimated budgetary needs and recordkeeping
- will benefit if aware of the training requirements and available curricula of each other's specialized field. Coordination and complementary aspects of these will allow our fields to work together to best protect everyone working to support cultural heritage emergency response
Cyclical Training

CH professionals may also receive periodic training on disaster readiness from their employers. Two such cyclical exercises follow:

- Observed on May 1, MayDay is a national emergency preparedness effort that was started by the Society for American Archivists [SFAA] in 2006 (SFAA, 2022) and is promoted by FAIC and other national service organizations. Cultural organizations, including libraries, museums, archives, and historical societies, are encouraged to take one action to increase their institutional preparedness, such as a preparedness plan. Encouraging CH institutions to tackle one emergency-related task before the start of hurricane season has been a productive way to jump-start institutional preparedness efforts each year.

- Tabletop exercises (TTXs) are discussion-based exercises intended to stimulate discussion on various issues regarding a hypothetical situation. Generally, TTXs allow participants to identify gaps in their emergency plans and preparedness measures. Recognizing weak spots in emergency plans in a non-disaster setting, such as during a TTX, is a productive way to enact positive change. See References for both a written TTX template (California Preservation Program, 2022; FEMA, 2020a); and a video TTX (Association of Archivists and Collections Specialists, 2021).

Cyclical training of volunteers is discussed later, in the section on Volunteers.

RESPONSE AND SALVAGE

Disaster sites may require use of map overlays and satellite data to identify locations of facility structures. OEHS professionals, in consultation with first responders, will ensure that a building or site is safe for reentry, although hazards may remain that must be addressed. These include debris, such as broken glass and nails, and also hazardous materials, such as lead and asbestos found in building materials. Risk assessment in war zones may include hazards such as unexploded ordnance or even persistent nerve or chemical warfare agents that have not been identified and neutralized or decontaminated prior to personnel entry or collection recovery.

The OEHS professional is uniquely qualified to point out these issues before anyone is placed in harm’s way. However, CH organization staff must be sure to keep all OEHS professionals who are interfacing with them on site informed about CH-related activities that must be conducted during the response phase of the emergency.

In addition to the types of conservation or collections recovery methods used, the activities will include observing the associated health and safety hazards and required controls employed both by staff and by contracted or hired commercial disaster recovery vendors. Thus, site safety practices and controls can be recorded and monitored.
Reviewing and monitoring in situ recovery activities and equipment for health and safety implications will include:

- reviewing the service provisions and OEHS plans of contracted/hired commercial disaster recovery vendors
- reviewing rental of emergency generators, pumps, light plants (e.g., possible hazards: noise levels, CO₂, electrical hazards)
- periodically auditing salvage and recovery activities for adherence to OEHS requirements
- recommending corrective actions per real-time situations
- assigning responsibility for issuing a stop work order for imminent hazards

OEHS professionals must confirm that CH staff are adequately prepared when they are allowed to reenter the building to begin salvage and recovery. They should work with the organization to review its emergency plan and establish priority lists for recovery activities. Bear in mind that there may be contingency off-site areas to which the collections will be evacuated and stored. All of these matters hinge on the size and scope of the emergency situation.

**Deploying Trained CHEPR Professionals to Disaster Sites After an Event**

Requests for CHEPR responders will come from an individual organization or, in the case of large-scale national and international disasters, government partners such as FEMA and SCRI. Depending on the scale of the disaster, common deployment challenges include ensuring safe transportation to and from the worksite and access to nutritious and hygienically prepared food. These challenges require careful monitoring by OEHS professionals to ensure the safety of first responders and CH professionals.

Preparing CH professionals to respond post-disaster depends on the organization. For example, FAIC deploys trained volunteers who sign a waiver pre-deployment, self-certifying their fitness level and readiness to deploy. All responders are expected to be medically fit to assist in a disaster response, including having

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**Deployment Challenges**

1. fatigue management
2. transportation
3. lodging (hotels; tents; facilities like schools, offices, gyms, and stadiums) quiet for sleeping
4. food
5. funding
6. PPE
7. scheduling
8. interagency management
9. mental health
10. being short staffed, having an adequate number of responders deploying
11. pandemic issues
12. personal sanitation (toilets, showers, sinks, running potable water)
13. political instability or disagreements
14. managing drive-by donations, with clear guidance about what donations may be accepted
a current respirator fit test with medical certification exam, and being up to date in critical inoculations or vaccinations such as tetanus.

In addition to their entry requirements, international response sites will have specific inoculation and vaccination protocols. CH organizations will determine individual requirements for infectious disease control measures such as mitigations for Covid-19.

OEHS professionals can assist organizational staff with respirator fit testing as part of the planning and preparedness process, and also proactively assist in the response and recovery process by monitoring working conditions and maintaining records on exposures, site safety and PPE usage.

CH professionals might deploy either as individuals or as a team, recognizing that each location and type of disaster has inherent challenges. Each responder will have a personal go bag for deploying quickly, with essential items to maintain them for the first couple of days, if needed. The go bag could include items such as PPE, medicines, change of clothing, sanitation and toiletry items such as wet wipes, a flashlight, batteries, nonperishable food, and water. A go bag list can be found at https://www.ready.gov/kit.

Documentation or other means of identification (e.g., hard-card, electronic database entry, labeled vests) should be carried by each person. However, that documentation and identification also should be maintained and made available by the subject organization for their supporting individuals and staff, showing applicable emergency support training, vaccinations, medical clearance, and fitness for duty.

Assessment of the Site

Prior to the end of the emergency response phase, information gathered by the response team should be shared with the recovery team, including OEHS professionals, to determine their next steps. Typically, observations by the response team provide a significant amount of intelligence and information, to make the transition from response to recovery much smoother.

As the recovery phase starts:

1. The recovery team should identify additional health, safety, and environmental concerns. Precautions to minimize identified risks should be established and communicated.

2. With the proper precautions in place, a survey can be conducted to evaluate the magnitude of impact on collections.

3. A safe work area from which to begin the salvage process should be identified and prepared. The area used for salvage needs to be large and well ventilated to accommodate drying collections and to inhibit mold growth. The institution’s emergency plan may identify “safe work areas” to be used for recovery activities.

It is important to remain flexible, as previously determined safe work areas may no longer be available or feasible for use post-emergency. Reassessments should be ongoing: conditions may change on an hourly or daily basis. Make sure personnel are trained to be alert to changes in conditions and to report them.
Salvage Priorities

The CH organization should prioritize collections based on importance or value. Rescue, relocation, and salvage of collections depends not only on the type of incident, prioritization, and fragility of the collections but also on the physical location of objects. There may be areas that remain difficult or even dangerous to access although they may contain vulnerable objects.

Each emergency event is unique. There is no one-size-fits-all salvage plan. CH professionals approach each event with the following considerations:

- Are the items rare and difficult to replace?
- Are items on loan from another institution?
- Are the items important to the institution’s mission or iconic recognition (e.g., history, namesake, or public identification)?
- What are the artistic or aesthetic values, the importance to research and science, or the importance to the historic, cultural, or social record?

CH professionals identify and sort collections according to their vulnerability to the specific nature of the emergency. Many emergencies affecting CH collections will have water as a damaging element, from water intrusion due to leaks, flooding, or sprinkler release during fires. In situations involving water, generally, organic collections (paper, leather, textiles, wood and ivory) will be most vulnerable, whereas collections with ceramics, glass, and stone will be less vulnerable. Many variables affect the complexity of relocating the artifacts from harm’s way and the recovery efforts immediately following.

OEHS professionals may access the documentation within the organization’s emergency plan for the known hazards of this collection and building. They will be able to set priorities accordingly.

Figure 6. USVI FEMA response 2018: Mold in the Legislative Archive.
Note: Photo by Katharine C. Wagner.
Documentation

Documentation, the written, photographic, and video record of an emergency, is vital to a successful response, both for insurance purposes and to help with lessons learned after the emergency ends. As soon as the building is safe, an assessment of the damage is important so that if the anticipated work or recovery area identified for salvage is inaccessible, another space can be secured.

Documentation forms should be included in the emergency plan. These forms include:

- damage assessment forms, for documenting the incident's impact on the facilities
- condition assessment forms, for documenting the impact on the collections
- inventory forms (blank), to list objects in specific areas within a facility

Additional supplies for documentation include: cameras, video-recording devices, laptop, blank paper, clipboards, and tags.

The level of detail required for documentation requires a documentation team. The ratio of documentation personnel to salvage personnel should be at least 2:1. Examples of documentation templates include AIC Emergency Committee Library (AIC, 2022b) and Rapid Collections Assessment (Foundation for Advancement in Conservation, 2017).

RECOVERY

Recovery is the implementation of a set of prioritized actions required to return an organization’s processes and support functions to operational stability following a change in normal operations.

During the process of response and salvage, gathered information drives the actions of the recovery team. The designated recovery team can work independently to consult the emergency plan, contact needed support, and use data from the response and salvage team members to understand the situation and consider different recovery scenarios and recovery methods. It is not a linear progression, and team members may certainly overlap, but options for recovery become clearer once the size, scope, and scale of the event is fully realized.

If multiple shifts are required to continue recovery efforts, appoint a team member to oversee briefing the incoming shift of responders, ensuring an effective hand-off between shifts. Use daily safety briefings to communicate among players and coordinate between needs as they arise.

### Recovery Steps

1. Consult plans and notify players.
2. Document (before, during, and after).
3. Consider scenarios based on available knowledge.
4. Assemble recovery teams.
5. Hand over and transition.

See Appendix C for details.
The speed and efficiency of recovery will depend on the scale of the disaster. The recovery team will assess whether actions can be taken quickly or if the situation will require more time. Because of the material makeup of CH collections, recovery time may be limited.

As mentioned earlier under Salvage Priorities, water will likely be one source of the damage, regardless of whether the source is a fire, tornado, hurricane, faulty plumbing, or a mishap during renovations.

If recovery occurs at the place of impact, the recovery team may be tasked with arranging for equipment (dehumidifiers, fans), because CH professionals require a stabilized, ambient environment to work in place. The recovery team may enact the contingency plan guidance for relocating collections to a safe and secure space. If there are no prior plans for relocation, it will be necessary to secure appropriate space for recovery actions.

**Recovery Scenarios and Recovery Methods**

Although the size and scope of the event dictates the recovery scenario, the composition of the artifacts drives the recovery method (Table 1). In the event that there is not enough staff or space, combined with the collection damage being so severe that the opportunity to begin recovery is not possible within a 72-hour time frame, freezing is an option to buy time for recovery and to prevent mold growth, as described earlier in the section Assessment of the Site.

**Table 1. Examples of Recovery Resource Scenarios and Resultant Recovery Methods**

<table>
<thead>
<tr>
<th>Recovery resource scenarios</th>
<th>Examples of recovery methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In-house with current staff</td>
<td>1. Air dry with fans and dehumidifiers</td>
</tr>
<tr>
<td>2. Bringing in external museum professionals, such as National Heritage Responders or the local Alliance for Response organizations</td>
<td>2. Air dry or pack for other methods</td>
</tr>
<tr>
<td>3. Hiring an outside vendor, possibly including OEHS professional</td>
<td>3. Industrial dehumidifiers; desiccant room to provide expertise and equipment to assist in recovery; air drying set-up, freeze drying</td>
</tr>
</tbody>
</table>

Freezing can be on site, in facilities with in-house freezers. Lacking those, or if vacuum freeze drying is required, commercial vendors can be contracted to bring a freezer truck to the CH site and pick up objects/specimens, stand by, or take the collections to their secure location—especially if there is no power at the recovery location. These contractors also provide wrapping and packing services upon request.

CH professionals understand the limitations of collections materials and can benefit from using the Emergency Response and Salvage Wheel (Figure 7). This two-sided tool is the single most recognized and respected tool for making triage and response and recovery decisions.
Figure 7. Emergency Response and Salvage Wheel
The Emergency Response and Salvage Wheel provides quick access to information on protecting and salvaging collections. The original slide wheel chart has been translated into nine languages and distributed in more than 40 countries.

Note: Photo by Jane Smith Stewart.

Regardless of available recovery scenario resources (current staff, trained volunteers, or contracted services), the OEHS professional is instrumental in a potentially chaotic time. In addition to their expertise in dealing with inherently hazardous collections, they will also be attentive and attuned to potential safety issues surrounding added vendor equipment: additional electrical requirements, the potential for excessive heat generated, and other issues of physical safety arising from additional bulky materials stored in an area.

The types of collections stored in individual CH facilities drive recovery efforts and dictate the response and recovery team needed. Because of the composition or manufacture of the artifact, hazardous collections are noted in the institution’s emergency plan, and they should be reviewed by the personnel responsible for OEHS at the time of the incident.

OTHER CONSIDERATIONS

Mental Health

During the response and recovery effort, CH and other responders deal with physical and emotional stress. Recovery is physically draining. Moreover, those engaged in recovery may face not only the personal impacts of a disaster but also their emotional response in witnessing those directly affected by the event. These stressors could be critically compounded by responders’ physical and mental fatigue during the recovery.
CH professionals need to be aware of not only their physical, emotional, and mental needs during stressful situations but also possible risks factor affecting co-workers and other responders. There are three considerations during times of stress: what to expect, the warning signs of stress, and the available resources to deal with these scenarios. See Appendix D for further information.

Common Warning Signs of Emotional Distress
- eating or sleeping too much or too little
- pulling away from people, pulling back from activities, isolating oneself
- having low or no energy
- having unexplained aches and pains, such as constant stomachaches or headaches
- feeling helpless or hopeless
- smoking excessively, drinking, or using drugs, including prescription medications
- worrying a lot of the time, feeling guilty but not sure why
- thinking of hurting or killing oneself or someone else
- having difficulty readjusting to home or work life (SAMHSA, 2022)

Volunteers

Volunteers are frequently engaged to assist during an emergency. They can be affiliated with the affected museums, be affiliated with other local museums, or be community volunteers. One way to ensure effective volunteers during an emergency situation is to train current volunteers to be part of the response and recovery process.

The length and content of the training must be commensurate with the complexity and possible risks involved with the volunteer assignment. For instance, a volunteer assigned to be the first-line guard to prevent interested bystanders from entering the recovery site requires different training from a volunteer involved in salvage operations.

Ideally, CH organizations periodically conduct disaster training with mock emergencies so that volunteers are confident in these roles when emergencies occur. In order to successfully activate existing museum volunteers during an emergency, there must be a framework to recall volunteers on site, reclarify their roles and responsibilities in this particular emergency response, and conduct on-site refresher (or new) training. If they are not well organized and trained, volunteers can pose a high risk (in the form of injuries and liability) to themselves, others, and collections in a recovery situation (AIHA, 2020).

Cultural Heritage Facilities and Sites as Safe Havens

Museum buildings have played important roles during recovery to help the wider community heal. They have been used as shelters and short-term emergency recovery centers in the past. They have also been used for emergency workers and community members to rest and recharge electronics or as a space where counselling or art therapy are offered.
For example, after Hurricane Dorian tore through the Bahamas in August 2019, the Art Gallery of the Bahamas became a collection site for donations of food and clothing that were distributed to shelters. It also served as a venue where those impacted by the hurricane could meet with mental health professionals (Selvin, 2019). In other instances, these organizations may have agreements with local authorities about providing shelter for members of the public or others during emergencies (including quick-developing, violent storms). OEHS professionals need to ensure they understand what activities may or may not be permitted to occur in that locality.

Continuity plans are required for all workplaces that are identified as critical infrastructure under Presidential Policy Directive 21 (2013) and for workplaces that support critical infrastructure. Libraries are considered essential services, according to the Stafford Act (FEMA, 2021a), which authorizes federal response activities. As a result, libraries are required to be up and running as soon as possible after a disaster and should include emergency and community mobilization support planning in their COOP.

This last point is significant, because the reopening of libraries may affect the areas available for recovery operations. In emergencies, libraries are used as community meeting points for first responders. They are also vital points for publicly shared computers. Therefore, reopening of libraries may have multiple implications: from a centralized meeting point that is fully powered and connected to the internet, to a trusted location to distribute information about the disaster situation.

### Armed Conflict

During times of armed conflict—when there is enough time to prepare—preemptive action can be taken to protect collections. Ideally, a safe location, removed from an active battleground, is available so that collections can be evacuated. Once vacated and emptied, buildings that housed collections can be secured and windows boarded to forestall serious damage to building infrastructure.

During the invasion of Ukraine in February 2022, the swiftness of the Russian advance and the targeting of CH sites took museum directors and curators by surprise. They leveraged social media and there was an outpouring of support from museums across Europe to gather funding and donated packing supplies to quickly evacuate collections (Farago, 2022).

### After-Action Reports

Each CH organization decides how to review and critique the event response, with recommendations for improvement. An overall event after-action report (AAR) analyzes the response to a disaster, ensuring that the lessons learned result in an improved response to the next emergency.

Specific data and information may be required by regulatory authorities, such as the HAZWOPER standard (OSHA, 2022c) or by organizational authorities, and are described in the HSEEP (FEMA, 2020a). Although this reporting process is vital, some CH organizations may be unaware of the need to include it as an element of their emergency plans. It is up to OEHS professionals to train organizational managers and staff on how to plan, by integrating lessons learned to effectively analyze an event.
Sections in the AAR should cover:

- incident overview
- analysis of the event
- data collection and statistical analyses and observations
- recommendations
- conclusions

These reports are fill-in-the-blank, narrative, or a combination of the two. The overall event AAR should be written from information collected from numerous sources, such as daily reporting sheets, debriefs, work crew/leadership shift changes, and incident reports. In this way, unique findings are not lost over the length of the emergency response.

Information from these reports may reveal patterns or trends that may not be readily apparent from casual observation, and it should serve as a summation of findings from multiple or repetitive happenings. All participants in the emergency response are asked for their observations. The aim of an AAR is not to apportion blame but to review and improve the emergency plan.

AARs provide the basis for corrective recommendations. An AAR should also include an implementation plan with measurable outcomes, responsibilities, and time frames. Review of previous AARs will be important in future event preplanning and training. AAR examples from CH organizations can be found at the online AIC Emergency Committee/REACH resource library (AIC, 2022a).

The respective roles of the CH and OEHS professional suggest that variations in the types of information tracked and needed in an AAR may differ. Both perspectives should be factored into in preplanning actions.

For example, a CH professional may be looking for issues affecting the safety of artifacts:

- number of disassociated artifacts
- type of packing materials and how they performed under emergency conditions
- tracking issues of artifacts through the response and salvage phase
- response kits (Were they accessible, fully stocked, and usable?)
- staff awareness and observance of disaster plan protocols

OEHS professionals, on the other hand, may be focusing on information to better protect people and the environment during future disastrous events:

- accident reports (to include near misses)
• exposure monitoring (worker or environment); type (general area, personnel/personal and number of samples; chemicals of interest; exposure level recorded—under or over the applicable exposure limit; appropriateness of PPE in use)

• communication issues (technology and command control structure)

• workers’ stress levels

• facilities’ general overall quality or comfort (food, hydration, heat, light, air conditioning, temperature)

• site safety violations (regulatory and organizational)

Where to Find OEHS Resources and Support

Finding OEHS support for addressing CH emergency response planning, training, and implementation begins with identifying a need. The need may be directly known (for example, a risk assessment for exposure needs to be performed), or the need may yet be defined (for example, what risks may factor into developing an emergency plan).

The obvious starting point is the organization’s office responsible for safety and health, occupational health or medicine, security, emergency planning, or environmental health or compliance. However, external resources may need to be identified.

Large organizations with multiple divisions, like the Smithsonian Institution and NPS, have a broad base of specialized safety and security employees on which to call. Likewise, state, county, or city governments should have a network of OEHS professionals to access. However, it is rare to have a designated OEHS professional on the staff of smaller private and local CH organizations, which may well lack access to a funding or budgeted resource and may not even know that they need this kind of assistance.

Although many organizations will understand that they should budget for the services of an OEHS professional, the CH organizations operate on a nonlevel playing field—some with only a volunteer workforce. In essence, the need for a CH organization to liaise with an OEHS professional is critical, at least to assess the potential hazards of a building.

Finding the appropriate resource outside the CH organization may require financial support to hire a consultant. Another avenue is to investigate the consultants’ listings of not-for-profit professional organizations such as AIHA, the American Society of Safety Professionals, and the National Environmental Health Association.

Government organizations such as OSHA offer an on-site consultation program (OSHA, 2022d). The National Institute for Occupational Safety and Health (NIOSH) offers health and safety hazard surveys, training programs, and other resources (NIOSH, 2019).
CH organizations might also request assistance and collaborators from local academic campuses, especially from their departments of museum studies, public health and industrial safety, and environmental engineering.

Lastly, consult AIHA’s website, which provides:

- government and academic resources. [https://www.aiha.org/ih-careers/career-advantage/ih-and-oehs-sites-resources](https://www.aiha.org/ih-careers/career-advantage/ih-and-oehs-sites-resources)
- professional consultants. [https://www.aiha.org/consultants-directory](https://www.aiha.org/consultants-directory)
- working groups and volunteer committees. Two are the Museum and Cultural Heritage Industry Working Group and the Incident Preparedness and Response Working Group
- [https://www.aiha.org/get-involved/volunteer-groups](https://www.aiha.org/get-involved/volunteer-groups)

**CONCLUSION**

To ensure a safe and successful outcome, disaster and emergency response planning and implementation requires coordination and communication between CHEPR and OEHS professionals. It is integral that all parties, including local and regional response organizations, are involved in each stage of the planning process, so that all parties bring their perspective and expertise.

For both CHEPR and OEHS professionals, training should be scheduled on a cyclic basis, so that the plan is regularly exercised, changes identified and made, and the essential steps reinforced.

In addition, effective internal communication is essential to the success of preparedness, mitigation, and response and recovery. Its goal is an effective flow of information between all responding team members, ICS, and outside organizations. Build an internal communications team parallel to your emergency team structure, to appoint primary contacts and individuals to communicate directly with ICS and contractors.

Emergencies will continue to put a strain on CH institutions in light of climate changes, aging buildings and infrastructure, social unrest, and reduced funds. Consequently, in the aftermath of an emergency, networking between CH organizations and their collaborators—local and state emergency response organizations, environmental departments tracking adverse climate impact scenarios, and public and OEHS practitioners—are critical to minimizing risks and impacts to people and property.
REFERENCES


ADDITIONAL RESOURCES


APPENDIX A: Acronyms

AAR – after-action report
AASLH – American Association for State and Local History
AFR – Alliance for Response
AIC – American Institute for Conservation
CH – cultural Heritage (CH) organization and cultural heritage (CH) professional
CHEPR – Cultural Heritage Emergency Preparedness and Response
COOP – continuity of operations plan
COSTEP – Coordinated Statewide Emergency Preparedness
EOP – emergency operations plan
ESF – emergency support function
FAC – First Aid to Cultural Heritage in Times of Crisis
FAIC – Foundation for Advancement in Conservation
FAM – Florida Association of Museums
FEMA – Federal Emergency Management Agency
HAZWOPER – Hazardous Waste Operations and Emergency Response
HEART – Heritage Emergency and Response Training
HENTF – Heritage Emergency National Task Force
HSEEP – Homeland Security Exercise and Evaluation Program
ICCROM – International Centre for the Study of the Preservation and Restoration of Cultural Property
ICS – Incident Command System
NFPA – National Fire Protection Association
NIMS – National Incident Management System
NHR – National Heritage Responders
Cultural Heritage Emergency Preparedness and Response:
Guidelines for the OEHS Professional

OEHS – Occupational and Environmental Health and Safety
OSHA – Occupational Safety and Health Administration
PPE – personal protective equipment
PRICE – Preparedness and Response in Collection Emergencies
REPP – Risk Evaluation and Planning Program
SCRI – Smithsonian Cultural Rescue Initiative
TTX – tabletop exercises
APPENDIX B: Cultural Heritage Emergency Response Organizations and Resources

Alliance for Response (AFR) is administered by the Foundation for Advancement in Conservation (FAIC). Launched in 2003, the AFR initiative encourages institutions to develop disaster plans and train for emergencies. It creates cooperative disaster assistance networks among museums, libraries, archives, and historical properties and sites; raises awareness of the importance of cultural heritage in communities; and influences official emergency policies and plans. AFR is found in 19 locations throughout the United States. [https://www.culturalheritage.org/resources/emergencies/alliance-for-response/networks](https://www.culturalheritage.org/resources/emergencies/alliance-for-response/networks)

American Institute for Conservation (AIC) Emergency Committee strives to promote awareness and increase knowledge of the AIC membership in the areas of emergency preparedness, response, and recovery for cultural heritage. It is composed of conservators and collections managers from across the country, with experience in various levels of collections disaster training and response, nationally and internationally. [https://www.conservation-wiki.com/wiki/Emergency_Preparedness_%26_Response](https://www.conservation-wiki.com/wiki/Emergency_Preparedness_%26_Response)

Conservation Center for Art and Historic Artifacts (CCAHA) provides a telephone hotline to advise institutions on issues affecting paper-based collections. It has a National Resource Guide for Disaster Preparedness. [https://ccaha.org/emergency-planning-response](https://ccaha.org/emergency-planning-response)

Federal Emergency Management Agency (FEMA) is the U.S. federal agency tasked with coordinating the response to emergencies that have overwhelmed the local jurisdiction’s ability to respond. FEMA is activated when a state governor issues a formal declaration of a statewide emergency and requests FEMA’s assistance from the president. The agency provides on-the-ground response and resources for recovery. Continuity of Operations: An Overview: [https://www.fema.gov/pdf/about/org/ncp/coop_brochure.pdf](https://www.fema.gov/pdf/about/org/ncp/coop_brochure.pdf) National Incident Management System: [https://training.fema.gov/nims/](https://training.fema.gov/nims/)

Heritage Emergency National Task Force (HENTF), cosponsored by FEMA and the Smithsonian Institution, is a partnership of 60+ national service organizations and federal agencies. Together its members constitute a nationwide resource of information, expertise, and assistance. [https://culturalrescue.si.edu/hentf/](https://culturalrescue.si.edu/hentf/)

National Heritage Responders (NHR) is administered by FAIC. This group of volunteers is comprised of conservators and collection professionals who have specific training in emergency response for cultural institutions. In the aftermath of Hurricane Katrina August 2005, FAIC identified the need for advanced training for cultural heritage emergency response and preparedness. FAIC developed that training for nationwide coverage. [https://www.culturalheritage.org/resources/emergencies/national-heritage-responders](https://www.culturalheritage.org/resources/emergencies/national-heritage-responders)

Northeast Document Conservation Center (NEDCC) provides a telephone hotline to advise institutions on issues affecting paper-based collections. [https://www.nedcc.org/free-resources/disaster-assistance/](https://www.nedcc.org/free-resources/disaster-assistance/)

Smithsonian Cultural Rescue Initiative (SCRI) was formed after the 2010 earthquake in Haiti. In that emergency, the Smithsonian partnered with international nongovernmental organizations to recover the cultural heritage of Haiti and to train local staff to be able to respond to the next emergency. SCRI has
responded to disasters in the United States but also Syria, Iraq, Egypt, Mali, and Nepal. Its mission is “to protect cultural heritage threatened or impacted by disasters and to help U.S. and international communities preserve their identities and history.” SCRI deploys its dedicated staff as well as conservators from other Smithsonian units for recovery missions as well as for training. The training is seen as an important follow-up to recovery assistance so that local communities can respond to the next disaster that strikes. [https://culturalrescue.si.edu/](https://culturalrescue.si.edu/)

**Smithsonian Institution’s Preparedness and Response in Collections Emergencies (PRICE) team** is integrated into its Incident Command System (ICS), offering essential training and other resources. [https://ncp.si.edu/preparedness-and-response-collections-emergencies-price](https://ncp.si.edu/preparedness-and-response-collections-emergencies-price)

**State museum organizations** also offer emergency response initiatives such as:


- Depending on the state, each type of cultural organization may have its own body for advice and assistance, such as Zoological Disaster Response Rescue and Recovery (ZDR3). It is based in Texas but has memorandums of understanding with multiple states. [https://www.zdr3.org/](https://www.zdr3.org/)
APPENDIX C: Recovery Steps

Consult Plans and Notify Players

As the emergency is unfolding, consult your institution’s emergency plan and notify key players including your financial unit, which can authorize emergency purchases and access to funds. Alert potential responders through the American Institute for Conservation, the Smithsonian Cultural Rescue Initiative, the Northeast Document Conservation Center, and the Conservation Center for Art and Historic Artifacts (see Appendix B). The various stakeholders will need time to organize if a response team is needed.

Document

While an emergency is being handled by emergency professionals, use any available time to document the situation, mentally and in writing, until the physical location is accessible. What happened? How quickly and in what way is (was) it addressed? Can first responders provide information about the extent and areas of damage?

Consider Scenarios

With information on the scope and extent of the damage from first responders, determine how recovery might be handled. Consider the relevant factors. Do you know how quickly or how long it will be before your team can enter? What kind of damage will you likely encounter upon reentry? Your situation, community impact, and the season will influence your response.

Assemble Recovery Teams

Even if the disaster is so extensive that you will require outside, professional responders, you will need to keep records of recovery efforts. You know your collections: gather maps and relevant information about the physical areas of the institution. Use the maps to note the location of hazardous materials. This information will guide your choice of professionals to consult.

Identify staff resources required. If outside contractors/vendors are needed, identify them, and begin the process of that business agreement. A combination of in-house and hired recovery efforts may be required.
**Transition or Handover**

Obtain a briefing from ICS as the response phase of the incident is wrapping up. At a minimum, collect the following information:

- precautions for reentry
- actions taken
- hazards remaining
- damaged areas from the incident
- what conditions to expect from emergency responders initial entry and response actions
- investigation team plans, including additional restrictions and/or restricted areas
APPENDIX D: Mental Health

What should you expect when dealing with your own emotional needs and those of other responders in a disaster situation?

Stress reactions to disaster situations are common. The experience of living with and seeing the impact on other people of a disaster is likely to affect a responder. The initial stress response for most people will be temporary, but the symptoms may be prolonged for some cohorts of the population, in particular children and teens. All cultural heritage staff, responders, and volunteers should be aware of the common warning signs of emotional distress.

Warning signs of stress in responders and recovery workers may include:

- experiencing a rapid heart rate, palpitations, muscle tensions, headaches, and tremors
- feeling fear or terror in life-threatening situations or perceived danger, as well as anger and frustration
- being disoriented or confused, having difficulty solving problems and making decisions
- engaging in problematic or risky behaviors, such as taking unnecessary risks, failing to use personal protective equipment, or refusing to follow orders or leave the scene
- becoming irritable or hostile in social situations, resorting to blaming, and failing to support teammates

First responders and recovery workers most at risk for emotional distress include those who have experienced:

- prolonged separation from loved ones
- life-threatening situations
- previous deployments that caused disruptions in home or work life
- trauma from having witnessed or been exposed in some way to difficult stories of survival or loss (SAMHSA, 2022)

SAMHSA’s description of a first responder or recovery worker encompasses:

- firefighters
- police officers
- emergency medical technicians
- 911 operators and other fire, emergency, and medical personnel
- military service men and women
- clergy, staff, and volunteers serving with disaster-relief organizations, including sheltering, animal rescue, foodservice, and crisis counseling
What can you do to alleviate effects of stress?

- Cultivate resilience prior to and during a disaster.
- Prepare for an emergency by taking measures at home: prepare a go bag for yourself and family members, and develop a communication and disaster plan with family members (American Red Cross, 2022).
- Cultural heritage professionals must take care of their own needs and those of their families first.
- Maintain normal habits: get adequate sleep and exercise; eat well-balanced meals; hydrate with noncaffeinated, nonalcoholic beverages; take rest breaks when possible; and talk about feelings as needed (OSHA 2022b).
- Communicate with family members and stay connected to support networks.
- Create a routine: perform at least one routine activity daily, such as calling home at a certain time or scheduling rest and relaxation (USDHHS, 2022).
- On site, manage staff expectations and provide as comfortable a work environment as is possible.

Each individual should have a clearly defined role:

- Conduct regular briefings at shift changes to include safety procedures and operation updates.
- Use the buddy system: partner inexperienced staff with a more experienced person. That way, stress levels can be monitored more effectively.
- Ensure regular work breaks. Break areas should be separate from work areas.
- Monitor noise levels and provide PPE as needed.
- Mitigate the effects of extreme temperatures through proper hydration, frequent breaks, and correct PPE.
- Ensure sufficient lighting (USDHHS, 2005).

Where Can You Get Help?

In addition to local healthcare providers and online counseling providers, there are other providers of mental health services in a disaster, such as the Substance Abuse and Mental Health Services (SAMHSA) Disaster Distress Helpline: 1-800-985-5990, which offers toll free counseling and support.

As of July 2022, the National Suicide Prevention Lifeline is the 988 Suicide and Crisis Lifeline. 988 has been designated as the new three-digit dialing code that routes callers to the National Suicide Prevention Lifeline.

In a disaster, crisis response teams at the state and local level also are dedicated to responding to the mental health needs of the community.
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