

PREVENTATIVE CONSERVATION AND DISASTER MANAGEMENT PLANNING
IN CULTURAL INSTITUTIONS

by

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ABSTRACT OF THE THESIS

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This thesis discusses disaster risk management planning in museum and cultural institutions in the larger cultural heritage sector. Disaster risk management for cultural heritage is a field that grew out of preventative conservation philosophies. By looking at the history of the field of disaster risk management planning for cultural heritage and its roots in preventative conservation, key elements for developing institutional disaster risk management plans are explored. The intertwined fields share common goals and principles for safeguarding cultural treasures. Using the principles for safeguarding collection material, the thesis explores recent guidelines found on the international, national, and institutional level. Through the comparison of the international and national guidelines on disaster risk management strategy in the cultural heritage sector, along with institutional guidelines, one can formulate essential strategic elements for the development and implementation of disaster risk management plans for cultural heritage institutions. Three key areas of communication, awareness, and plan development are discussed in the conclusion of the thesis.

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Introduction

Museums serve as depositories of works of art and movable cultural heritage. The collections consist of those elements that are on display for public view and those that are out of sight in storage. No matter where the objects are housed in the museum, there are certain parameters that museum professionals can take to care for the collection. This care consists of ensuring the safety of the materials from everyday wear, as well as protecting collections against a rare or unexpected event, all of which falls under the umbrella of preventative conservation.

The American Institute for Conservation (AIC) defines preventative conservation as “the mitigation of deterioration and damage to cultural property through the formulation and implementation of policies and procedures.”¹ Museum collections can face threats from a variety of sources – both internal and external. The most common threats are known as “The Ten Agents of Deterioration”, a concept defined by Stefan Michalski and Robert Waller, and include: vandalism, fire, pollutants, light, and temperature, among others.² These factors are not all of the threats that collections face, but can be used by an institution as a framework for preventative conservation measures. Although some of the agents of deterioration are not completely preventable, many can be hindered through preventative conservation practices, greatly

¹ “Definitions of Conservation Terminology,” AIC: American Institute for the Conservation of Historic and Artistic Works, accessed 2013, <http://www.conservation-us.org/about-conservation/definitions#.VAN8ZUjRE7A>.

² “Ten Agents of Deterioration,” Canadian Conservation Institute, accessed November 2013, <http://www.cci-icc.gc.ca/caringfor-prendresoindes/articles/10agents/index-eng.aspx>.

extending the life of the collection. The measures cover a variety of institutional practices that focus on safeguarding the collections, such as limiting the exhibition's exposure to light, monitoring the collection's environment, and establishing proper storage spaces. These ten agents can also be used to establish a risk and disaster management plan, which is a key element in preventative conservation practice in the collections care environment. This risk and disaster management plan will identify potential threats to collections and establish a procedure to respond to such threats if an event occurs.

In recent years, the phrase "disaster management planning" has gained more prominence as the need of proper disaster management plans in museum and heritage sites has become increasingly apparent as the world experiences violent weather patterns and the effects of other natural and cultural disasters.³ The 2010 earthquake in Haiti, the 2011 tsunami/nuclear disaster in Japan, and the recent events of the "Arab Spring" which have given rise to ongoing violence and vandalism in Egypt and other countries in the region since the end of 2010, are just some of the events affecting cultural heritage that have gained international attention in the last decade. One never knows when an emergency situation may take place, and advance planning can save precious minutes when the situation does strike. Learning more about disaster and risk planning is an important skill to develop when working with the care and preservation of art and artifacts.

³ Nimal de Silva, "Preparing and Response for Cultural Heritage Disasters in Developing Countries," in Cultural Heritage Disaster Preparedness and Response, International Symposium Proceedings, Salar Jung Museum, Hyderabad, India, 23-27 November 2003, (Paris: ICOM, 2003), 225.

This thesis discusses the aspects of preventative conservation and disaster management planning that can be best utilized to safeguard museum collections in day-to-day operations and in times of emergencies. This will be done by looking at the intertwined nature of the fields of disaster risk management and preventative conservation in the cultural heritage sector. By first exploring how the disaster risk management grew out of preventative conservation practices through the discussion of past philosophies and major disaster events of the past century, the basic principles and goals of disaster risk management in cultural institutions can be established. Using these principles, the thesis will then explore basic guidelines on the international, national, and cultural institutional levels that are followed by cultural institutions and museums. Comparing these guidelines while keeping in mind the goals of disaster risk management and preventative conservation measures will highlight common recommendations for “best practices.” Disaster management planning and preventative conservation are key aspects to collection care and by looking into the common guidelines one can formulate essential strategic elements for the development and implementation of disaster risk management plans for cultural heritage institutions.

As with any discussion, the terminology of the field can be unique. There may also be multiple interpretations for a single term. For this reason, this thesis will first establish the definitions of a several key terms.

Key terms

A. Museology terms

Throughout this thesis, the terms “museum” and “cultural institution” will be used interchangeably to describe museums, archives, libraries, and other centers of cultural material. Though the definition of a museum has evolved over time, the International Council of Museums (ICOM) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) currently define museums as:

a non-profit making, permanent institution in the service of society and its development, and open to the public, which acquire, conserve, research, communicate and exhibit, for purposes of study, education and enjoyment, material evidence of people and their environment.⁴

Or, as UNESCO succinctly states, museums are “cent[ers] for conservation, study and reflection on heritage and culture.”⁵ Museums and other cultural institutions act as guardians to the world’s heritage, and hold a vast collection of material culture. Within the bowels of these structures sits a wealth of artifacts, which can tell anything about the history of a people to the story of technological progress. These cultural institutions can serve to educate one about natural history, other cultures, or act as archives of historical documents. They can showcase world-class fine arts

⁴ “Development of the Museum Definition according to ICOM Statutes (2007-1946),” ICOM, last modified January 2009, http://archives.icom.museum/hist_def_eng.htmlhttp://archives.icom.museum/hist_def_eng.html.

“Museums,” UNESCO, accessed December 2013, http://portal.unesco.org/culture/en/ev.php-URL_ID=35032&URL_DO=DO_TOPIC&URL_SECTION=201.html.

⁵ “Museums,” UNESCO.

or introduce children to the science around them. Each museum has a purpose, which is reflected through its exhibitions of these specialized collections.

The objects and works found in a museum are referred to as a museum's "collection," and those that are on display for the education of the visitors are but one part of the institution's total collection. Museum collections are often split into different categories, such as permanent or temporary. The temporary collection consists of objects that are on loan to the institution – both long term and short term. During the length of the loan, the museum is responsible for the care and upkeep of the artifacts. The extent of the care varies with each loan, as the institutions involved create lending agreements pertaining to the object's treatment and display.⁶

The other type of collection is the museum's permanent collection. These are objects that the museum has acquired through donation, purchase or fieldwork and now owns.⁷ The permanent collection can further be divided into display, storage, and research collections.⁸ The display collection is often the most "valuable" or significant, as the objects on display are the ones that the visitor will see. These objects on exhibition serve as ambassadors for the museum's functions and will often draw in visitors. The collection in storage is often the most extensive. These objects can be rotated with pieces on display, but while in storage they are often kept in permanent housing locations. The research collection consists of the objects

⁶ Tim Ambrose and Crispin Paine, *Museum Basics*, (New York: Routledge, 2006), 144.

⁷ Ambrose and Paine, *Museum Basics*, 135.

⁸ Hanna Szczepanowska, *Conservation of Cultural Heritage: Key Principles and Approaches*, (New York: Routledge, 2013), 5.

that scholars or classes may use. These objects are often handled more than those on display or in storage collections, creating more wear than other objects in the museum may experience.⁹ All of the material found in a museum collection is relevant to the institution's function and for the information they convey. The objects found within the museums are links to the past as well as the traditions and cultures from which they originated. The continued existence of the heritage objects is maintained in part through the conservation measures taken by the institutions, which has helped to shape modern conservation and preventative conservation practices.

B. Disaster Risk Management terms

When exploring the subject of disaster risk management, one of the first issues to confront is the definition of a disaster. According to the 2009 *Global Assessment Report on Disaster Risk Reduction* by the United Nations International Strategy for Disaster Risk Reduction (UNISDR), the number of disasters around the world has been increasing.¹⁰ In recent years, this has been seen in the strength and destruction of storms and physical phenomena, which have affected the east coast of the United States. In 2005, Hurricane Katrina devastated the gulf region of the country as the world watched on television. In 2011, a rare earthquake was recorded all along the eastern seaboard after seismic activity was registered in Virginia. And on October 29, 2013, Hurricane Sandy swept through the northeastern United States, causing

⁹ *ibid*

¹⁰ UNISDR, *International Strategy for Disaster Risk Reduction. Global Assessment Report on Disaster Risk Reduction: Risk and Poverty in a Changing Climate*, (Manama, Kingdom of Bahrain: Oriental Press, 2009), 19.

structural, physical, and monetary losses. The damage caused by these events ranged from flooded museums in New Orleans¹¹ to structural instability in the National Cathedral in Washington, DC.¹²

The cases mentioned above are well known natural phenomena. It is this type of widespread destruction that is brought to mind when one hears the term “disaster”. But what exactly is a disaster? Though a seemingly simple term, it can take on various meanings to different groups or situations. Disaster often brings to mind a rare or catastrophic event. But in fact, disasters can occur every day and take place over a long period of time. In the United States, the Federal Emergency Management Agency (FEMA) defines disaster as “an occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, death, and/or multiple injuries.”¹³ This definition is focused on the economic and human losses of a community. Though these are significant factors in the severity of a “disaster” event, there are other factors that can be considered when classifying an occurrence as a disaster. A disaster can affect the fabric of community, changing the way of life, such as is currently being seen in Africa where the effects of climate change are slowly changing the physical landscape and in doing so is wiping out both the agrarian and pastoral traditions of those in sub-Saharan Africa.¹⁴ This is a disaster that has a direct

¹¹ Kristin Kelly and Joan Weinstein, “Rethinking Crescent City Culture: New Orleans Two and a Half Years Later,” *The Getty Conservation Institute Newsletter* 23:1 (2008): 16.

¹² “Preservation and Restoration,” National Cathedral Association Publication, last modified August 2014, http://www.nationalcathedral.org/bulletin/NCA_Preservation.shtml/#.VAKemSjEcUU.

¹³ “Glossary of Terms,” FEMA: Federal Emergency Management Agency, <http://www.fema.gov/pdf/plan/glo.pdf>.

¹⁴ Padma Narsey Lal and Tom Mitchell, “National Systems for Managing the Risks from Climate Extremes and Disasters,” in *Managing the Risk of Extreme Events and Disasters to Advance Climate*

impact on the intangible cultural heritage of a region. Disasters can be both cultural, or intangible, or physical, or tangible, when referring to cultural heritage. It is for this reason that this paper will refer to the UNISDR terminology of a disaster that in part defines the event as “a serious disruption of the functioning of a community or a society...”¹⁵ This is a more general interpretation of a disaster in which the museum can be viewed as a community, and the disaster threatens the operation of the institution as well as the materials within it.

The UNISDR definition of disasters states that disasters can be born out of emergency situations, in which an emergency is seen as “a threatening condition that requires urgent action.”¹⁶ Similarly, the International Council of Museums (ICOM) states, “a disaster is an emergency situation that is out of control.”¹⁷ In this definition, a disaster can be viewed as a major event such as an earthquake or an emergency such as a smaller, more institutional-contained event when there is a systems failure that can cause temperature fluctuations or flooding. Though emergencies are often seen as less extreme in comparison to disasters, both have the potential to harm museum collections. For this reason, the terms “disaster” and “emergency” will both be used in this thesis in reference to threats to cultural heritage.

Change Adaptation, edited by Christopher B. Field et al. (New York: Cambridge University Press, 2012), 368.

¹⁵ “Terminology: D”, UNISDR, accessed June 2014, <http://www.unisdr.org/we/inform/terminology#letter-d>.

¹⁶ “Terminology: E”, UNISDR, accessed June 2014, <http://www.unisdr.org/we/inform/terminology#letter-e>.

¹⁷ ICOM and ICMS, *Guidelines for Disaster Preparedness in Museums* (1993), 3.

Other disaster risk management terms are “risk,” “hazard,” and “vulnerability.” Risk is a term used frequently in this thesis. UNISDR defines risk as “the combination of the probability of an event and its negative consequences.”¹⁸ Risk is also described as “a combination of a hazard and a vulnerability.”¹⁹ Through these definitions, risk can be seen as a threat to collection material that has the ability to create an emergency, and therefore a disaster.

The National Park Service (NPS) defines the term “hazards” as a combination of natural factors, location risk factors, and social factors. This term includes natural phenomena such as storms, floods, and fire, as well as acts of terrorism or vandalism.²⁰ The NPS definition is in keeping with the UNISDR definition, which defines a hazard as “a dangerous phenomenon, substance, human activity, or condition that may cause...property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.”²¹ In this thesis, hazards are used to refer to threats to a museum collection that have the potential to escalate a situation into a disaster.

Vulnerability is another term associated with risk and hazard. Vulnerability refers only to “the likelihood that the collection will sustain damage,”²² or its susceptibility. The NPS identifies the main factors affecting a collection’s

¹⁸ “Terminology: R”, UNISDR, accessed June 2014, <http://www.unisdr.org/we/inform/terminology#letter-r>.

¹⁹ UNESCO, *Managing Disaster Risk for World Heritage*, (UNESCO: 2010), 8.

²⁰ Diane Vogt O’Connor, “Chapter 10: Emergency Planning,” in *Museum Handbook, Part 1: Museum Collections*, (Washington, DC: National Park Service, 2000) 10:3. Accessed <http://www.nps.gov/museum/publications/MHI/MHI.pdf>.

²¹ “Terminology: H”, UNISDR, accessed June 2014, <http://www.unisdr.org/we/inform/terminology#letter-h>.

²² O’Connor, “Emergency Planning,” 10:3.

vulnerability as the material composition of the artifacts, collection housing, and the level of training given to the staff.²³

In an additional note, the field of disaster risk currently uses the terms ‘Disaster Risk Reduction’ (DRR) and ‘Disaster Risk Management’ (DRM). Disaster risk reduction is widely viewed as measures taken before a disaster strikes, such as mitigation and preparedness. Disaster risk management is often used in reference to the steps taken after a disaster, mainly the response, recovery, and salvage operations. For simplicity’s sake in this thesis, the term disaster risk management (DRM) will be used in reference to the disaster risk management planning process as a whole, including stages both before and after an emergency event.

²³ *ibid*

Chapter 1: A Brief History of Preventative Conservation

Safeguarding cultural material through a formal disaster risk management plan is a recent development in the cultural heritage sector, but the idea of preserving cultural heritage is not a modern phenomenon. An exploration of the past philosophies of preserving cultural material helps to establish a better understanding of the contemporary practices of preservation and disaster risk management for cultural heritage. Throughout time there have been people who have wished to “pursu[e] the preservation of values that are attached to the features of heritage.”²⁴ In his publication *A History of Architectural Conservation*, Jukka Jokilehto cites examples dating back to ancient Egypt and Rome, where conscience decisions were made to preserve or conserve monumental structures.²⁵ Also cited by many historians as some of the earliest evidence of preservation-minded planning are the writings of ancient Roman architect Marcus Vitruvius Pollio.²⁶ In Vitruvius’s *De Architecture* (also known as *The Ten Books on Architecture*), written in the first century BCE, the ancient planner writes recommendations for libraries and painting galleries suggesting that they be situated outside of direct sunlight. He also discusses the effects of extreme heat and other environmental deteriorants on

²⁴ Heidi Wirilander, “Preventative Conservation: A Key Method to Ensure Cultural Heritage Authenticity and Integrity in the Preservation Process,” *e-conservation* 1 (2013): 167.

²⁵ Jukka Jokilehto, “A History of Architectural Conservation: The Contribution of English, French, German, and Italian Thought towards an International Approach to the Conservation of Cultural Property” (PhD diss, University of York, England, 1986) 24.

²⁶ Wirilander, “Preventative Conservation,” 168.

city planning.²⁷ Even in ancient times there was a concern for the effects environmental conditions could have on materials. These thoughts continued to persist and evolve over time, slowly developing into guidelines used today for heritage preservation projects.

In the centuries following the writings of Vitruvius, theories on preservation continued to evolve. Conservation professional Simon Lambert states that some of the earliest intentionally documented preservation projects are from the seventeenth century, including one for the conservation of Raphael's frescoes in Rome.²⁸ Lambert further states that one of the first documents specifically addressing issues of preventative conservation for collections is to be found in *Museographia*, a museum guide written in 1727 by Caspar F. Neickel.²⁹ Neickel gives specific instruction on collection care including the monitoring of pests, moisture, and museum visitors. He also gives guidelines for mitigating damage to the collection through exhibition design and proper handling.³⁰

The Neickel publication is significant since the concept of a public collection of art or a museum was not heard of in Europe until the late seventeenth century. Before this time, collections were typically found in private homes, such as the popular *Kunstkammern*, or "Cabinets of Curiosities," of the sixteenth century. This

²⁷ M. Vitruvius Pollio, "The Ten Books on Architecture," in *The Architecture of M. Vitruvius Pollio: Translated from the Original Latin by W. Newton, Architect*, trans. W. Newton, *Historical Perspectives on Preventative Conservation*, ed. Sarah Staniforth, (Los Angeles: Getty Conservation Institute, 2013), 34-36.

²⁸ Simon Lambert, "Italy and History of Preventive Conservation," CeROArt (2010): online edition, accessed <http://ceroart.revues.org/1707>.

²⁹ Caspar F. Neickel, *Museographia oder Anleitung zum rechten Begriff und nützlicher Anlegung der Museorum oder Raitäten-Kammern*, (Germany, 1727), cited in Simon Lambert, "Italy and History of Preventive Conservation," CeROArt (2010): online edition, accessed <http://ceroart.revues.org/1707>.

³⁰ *ibid.*

Wirilander, "Preventative Conservation," 168.

changed with a donation of a private collection to Oxford University by Elias Ashmole,³¹ which precipitated the founding of the Ashmolean Museum in 1683.³² The establishment of the Ashmolean Museum, and other institutions like it, began a new method of collecting – ushering in the modern western museum concept.

Once the western museum culture was born, a new need to care for large and diverse collections soon developed. The material of the collections, whether modern or ancient, has a finite life. It is a fact of nature that both organic and inorganic materials cannot last forever, as they will eventually begin to deteriorate. The handling that objects may experience can contribute to this deterioration. This is especially true for organic materials, such as leathers or lacquers, which are extremely susceptible to environmental changes, especially light, humidity, and pollution.³³ The loss of this material could be extremely detrimental to the knowledge that one gains through this medium. To mitigate the potential loss to the artifacts, museum staff have turned to conservation practices.

Early writings on preservation for museum objects were often placed within other booklets, such as housekeeping or museum guides.³⁴ The above-mentioned comprehensive museum guide of Neickel's *Museographia* was one of the few publications of its kind when first published, but other publications on similar topics soon began to be developed. Between 1761-1781, Bernard Simon of the Murdach

³¹ Part of the collection Ashmole donated included artifacts he collected and acquired by two John Tradescants (father and son).

³² Sarah Staniforth, ed., *Historical Perspectives on Preventative Conservation*, (Los Angeles: Getty Conservation Institute, 2013), 89.

³³ NPS, "Preventative Conservation Recommendations for Organic Objects," *Conserve O Gram*, 1:3 (July 1993): 1.

³⁴ Staniforth, *Historical Perspectives*, vx.

Abbey in Alsace, France, wrote what was later known as *The Seven Golden Rules for Archivists*, which includes the instruction: “In the spring, in warm weather, open the windows and doors of the Archives, to create a flow of air and drive out the cold and humidity; close each night so that the damp air does not harm the documents.”³⁵ It also mentions rules for handling, cleaning, and viewing³⁶, all of which demonstrate a continued awareness of the need for proper care in the long-term care of collection materials.

The documentation for care of archival and museum materials further developed over time, with a significant increase in the publication of preservation guidelines and theories in the nineteenth century. One significant document from this time in relation to preventive conservation is William Blades’s *The Enemies of Books*, published in 1880.³⁷ Blades’s work identifies fire, water, gas/heat, dust/neglect, ignorance, the bookworm, vermin, bookbinders, and collectors as the most significant factors in the deterioration of archival materials.³⁸ Each of these “enemies” has an impact on the preservation of the book, whether it is the slow penetration of moisture in the fabric of the book creating mold growth or the collector tearing apart a volume for the more “valuable” components. These agents also include the effects of large-scale disasters. In the chapter on fire, Blade states the results of the Great Fire of London in 1666 in which:

³⁵ Bernard Simon, “The Seven Golden Rules for Archivists”, in *La Gazette des Archives*, No 162, edited And translated by J. L. Eichenlaub, *Historical Perspectives on Preventative Conservation*, ed. Sarah Staniforth, (Los Angeles: Getty Conservation Institute, 2013), 64.

³⁶ Simon, “The Seven Golden Rules,” 63-64.

³⁷ William Blades, *Enemies of the Book*, (London: East and Blades Printers, 1880), v.

³⁸ Blades, *Enemies of the Book*, vii-x.

the number of books burnt was enormous. Not only in private houses and Corporate and Church Libraries were priceless collections reduced to cinders, but an immense stock of books removed from Paternoster Row by the Stationers for safety was burnt to ashes in the vaults of St. Paul's Cathedral.³⁹

This work identifies nine “enemies” for books and archival materials, foreshadowing the lists of agents of deterioration identified by modern conservators in the twentieth century and similar to the list of agents identified by the Canadian Conservation Institute.⁴⁰

The identification of the causes for deterioration is a starting step in developing measures to mitigate the damage done to museum collections. Though Blade writes primarily about the causes of the destruction in archival material, he also made suggestions on preventive steps. In the chapter concerning water, Blade writes that “the best way of keeping libraries entirely free from damp is to circulate our enemy...”⁴¹, again demonstrating an increased awareness of preservation problems and a continued development of theories and practices on how to safeguard documents, works of art, and other cultural heritage objects from various agents of deterioration.

Though throughout history there is written evidence of man's compulsion towards preserving their history, it is the nineteenth century that many credit with the birth of modern conservation practices and theories, including that of

³⁹ Blades, *Enemies of Books*, 10.

⁴⁰ “Ten Agents of Deterioration,” Canadian Conservation Institute.

⁴¹ Blades, *Enemies of Books*, 24.

preventative conservation practices,⁴² with further development of the field seen throughout the twentieth century. One of the key philosophies developed during this period was that of John Ruskin in his book *The Seven Lamps of Architecture*. In the chapter entitled, “The Lamp of Memory”, Ruskin makes a distinction between the terms of “preservation” and that of “restoration”.⁴³ In this philosophy, preservation is seen as the care given to heritage, in this case buildings or architecture. Ruskin believes that this was the more desirable concept, as he argues that restoration can cause harm, calling it “the most total destruction which a building can suffer.”⁴⁴ Restoration, the process of trying to recreate the original after it has been lost, is seen as destroying the authenticity and integrity of cultural heritage. This is a notion that has carried through to the present day, as modern conservators tend to use the preservation standards, with minimal intervention and the creed “to do no harm”.⁴⁵ Conservators also strive to make any aspects of their treatments that could be considered restorations completely distinguishable and removable from the original material.

Another notable 20th century preservation theorist is that of Cesare Brandi. In 1963, Brandi, the first director of the Istituto Centrale del Restauro in Rome,

⁴² Wirilander, “Preventative Conservation,” 168.

⁴³ John Ruskin, “The Lamp of Memory”, in *The Seven Lamps of Architecture, Historical Perspectives on Preventative Conservation*, ed. Sarah Staniforth, (Los Angeles: Getty Conservation Institute, 2013), 2.

⁴⁴ *ibid*

⁴⁵ “Code of Ethics,” AIC: American Institute for the Conservation of Historic and Artistic Works, accessed 2013, <http://www.conservation-us.org/about-us/core-documents/code-of-ethics#.VAKTMSjEcUU>.

published *Teoria del restauro* (translated to *Theory of Restoration*).⁴⁶ Brandi established a distinction between the practices of “conservation” and “restoration.” Brandi believed that alterations made to works of art were harmful to their authenticity and integrity.⁴⁷ These concepts of authenticity and integrity remain important to the field of conservation to this day, especially with the concept of “universal value” in terms of the World Heritage Convention, which will be discussed in a later chapter.⁴⁸

Brandi also dedicated a chapter in the book to preventative conservation. He thought that preventative care could mitigate the harm done to such objects. Brandi defined preventative restoration⁴⁹ “as care, removal of dangers and assuring favourable conditions.”⁵⁰ He also calls it a scientific process that involves examination and conditioning of the object in question.⁵¹ Though Brandi’s work was not widely translated at the time of publication, his theories have made a lasting impact in his field.

Today’s standards in preventative conservation were established from these early conservation philosophies. They have also influenced the development of

⁴⁶ Cesare Brandi, “Preventive Restoration”, in *Theory of Restoration*, translated by Cynthia Rockwell and edited by Guiseppa Basile, *Historical Perspectives on Preventative Conservation*, ed. Sarah Staniforth, (Los Angeles: Getty Conservation Institute, 2013), 9.

⁴⁷ *ibid.*

⁴⁸ Sophia Labadi, *UNESCO, Cultural Heritage, and Outstanding Universal Value: Value-based Analyses of the World Heritage and Intangible Cultural Heritage Conventions*, (Plymouth, UK: AltaMira Press, 2013), 113.

⁴⁹ In this translation restoration is used for the Italian “restauro”. The English use of the terms restoration and conservation, tend to define restoration as the act of bring back to original state and conservation as examination, intervention, and sustaining the general form. In this case, the term conservation would be the more accurate definition.

⁵⁰ Brandi, “Preventative Restoration,” 10.

⁵¹ *ibid.*

disaster management planning in museums. Philosophies on preserving cultural material were tested through multiple wars and natural disasters witnessed in the twentieth century. These events threatened centuries of collected cultural material, resulting in further development of preservation practices and disaster risk management planning for cultural institutions, a topic which will be discussed in the next chapter.

Chapter 2: The Development of Disaster Risk Management in the Twentieth Century

The planning that a cultural institution puts forth into preventative measures in dealing with potential disasters helps to safeguard the collection from inherent threats in the museum environment and potential external threats.⁵² These preventative conservation measures may assist in prolonging the existence of the collection and in maintaining the physical material of objects. As the area of preventative conservation expanded, there was concern over protecting museum collections, and cultural heritage as a whole, from the effects of disasters. Heritage professionals in the twentieth century responded to disasters in the form of several major wars and epic flooding and earthquakes – resulting in actions ranging from salvage operations to the development of management guidelines. These events brought forth a strong reaction from the international community to aid and preserve threatened sites and museum collections. It was at this time that disaster risk management began to take a distinct role in the cultural heritage field, expanding from, and beyond, the preventative conservation measures utilized in the previous decades and centuries.

The need for disaster risk management planning can be demonstrated by looking at disasters events of recent memory and the response they engendered. During the twentieth century, many crisis events endangered the world's cultural heritage. These internationally known disasters helped foster a growing awareness

⁵² Susan Bradley, "Preventative Conservation Research and Practice at the British Museum," *Journal of the American Institute for Conservation (JAIC)* 44 (2005):169.

for the need to protect culturally significant monuments, buildings, and museum collections. Some of the first international efforts towards such protection measures followed the physical devastation wrought in World War II (1939-1945). War has a devastating effect on a society – decimating the countryside and the people. But an armed conflict also has a significant effect on cultural heritage. Tangible heritage, such as sculpture and buildings, can often be viewed as symbols of patriotism or a physical embodiment of a shared cultural memory.⁵³ In an assertive attempt to usher in a new era in a country's social or political history, old symbols of power, such as monuments and buildings, may be destroyed. But it is not just the intentional acts of iconoclasm that endanger cultural sites and objects, but other inherent threats of war, such as theft or as collateral damage during battle, that do much harm.

World War II saw damage and loss to cultural heritage due to all these causes. With little or no disaster risk management planning in place, many historic buildings and all the culturally significant objects within them were destroyed in both the Allied and Axis bombing campaigns from Prague to Dresden to London.⁵⁴ In the years prior to the war, Nazi's collected or seized works of modern art and in 1937, put them on view in an exhibition of "Entartete Kunst" or "Degenerate Art."⁵⁵ Also at this time, millions of works of art were seized from their owners and

⁵³ Anne McClanan and Jeff Johnson, "Introduction: 'O for a muse of fire...'," in *Negating the Image*, ed. Anne McClanan and Jeff Johnson (Burlington, Vt: Ashgate, 2005), 3.

⁵⁴ Gabriel Moshenska, "Charred Churches or Iron Harvest?," *Journal of Social Archaeology* 10:1 (2010):11.

⁵⁵ Stephanie Barron, "1937: Modern Art and Politics in Prewar Germany," in *Degenerate Art: The Fate of the Avant-garde in Nazi Germany*, ed. Stephanie Barron (Los Angeles: Los Angeles Museum of Modern Art, 1991), 9-10.

transported to new locations or vanished in the chaos of the war.⁵⁶ One such piece whose fate was unknown was the famous “Amber Room” of the Catherine Palace from Russia, whose interior decorative walls were lost after being looted by Nazi forces in the end days of the war.⁵⁷

It was the quantity and quality of these works of art that were seized and lost that garnered an unprecedented response during the war. In a multi-nation effort the Monuments, Fine Arts, and Archives section of the Allied armies was formed to protect and mitigate the damage done to cultural sites during the combat in the European front of World War II.⁵⁸ From 1943 to 1951, this relatively small group of volunteers worked to protect both movable and immovable cultural heritage – first by focusing on culturally significant structures and then by attempting to track down the stolen works of art.⁵⁹ The efforts of these men and women, though novel at the time, set a precedent for later like-minded volunteers responding to damage done to heritage sites during conflicts. The damage that combat can inflict on cultural heritage is immense, and the rapid response both during and after such an event can mean the difference between saving a work or having the object lost forever.

The threat to cultural heritage caused by World War II also resulted in a desire to protect significant sites and works not only after the conflict was over but before it started as well. One of the first pieces of international legislation created

⁵⁶ Robert Edsel and Bret Witter, *The Monuments Men: Allied Heroes, Nazi Thieves, and the Greatest Treasure Hunt in History* (New York: Back Bay Books, 2009), xiv.

⁵⁷ Patty C. Rice, “The 2003 Reopening of the Amber Room,” *Rocks and Minerals* 79:5 (2004): 303.

⁵⁸ Edsel and Witter, *Monuments Men*, xiv.

⁵⁹ *ibid.*

distinctly for the protection of cultural heritage was the *Convention for the Protection of Cultural Property in the Event of Armed Conflict*, or the *Hague Convention of 1954*.⁶⁰ This convention was drawn up in response to the events of World War II, in which the bombings by both Allied and Axis powers devastated many historic cities and sites. This convention created a protection symbol of a blue and white shield to be placed on objects that were deemed “cultural significant.”⁶¹ The idea was that this symbol would allow all sides of a conflict to easily identify targets to avoid in bombing or artillery fire.

The *Hague Convention of 1954* was one of the first international recommendations to protect cultural heritage from disaster, but it only covered armed conflicts. Cultural heritage also faced threats from natural disasters. As with acts of war, natural disasters such as earthquakes and floods have the potential to cause significant damage to both movable and immovable cultural heritage. As the twentieth century created a more global society, the awareness of the threats that these types of disasters posed to cultural heritage also increased. When discussing natural disasters and cultural heritage, one of the earliest events to garner wide spread international response was that of the devastating floods in Florence, Italy, in 1966.

Florence is a city where the past and present collide. The architectural works of the Renaissance architects still stand majestically in the skyline and the masterpieces of the artists are now exhibited in galleries formed from former

⁶⁰ The Hague, *The Protection of Cultural Property in the Event of Armed Conflict*, the Hague: UNESCO, 1954, accessed <http://unesdoc.unesco.org/images/0008/000824/082464mb.pdf>.

⁶¹ *ibid*, 12.

palaces. The fourteenth-century poet Dante acts as an unofficial tour guide, as quotations from his most famous works are seen on plaques scattered throughout the city.⁶² Though Florence is no stranger to floods,⁶³ on November 4, 1966, the continuous rainfall leading to rising water levels in the Arno River came as a surprise to the residents of the region.⁶⁴ The river water, mixed with sewage and oil from ruptured heating tanks, swept cars and trees aside and burst through the doors of historic churches and palace museums.⁶⁵ The floodwaters peaked at around six meters in the Santa Croce area of the city and began to slowly recede after 8 pm that day. It was only after the waters retreated that the full extent of the damage on the city and cultural resources was known.

In 1966, there was little evidence of an emergency disaster plan in place at Florence's cultural institutions or city as a whole. It was only through the quick thinking of enterprising individuals that some of the priceless works of art were saved from the worst of the flood damage.⁶⁶ These individuals' actions served for only a small percentage of the works in the city center; for in the end, many galleries remained surrounded by stagnant water and thick layers of polluted mud blanketed the city – including thousands of pieces of movable cultural heritage.

⁶² Robert Clark, *Dark Water: Flood and Redemption in the City of Masterpieces* (New York: Doubleday, 2008), 14.

⁶³ In the book *Dark Water* the author Robert Clark cites major floods in 1177, 1333, 1557, 1740, 1844, and 1864, all of which have been memorialized throughout the city with markers at their crest lines. (Clark, *Dark Water*, 6.)

⁶⁴ Franco Nencini, *Florence: the Days of the Flood*, (New York: Stein and Day, 1967), 10.

⁶⁵ Nencini, *Florence*, 10.

⁶⁶ Sandro Pintus, "An Account of the Flood and the Days that Followed," in *Conservation Legacies of the Florence Flood of 1966: Proceedings of the Symposium*, ed. Helen Spande (London: Archetype Publications, 2009), 11-12.

The response to the images of the flooding in Florence was immediate. It was too late to prevent much of the damage the flooding caused, but there was still time to salvage what was affected. This flood took place in a new era of global media, and people around the world watched at the waters swallowed the city – fearing that it may have been lost forever.⁶⁷ Before the waters began to recede, students, professionals, and other humanitarians began campaigning to save the cultural heritage of Florence. Conservation students from England requested time off from class to help with the efforts, filling up vans with supplies and water pumps and then slowly driving through Europe and talking their way past roadblocks to make it into the city. Volunteers from around the world arrived within days to help with the arduous task of sifting through the mud and helping the Florentines to clean out buildings in the flood-affected areas. These volunteers soon became known as “Mud Angels” for their selfless work that they did on behalf of the city.⁶⁸ It can be said that these mud angels were the first responders in cultural disaster relief, or the original disaster response team. Though most had no training in the field, it was through their efforts that much of the works were saved for the treatments conducted later by the conservators.

The Florence Flood of 1966 was one of the first international responses with the specific aim to aid in the recovery of cultural heritage, as people around the world arrived to salvage books, paintings, and other works of art in the months

⁶⁷ *ibid.*

⁶⁸ Edward Kennedy, “Press release 11 November 2006,” in *Conservation Legacies of the Florence Flood of 1966: Proceedings of the Symposium*, ed. Helen Spande (London: Archetype Publications, 2009), xviii-xix.

following the disaster. The volunteers and professionals who came to help with the salvage of the heritage objects and the monetary aid brought forth by the celebrity-endorsed videos,⁶⁹ all foreshadowed the development of later disaster response strategies. The experiences of both natural and man-made international disasters, along with preventative conservation writings, slowly helped to influence and lead to the development of a distinct field for the disaster risk management of cultural heritage.

It was in the 1990s that the new field of disaster risk management of cultural heritage began to grow out of the field of preventative conservation. Heritage professionals at this time were influenced by the past philosophies and writings on preventative conservation, along with the continuing threat of large-scale threats to cultural heritage. This resulted in an increased awareness of the need for disaster risk management strategies specifically targeting cultural heritage. In the periodical *Collections: A Journal for Museum and Archives Professionals*, the rise in disaster risk management awareness was addressed by Catherine Antomarchi, current head of the Collections Unit at ICCROM, when she wrote, “The explicit use of risk management terminology in care of collections began with independent presentations of the concept in 1989 by [N.S.] Baer and by [Robert] Waller and [Sally] Shelton.”⁷⁰ In 1995 that Robert Waller published “Risk Management Applied

⁶⁹ *Florence: Days of Destruction*, film, directed by Franco Zeffirelli (Italy: RAI, 1966). National Gallery of Art, “Florence: Days of Destruction,” Press Release, December 12, 2011, accessed 2012, <http://www.nga.gov/content/ngaweb/audio-video/audio/florence-flood-film.html>

Nencini, *Florence*, 42.

⁷⁰ Antomarchi et al, *Collections*, 120.

to Preventive Conservation” and detailed the hazards that collections face and the steps of planning for a disaster event.⁷¹

Disaster risk management planning has been a growing field within the cultural heritage sector. The damage wrought by storms and armed conflict has demonstrated a need for the field, and though there has been increased awareness of the need for planning for disaster events, as evidenced by the passing of the *Hague Convention in 1954* and the response to the Florence Floods in 1966, it was not until the mid-1990’s that the field took root with multiple publications, most notably those by Robert Waller and Stefan Michalski.⁷² At this time, the past recommendations of preventative conservation professionals, combined with the experiences of heritage professionals during emergency situations, slowly evolved into a general planning strategy for disaster situations. This connection will be further discussed in the next chapter.

⁷¹ Robert Waller, “Risk Management Applied to Preventative Conservation,” in *Storage of Natural History Collections: A Preventative Conservation Approach*, ed. Carol Rose, et al., (New York: Society for the Preservation of Natural History Collections, 1995), 21.

⁷² Catherine Antomachi et al., “Teaching Risk Management of Collections Internationally,” *Collections: A Journal for Museum and Archives Professional* 2:2 (2005): 119-121.

Chapter 3: Risk Assessment & Disaster Risk Management Strategy

The disastrous events of the past century, such as the bombing damage to buildings during WWII and the flooding of art galleries in Florence, proved a need for preventative and recovery strategies for safeguarding cultural heritage. When this sector of the cultural heritage began to gain more exposure, it emerged from the professionals within the field of preventative conservation, whose philosophy greatly influenced the practice and management of disaster planning. Many of the threats that cultural heritage objects face when considering disaster risk management strategies are the same or similar to those addressed as hazards in preventative conservation literature, such as the “inherent vices,” which will be discussed later in the chapter. Both fields have goals in protecting cultural heritage, which allowed for the growth and expansion of the preventative conservation field into key phases of disaster risk management strategies.

The conservation of heritage is one of the key principles of museum work, as stated in the UNESCO definition of museums.⁷³ In the past, conservation was often defined by three functions: examination, preservation, and restoration.⁷⁴ But this view has evolved into conservation practices focusing on the examination, documentation, and analysis of the material with consideration for its cultural

⁷³ Museums,” UNESCO.

⁷⁴ Szczepanowska, Conservation of Cultural Heritage, 9.

significance⁷⁵ and an emphasis on reversible practices taking the forefront. Conservation practices can be both invasive through treatments to stabilize objects or repair damage, and noninvasive through monitoring and documentation. This noninvasive-based conservation is often referred to as preventative conservation and was deemed by the National Park Service (NPS) of the United States as “the most effective method of preservation.”⁷⁶ Preventive conservation practices cover a broad range of activities within the museum. These measures usually involve non-invasive methods to prolong the lifespan of material collections. There are many critical elements of preventative conservation practices, such as artifact handling, storage, and collections management,⁷⁷ all of which start as soon as materials enter into the collection. In relation to disaster risk management, one of the driving forces behind many of these mitigation efforts are the threats to collection material known as the agents of deterioration.

Museum collections can face threats from a variety of sources – both internally and externally. These factors of preventative conservation are important when developing a disaster risk plan, especially when conducting a risk assessment. Early disaster risk management scholarship stressed the importance of identifying risks and ways to categorize the theorized severity of this threat to the collection.⁷⁸

⁷⁵ Randall Mason, “Assessing Values in Conservation Planning: Methodological Issues and Choices,” in *Assessing the Values of Cultural Heritage*, ed. Marta de la Torre (Los Angeles: Getty Conservation Institute, 2002), 19.

⁷⁶ NPS, “Preventative Conservation,” 1.

⁷⁷ Chris Caple, “The History of and an Introduction to Preventative Conservation,” in *Preventative Conservation in Museums*, ed. Chris Caple (New York: Routledge, 2011), 1.

⁷⁸ Robert Waller, “Conservation Risk Assessment: A Strategy for Managing Resources for Preventative Conservation,” in *Reprints of the Contributions of the Ottawa Congress 12-16 September*

Waller's study on risk assessment relied heavily on previous preventative conservation measures, taking into account the potential threat to collections posed by the ten agents of deterioration, which are discussed in detail below.

The Ten Agents of Deterioration

Preventive care combats a variety of threats to collections. Though these hazards may change in each specific example, Michalski and Waller combined the most common threats into an easily remembered list known as "The Ten Agents of Deterioration".⁷⁹ Broken down these agents are: physical forces, vandalism, dissociation, fire, water, pests, pollutants, light, incorrect temperature, and incorrect relative humidity. These vices are not all the threats that collections face, but provide a framework for the preventative conservation measures that an institution can establish. Although some of the agents are not completely preventable, many can be hindered through this practice, greatly extending the life of the collection. Each agent of deterioration has its own unique factors in its potential to harm a collection, but can be connected through the various methods employed in preventative conservation practices.

One of the agents with the most potential to harm a collection is that of physical forces.⁸⁰ Physical forces are actions that cause damage to an object through contact to the material artifact. This damage can be caused by impact, vibration, pressure, abrasion, or shock, and the resulting harm to an object can range from

1994, *Preventative Conservation Theory and Research*, ed. A. Roy and P. Smith (London: IIC, 1994), 12-16.

⁷⁹ Szczepanowska, *Conservation of Cultural Heritage*, 14.

⁸⁰ *ibid.*

stress to deformation or fractures.⁸¹ Though some of these effects may start out as small, over time the fractures and deformation can expand, leading to a total loss of an object if left untreated. Damage caused by physical forces can happen from something as small as improper handling.⁸² This is why there is an emphasis on object handling training within museums. Each material requires different methods of handling and proper training should be given to everyone who may potentially interact with collection material. It is important that those handling the objects know when they should wear gloves since some materials, such as metals, are extremely sensitive to the oils found in hands. These oils can accelerate the corrosion process and leave permanent etchings in the metal.⁸³ Other training recommendations may deal with the cultural aspects of the object, such as properly tying a Japanese silk painting. These scroll paintings must be carefully rolled and then tied with a flat bow. Regardless of the material nature of the collection, one should always remove anything that may cause scratches, dents, or other damage to the objects if it comes in contact with the material. This includes rings, watches, bracelets, and ID badges. Handling the objects in museum collections has the potential to cause wear to the material, but with proper techniques this damage can be minimized.

Physical forces can also originate from something as massive as an earthquake. The vibrations from seismic activity can cause objects to move or shake

⁸¹ "Physical Forces," Canadian Conservation Institute, accessed November 2013, <http://www.cci-icc.gc.ca/resources-ressources/agentsofdeterioration-agentsdedeterioration/chap01-eng.aspx>.

⁸² Charlie Costain, "Framework for Preventative Conservation of Museum Collections," in *Preventative Conservation in Museums*, ed. Chris Caple (New York: Routledge, 2011), 28.

⁸³ Szczepanowska, *Conservation of Cultural Heritage*, 225.

during the events. If they are not properly mounted they can hit each other or fall off a shelf, causing cracking, breaking, or other serious damage. Since physical forces can come from a variety of sources, ranging from human error or natural phenomena, they are one of the key threats to cultural heritage. Whatever the source of the physical forces, measures taken in preventative conservation practices can greatly reduce the potential loss seen to a collection, as well as avert a potential disaster.

Theft and vandalism are also potential threats to collections. This agent of deterioration comes from forces outside the museum, but the institution can enact policies that will help to mitigate the likelihood of this event happening. The threat of theft or vandalism is often a risk because of the high value of museum collections – both monetarily and intrinsically. It is recommended by the Canadian Conservation Institute to prioritize the creation of a Threat and Risk Assessment for both theft and vandalism. This is a checkpoint system used to identify threats to the collection and then develop solutions and security measures associated with those threats.⁸⁴ Though security measures are important when dealing with this agent of deterioration, documentation can also be an effective method. Good documentation of collection material allows for museum staff to more readily identify when something has gone missing, as well as aid law enforcement in its return.⁸⁵ The threat from this agent is especially elevated in times of conflict. This was recently

⁸⁴ “Thieves and Vandals,” Canadian Conservation Institute, accessed December 2013, <http://www.cci-icc.gc.ca/caringfor-prendresoinde/articles/10agents/chap02-eng.aspx>

⁸⁵ Wilbur Faulk and Laurie Sowd, *Collections Theft Response Procedures* (Los Angeles: Getty Conservation Institute, 2001), 10.

witnessed in the ongoing conflict in Egypt. Egyptian museums house vast archaeology and other cultural material, and in 2011, vandals and looters broke into Cairo museums amidst the political turmoil. This included the Egyptian Museum in Cairo, where artifacts were damaged, including two mummies.⁸⁶ The threat in the region still exists as in 2013, thousands of antiquities were stolen from the Malawi Monuments Museum in al-Minya and in January 2014, artifacts were damaged in a bombing outside of Cairo's Islamic Museum of Art.⁸⁷ The acts of violence associated with theft and vandalism greatly threaten cultural heritage, whether it occurs during conflict situations or a heist. It is for this reason that theft and vandalism is a part of disaster risk strategy.

Closely associated with theft and vandalism is the threat of dissociation. Dissociation is when an object goes missing in a collection. This is sometimes the result of mislabeling or poor documentation of location. Though the piece may still be in the museum, it is effectively lost. Poor documentation or cataloging may also aid in collection theft, as the victimized institution may not become aware of the looting until well after the deed occurs. This was recently the case in a series of archive thefts in Northeastern United States, where the accused thieves, Barry Landau and Jason Savedoff, stole historical documents from multiple institutions

⁸⁶ Jennifer Fenton, "Vandals Rip Heads Off Two Mummies in Egyptian Museum," *CNN*, January 30, 2011, <http://www.cnn.com/2011/WORLD/africa/01/30/egypt.unrest.museum/>.

⁸⁷ Associated Press, "Looters Steal Priceless Artifacts from Egyptian Museum Amid Violence," *Fox News*, August 19, 2013, <http://www.foxnews.com/science/2013/08/19/looters-steal-priceless-artifacts-from-egyptian-museum-amid-violence/>.

ICCROM, "Egyptian Heritage Rescue Team Mobilizes in Cairo," ICCROM, January 28, 2014, accessed March 2014, http://www.iccrom.org/ifrcdn/eng/news_en/2014_en/various_en/01_28_first-aiders-Cairo_en.shtml

across four states before being caught. It was only after investigators were sorting through the recovered items that some of those institutions discovered that documents had been stolen.⁸⁸ Dissociation is particularly harmful because it has the potential to affect the integrity of the entire collection, not just the object that is displaced.⁸⁹ This agent of deterioration is best combated through a good cataloging system and proper labels on the museum objects.

One of the most damaging agents of deterioration is fire. Fire has the ability to destroy an entire collection, the museum structure, and even cause loss of human life. Fires can occur at any cultural institution, especially historic house museums that have been retrofitted for modern electrical work.⁹⁰ A variety of causes can start fires in museums from electrical work, HVAC systems, or even from collection material such as cellulose film, which has the potential to combust.⁹¹ Much of collection material is also flammable, which can add fuel to the fire. Fires can cause further injury to collections through smoke, heat, and water damage. In 1990, the Royal Saskatchewan Museum in Canada experienced a devastating fire in which “the First Nations Gallery, where the fire had started, the contents of the room...were almost fully incinerated.”⁹² The fire also caused damage elsewhere from soot

⁸⁸ National Archives, “Barry Landau Sentenced to 7 Years for Theft from National Archives, Other Institutions,” *NARA Press Release*, June 27, 2012. accessed October 2014, <http://www.archives.gov/press/press-releases/2012/nr12-133.html>.

⁸⁹ “Dissociation,” Canadian Conservation Institute, accessed November 2013, <http://www.cci-icc.gc.ca/caringfor-prendresoindes/articles/10agents/chap03-eng.aspx>.

⁹⁰ “Fire,” Canadian Conservation Institute, accessed November 2013, <http://www.cci-icc.gc.ca/resources-ressources/agentsofdeterioration-agentsdedeterioration/chap04-eng.aspx>.

⁹¹ NPS, “Caring for Cellulose Nitrate Film,” *Conserve O Gram*, 14:8 (2004): 1.

⁹² Sarah Spafford-Ricci and Fiona Graham, “The Fire at the Royal Saskatchewan Museum, Part 1: Salvage, Initial Response, and the Implications for Disaster Planning,” in *Journal of the American Institute of Conservation* 39 (2000): 18.

deposition and water.⁹³ After the fire, museum workers spent much time planning before initiating the recovery operation that continued for a year.⁹⁴ It was later deemed that a lack of planning adversely affected the effectiveness and success of the recovery efforts, showing the importance of planning for potential disasters that may arise from threats to collection material.⁹⁵

Water is always a concern for museum collections because many different types of collection material are susceptible to damage from it, and therefore should be considered when developing a disaster risk management plan. Water damage can occur from a slight dampness or be caused by a ravaging flood. Natural disasters, in-house accidents, or technological failures can all be sources of deterioration by water damage. Small amounts of water can cause moisture, which in turn can cause corrosion on metals and mold growth on paper and books. Water and moisture can also cause tide lines to appear on porous objects. Water can also reverse some treatments that were done on objects, as many treatments are completed with materials soluble in water to ensure reversibility. If water damage has occurred, the collection must be surveyed, followed by a conservator carrying out any needed treatments. The severity of damage caused by water can be contingent on the preventative and disaster risk planning steps taken before a disaster occurs. This can be seen when reviewing case study examples of cultural institutions around the Gulf of Mexico affected by Hurricane Katrina in 2005. The Ohr-O'Keefe Museum of Art in Biloxi, Mississippi had a well-developed disaster risk

⁹³ Spafford-Ricci and Graham, "Royal Saskatchewan Museum," 20.

⁹⁴ Spafford-Ricci and Graham, "Royal Saskatchewan Museum," 22-26.

⁹⁵ Spafford-Ricci and Graham, "Royal Saskatchewan Museum," 34.

management plan in place before the hurricane hit the area. As a result none of the collection was harmed, despite extensive damage to the building from a casino barge brought in on the flood waters.⁹⁶ During the same hurricane, the Center for African and African American Studies at Southern University of New Orleans experienced extensive damage to their collection after some sections of it spent up to four weeks underwater.⁹⁷ Other cultural institutions in New Orleans also saw damage to their collections and sites, and though they had a disaster plan in place, most of these plans did not account for the level of flooding in the event of the levees breaking.⁹⁸ The events from Hurricane Katrina show that not only is it important for institutions to know the potential agents of deterioration they face, such as water, but to also plan for the severity of the threat as well.

The sixth agent of deterioration is pests. CCI defines pests as “living organisms that are able to disfigure, damage, and destroy material culture.”⁹⁹ Pests include microorganisms (such as mold), insects, and rodents.¹⁰⁰ Some pests, such as silver fish (an insect that is attracted to paper materials) can be dealt with through freezing at extremely cold temperatures. Organic materials are highly susceptible since many of these pests will use them as a food source. Often when surveying this type of collection material, one may notice small holes clustered together, signaling a potential insect activity. This type of activity should be dealt with immediately before an infestation can occur. A rapid response to this threat can make a

⁹⁶ Kelly and Weinstein, “Rethinking Crescent City Culture,” 17.

⁹⁷ Kelly and Weinstein, “Rethinking Crescent City Culture,” 18.

⁹⁸ *ibid.*

⁹⁹ “Combating Pests of Cultural Property,” Canadian Conservation Institute, accessed November 2013, <http://www.cci-icc.gc.ca/caringfor-prendresoindes/articles/10agents/chap06-eng.aspx>.

¹⁰⁰ Costain, “Framework,” 25.

significant difference in the outcome of the situation, as was seen in the Andy Warhol Museum in Pittsburgh.¹⁰¹

The Andy Warhol Museum contains thousands of objects from contemporary artist Andy Warhol's life and career. Some of these objects, called *Time Capsules*, contained food and other materials, which were highly susceptible to pests.¹⁰² During a cataloging project in 2011, museum workers noticed an infestation of varied beetle species in the workspace containing the Time Capsules. With no pest management plan in place at the museum, the staff had to quickly develop a method of treatment for the pests while not harming the works of art that were the source of the issue.¹⁰³ The infestation was contained to the processing room because of the quick actions of the staff, but since there was no pest monitoring in place at the institution there was a potential for a museum wide infestation if not for the cataloging project going on at that time. This case showcases the importance of having a pest management system in place, and how it is possible for pests to create a disaster within a museum. Though a lesser concern when planning for disasters, pests have the potential to cause great harm to collection material; it is for this reason that it is recommended that heritage institutions develop a pest management plan.¹⁰⁴

¹⁰¹ Amber Morgan and John Samuel Jacobs, "The Accidental IPM Program: A Case Study of Contemporary Art and Archives at The Andy Warhol Museum," (paper presented at MuseumPests 2014 Conference, Williamsburg, VA, March 27-28, 2014). Accessed <http://museumpests.net/wp-content/uploads/2014/04/1-2-Morgan-and-Jacobs-paper.pdf>.

¹⁰² *ibid.*

¹⁰³ *ibid.*

¹⁰⁴ Szczepanowska, *Conservation of Cultural Heritage*, 33-42.

Pollutants or contamination are the seventh agent of deterioration. These can be airborne or produced by contact. They are usually chemical in nature and can result in the disfigurement, corrosion or loss of an object.¹⁰⁵ The type of damage done to collection material varies based on the chemical nature of the pollutant and the material of the artifact. This can be seen on some of the objects featured on the Field Museum of Chicago's webpage concerning preventative conservation. The Field Museum uses this page to show how pollution from the urban traffic environment has tarnished an untreated metal figure and contributed to the embitterment of a piece of barkcloth.¹⁰⁶ Pollutants are not just gaseous but can also be found in liquid form, such as acid rain. In outdoor sculptures or buildings, acid rain can cause corrosion or discoloration, both of which are seen on the Leshan Giant Buddha in China.¹⁰⁷ This colossal outdoor sculpture from the first century C.E. has experienced deterioration in the form of weakened structural elements and a blackening of the sandstone due to industrial pollution.¹⁰⁸ Constant monitoring can help to combat the extent of deterioration seen on objects affected by pollutants.

The eighth agent of deterioration is light and radiation. The adverse effects of prolonged exposure of light to collection materials are well known, as museum professionals have been observing the effects of environmental factors on them for

¹⁰⁵ Costain, "Framework," 31.

¹⁰⁶ "Preventative Conservation," *Field Museum*, accessed December 2014, <http://www.fieldmuseum.org/science/research/area/conserving-collections/preventive-conservation>.

¹⁰⁷ John Mink, "Top 5 Endangered Heritage Sites – Acid Rain," *CyArk*, January 9, 2009, accessed <http://www.cyark.org/news/top-5-endangered-heritage-sites-acid-rain>.

¹⁰⁸ *ibid.*

centuries.¹⁰⁹ Though it is known that light causes fading and other discoloration in cultural material, light must be included in exhibitions so that visitors can see displays. This has led to many studies on the subject with standards for exposure, usually around 50 lux.¹¹⁰ Objects on display are also put on rotation so that they are not always exposed to constant light sources. Other recommendations for this agent have been to turn off the gallery lights when the museum is closed.¹¹¹ An example of light damage includes the observation of fading on the United States *Declaration of Independence* when it was displayed in direct sunlight for years at the Old Patent Office Building in Washington, DC. The document was removed from its original display location and over time different cases were developed to help preserve the precious material.¹¹² Light is a slow acting agent of deterioration. Though the damage done to artifacts may not be as readily apparent as that of fire or water, light can cause irreparable harm if preventative measures are not taken.

The last two agents of deterioration are incorrect temperature and incorrect relative humidity, which are closely related. As discussed earlier, the fluctuation of both can cause damage to collection material. Temperatures too low can cause some materials to become brittle, while temperatures too high may cause some materials to disintegrate or discolor. These effects are closely related to those of

¹⁰⁹ Caple, *Preventative Conservation*, 12.

¹¹⁰ Lux is system of measurement in the International System (SI). 50 lux is approximately equal to an average household light bulb.

¹¹¹ Del Hoyo, "Studying Effects of Light."

¹¹² Julio del Hoyo, "Studying the Effects of Light on Sensitive Museum Objects and Materials and the Application of Research Results in Setting Lighting Levels in Museums" (presented at the Smithsonian Museum Conservation Institute Lecture Series, Suitland, Maryland, 25 June 2009).

incorrect relative humidity. This can be a particular threat to ethnographic collections, which contain many organic materials that are susceptible to such fluctuations. Alaskan spruce root baskets are one such object, as the material has the potential to dry out and may become brittle due to a low relative humidity. On the other extreme, high relative humidity can lead to dampness, which in turn may cause mold growth on the object. The fluctuations in relative humidity can cause shrinkage and swelling that can also bring about stress and breakage on the object.¹¹³ This is why, when visiting a museum, one might see a small hydrometer or datalogger in the case. This is a tool used by museum professionals to monitor the temperature and relative humidity of the enclosed environment. Regular recordings of the readings should be done and placed in a documentation folder or graph to show how it changes over time. Ideally these readings should not change more than 5% within a twenty-four hour period or more than 15% in a month.¹¹⁴ Monitoring these conditions can ensure that objects are not subjected to sharp or drastic changes, which can adversely affect the materials.

These ten agents of deterioration are often linked, like temperature and relative humidity, or can lead to one another, such as fire damage to water damage. These agents influence preventative conservation practices and can also be used in consideration for the establishment of a risk and disaster management plan. Risk and disaster management plans are key elements for preventative conservation

¹¹³ Costain, "Framework," 32.

¹¹⁴ Bradley, "Preventative Conservation," 161-162.

practice in the collections care environment, as they help to identify potential threats to collections and establish a procedure to respond to such threats if an event occurs.

Waller recommended that once these hazards to collections are identified, the collections care staff classify risks as “catastrophic”, “severe”, or “gradual”.¹¹⁵ This range covers the immediate effects of an unexpected natural disaster, such as an earthquake, as well as the slower material breakdown resulting from light or UV radiation. By classifying and identifying the risks to the collections, the museum staff would then be able to devote resources to combat the specific threats, thereby possibly preventing or reducing the overall risk to the collections.

Robert Waller’s strategy of risk assessment was a stepping point in the development of planning for disasters in cultural heritage institutions. Though his strategy focused on the inherent risks to collections, the basic principles can be applied to current disaster risk management strategy, which encompasses those threats both within and outside of the museum environment. Disaster risk management planning is now a process that most museums and cultural organizations include in their institutional practices. The initial risk assessment has developed into a multi-step planning process for museums and archives. Each step shows key areas of consideration that can be taken during each stage of a disaster event, thus protecting the collections.

¹¹⁵ Waller, “Risk Assessment,” 12.

Phases of DRM Planning

Disaster risk management planning is a multi-phase and multi-step process. It involves steps taken to protect cultural heritage from harm that range from the planning process before a disaster strikes to the initiatives taken after one has passed. Though specific disaster risk management plans can be complex,¹¹⁶ the general planning process can be broken down into three distinct phases of preparedness, response, and recovery, which can also be viewed as actions that can be taken before, during, or after an emergency event. Each of these phases has unique steps, of which can then be further divided into separate tasks tailored to each disaster.

A. Phase I: Preparedness

It is before a disaster or emergency strikes that the planning process begins. With planning and preparation before a disaster, a museum can save collection materials, and in the end, much needed staff energy, time, and money.¹¹⁷ The steps in this initial phase of disaster management planning involve preventative measures that can be taken to protect the objects in museum collections and can correspond with other preventative conservation measures that the institution may be undertaking. These steps may be viewed as passive tasks, as they usually do not involve active intervention with the collection, but that does not make them any less important than later measures taken during the planning process. These tasks can help to save time and resources during and after a disaster event. This initial phase

¹¹⁶ Valerie Dorge and Sharon L. Jones, ed., *Building an Emergency Plan: A Guide for Museums and Other Cultural Institutions*, (Los Angeles: Getty Conservation Institute, 1999), 13-17.

¹¹⁷ Szczepanowska, *Conservation of Cultural Heritage*, 42.

of disaster risk management planning is key to the process and there are three main measures that can be considered during this phase: preparedness, mitigation, and assessment.¹¹⁸

Preparedness can be seen in the steps taken to prevent damage to the collection, and as Smithsonian Institution conservator Hannah Szczepanowska writes, "Preparation for emergency requires an understanding of what we are protecting and requires an assessment of the collection value."¹¹⁹ These actions can help to minimize the risk and the impact of the hazards associated with a disaster.¹²⁰ It is during this step that the planning process for a disaster begins. An institution should appoint an individual or a committee to develop or write the plan.¹²¹ The development of the plan will involve the coordination of many departments, as all could be called upon to respond to an emergency situation.

Part of this preparation involves the identification of the risks and threats to the collection. It is important to identify the risks that have the most potential to harm a collection, as these will be the primary focus of the disaster risk management plans.¹²² Some of these risks may be taken from the earlier discussed list of "Ten Inherent Vices", which stem from the museum environment. Others may come from the institution's geographic location – such being in a flood plain or

¹¹⁸ Dorge and Jones, ed., *Building an Emergency Plan*, 16-17.

¹¹⁹ Szczepanowska, *Conservation of Cultural Heritage*, 44.

¹²⁰ UNESCO, *Disaster Planning: Prevention, Preparedness, Recovery*, UNESCO, 3-4.

¹²¹ John Hunter, "Museum Disaster Preparedness and Planning," in *Preventative Conservation in Museums*, ed. Chris Caple (New York: Routledge, 2011), 147.

¹²² Jordan Ferraro and Jane Henderson, "Identifying Features of Effective Emergency Response Plans," *Journal of the American Institute for Conservation (JAIC)* 50 (2001): 44.

seismically active zone.¹²³ Knowledge of such geographic and environmental hazards will help in the planning process, allowing for mitigation steps to be taken before a disaster can strike.

UNISDR defines mitigation as “the lessening or limitation of the adverse impacts of hazards and related disasters.”¹²⁴ As with the preparedness step, mitigation in the museum environment can be used as a tool to protect collection materials through risk reduction efforts. In reducing the risks to the collection material, the museum can help to ensure the safety of the object in a disaster event. Though mitigation may not eliminate the threat, the preventative steps may make the difference between the complete destruction of a material and partial damage.¹²⁵ One such area that this can be seen is in museum storage. The storage environment of museums often holds large concentrations of objects and materials in a small, defined space. The storage space of a museum can be tailored to reduce some of the potential risks and hazards that have been identified in the previous step, such as in the case of an institution in an earthquake-prone area. With this knowledge the potential damage can be lessened by securing the storage spaces through caged or barred shelving to prevent objects from falling during seismic shaking. Another potential strategy to mitigate damage in storage is with padded mounts or mounts that can be tied down to prevent damage from vibrations and shaking in the event of

¹²³ Szczepanowska, *Conservation of Cultural Heritage*, 44.

¹²⁴ “Terminology: M”, UNISDR, accessed June 2014, <http://www.unisdr.org/we/inform/terminology#letter-m>

¹²⁵ FEMA, *Before and After Disasters: Federal Funding for Cultural Institutions*, FEMA 533 (Washington, DC: FEMA, 2005), 3.

an earthquake.¹²⁶ Though these measures may not ensure that collection material is left completely unscathed in such an event, the potential for damage has been reduced with the mitigation steps taken as part of the overall planning process.

The steps of disaster risk management planning taken before a disaster can help with reducing the risk to the collection before a disaster strikes, but they can also help with the response and recovery of the later phases of the planning process, such as assessment. Assessment is the third step in the initial phase of disaster risk management planning. Assessment can be used to inventory and keep track of collections, both in times of emergency and during normal operation procedures. One such way is through conducting condition surveys. A condition survey acts as an audit of the collection.¹²⁷ It records the state of the objects, the materials included in the collections, and location of artifacts in the museum, whether on display in the galleries or in storage. The information gathered during the condition survey helps in the preparation planning, as the material collection may require specific supplies to be readily accessible during the recovery process, such as chemicals for cleaning or storage containers.¹²⁸ The collections condition survey can also double as an inventory, which can assist the museum staff in prioritizing objects for evacuation in the event of an emergency based on condition, material, or curatorial value.¹²⁹ Assessing the collection before a disaster can also be used as a check of the records to ensure that the registered museum number corresponds to the label on the

¹²⁶ Dorge and Jones, ed., *Building an Emergency Plan*, 55.

¹²⁷ Keene, "Collections Condition," 395.

¹²⁸ Szczepanowska, *Conservation of Cultural Heritage*, 44.

¹²⁹ Theresa Satterfield, "Numbness and Sensitivity in the Elicitation of Environmental Values," in *Assessing the Values of Cultural Heritage*, ed. Marta de la Torre (Los Angeles: Getty Conservation Institute, 2002),

object, or to ensure that the object contains a physical label.¹³⁰ All of these tasks assist in the preparedness stages of planning, as the assessments ensure that there are accurate and current records of the collection. These records can be used to make sure all the material is accounted for and to what extent the collection has been damaged.

B. Phase II: Response

The tasks of the initial phase are key to the effectiveness in the later phases of planning. The second phase of disaster risk management planning is the response during a disaster.¹³¹ Since the response often occurs concurrently with the disaster, there is limited time to make decisions before putting them into action. This is why the preparation is so important. As with the initial phase, assessment is also an important step in the second phase of planning. The first assessment during a disaster is the safety of those individuals responding.¹³² After it is deemed safe for museum staff to access the collection, assessment can be a tool used to help the responders make rapid, but accurate evaluations of the condition of the affected collections and where to move the collections.¹³³ This process should have clear documentary records, both photographic and written, to assist in assessing the damage caused by the disaster and the overall recovery process.¹³⁴ These records can be used as reference for later events or case study examples.

¹³⁰ Szczepanowska, *Conservation of Cultural Heritage*, 48.

¹³¹ FEMA, *Before and After Disasters*, 3.

¹³² Dorge and Jones, ed., *Building an Emergency Plan*, 90.

¹³³ Dorge and Jones, ed., *Building an Emergency Plan*, 16.

¹³⁴ Szczepanowska, *Conservation of Cultural Heritage*, 45.

Response also hinges on the museum communications plan. Part of the planning process involves the chain of command, as well as who should be contacted when a disaster occurs.¹³⁵ Whether there is forewarning or not to the disaster event, certain individuals in the museum hierarchy have to be contacted before some objects can be moved to a new, safer, location. Effective communication also involves plans on who to contact outside of the cultural institution.¹³⁶ This could involve coordination with other relief agencies in the event of a large-scale disaster, such as an earthquake, in which there are other first responders and humanitarian organizations with whom the museum officials may need to assist in recovery efforts.

C. Phase III: Recovery

The final phase in the disaster risk management planning process is the recovery phase. The recovery phase begins after the disaster is officially declared to be over, and involves the salvage operation. This consists of tasks needed to secure, store, and treat the recovered items. Important in the planning process is listing and acquiring the materials and resources that will be needed during this step. By having the materials on hand, institutions can begin the salvage operation as soon as officials have declared the site safe. Salvage operations, also, usually necessitate the creation of a triage space in order to assess and secure the artifacts.¹³⁷ As in the pre-disaster phase, one of the tasks after the response is to assess the condition of the

¹³⁵ Ferraro and Henderson, "Identifying Features," 36.

¹³⁶ Stephanie Watkins, "Developing Statewide Emergency and Disaster Preparedness Expertise," *Journal of the American Institute for Conservation (JAIC)* 39 (2000): 171.

¹³⁷ Szczepanowska, *Conservation of Cultural Heritage*, 45.

recovered objects. This assessment can be used to prioritize the later treatment of the objects.¹³⁸

The final step in the recovery process is the treatment of the objects damaged during the disaster. In the previous phase, the triaged objects would have been prioritized for later treatment based on condition. Some treatments may be done immediately, such as freeze-drying paper based material to prevent mold growth, while others may be done months after an emergency situation, such as repairing a broken ceramic.¹³⁹ This is a time-consuming process and may take many years to complete.

Though disaster risk management planning can be split into three phases, it is a cyclical process. The tasks involved in safeguarding a collection are not only considered in an emergency situation, but can be in constant flux and reviewed. The monitoring and reviewing of the plan is part of the management aspect of disaster risk management.¹⁴⁰ Reviews help to ensure that the plan is still relevant to the museum's collection, as well as making sure that all staff members are aware of the plan. Communication of the plan is a key component to overall effectiveness of the plan. The development and implementation of these plans help a museum to save cultural material and in turn help the institution to save financially.¹⁴¹ The

¹³⁸ Szczepanowska, *Conservation of Cultural Heritage*, 43.

¹³⁹ CCI, "Emergency Preparedness for Cultural Institutions: Introduction," *CCI Notes* 14/1 (Ottawa: Canadian Conservation Institute, 1995), 2.

¹⁴⁰ Dorge and Jones, ed., *Building an Emergency Plan*, 12-13.

¹⁴¹ Szczepanowska, *Conservation of Cultural Heritage*, 42.

preparation of the plans can also help to streamline the recovery process, thus ensuring that any salvage operations are timely and organized.¹⁴²

Disaster risk management planning strategy for cultural institutions has grown out of preventative conservation practices with the common goals of preserving and protecting cultural objects. As the cultural heritage sector has devoted more time to disaster risk management planning, distinct guidelines have been developed by both international and national cultural heritage and institution organizations. These guidelines will be discussed in the next two chapters.

¹⁴² *ibid.*

Chapter 4: International Guidelines for Disaster Risk Management

In the past century, the preservation of cultural heritage has taken more precedence on the international front. International organizations, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Council of Museums (ICOM), have dedicated resources to the preservation and protection of diverse cultural heritage assets. As the growing need for disaster risk management in the cultural heritage field became apparent with the damage resulting from the rise in natural and man-made disasters affecting historic sites and museums, international organizations also began to produce recommendations specifically on disaster risk management for objects and sites of cultural heritage.

One of the most recognizable names in the international field of cultural heritage is UNESCO. UNESCO has a long-standing tradition of protecting cultural heritage. Founded in 1945, after the chaos of multiple world wars, the organization became known as an “‘intellectual’ agency” of the newly formed United Nations.¹⁴³ UNESCO’s mission to bring peace through education, cultural understanding, and scientific discovery is expressed through multiple acts and conventions. The protection of cultural heritage through UNESCO discourse began in 1972 with the passage of the *Protection of the World Cultural and Natural Heritage Convention*, or

¹⁴³ “Introducing UNESCO,” UNESCO, accessed July 2014, <https://en.unesco.org/about-us/introducing-unesco>.

simply the *World Heritage Convention*.¹⁴⁴ UNESCO cites the impetus of the convention as the creation of the Aswan High Dam in Egypt, which required the flooding of a valley containing the ancient site of Abu Simbel.¹⁴⁵ This garnered international attention and ultimately a campaign that led to the moving of the temples to higher ground in order to save them from destruction.¹⁴⁶ The *World Heritage Convention* strives to protect the integrity and authenticity of both natural and built sites, which are deemed “universally culturally significant,” through preservation and management policies. Through this convention, sites are nominated for listing on the World Heritage List. Once inscribed, they are eligible for international awareness and funds help to preserve the site from potential destruction.¹⁴⁷ The *World Heritage Convention* also allowed UNESCO to create a “list of World Heritage in Danger.”¹⁴⁸ This list emphasized international awareness of threatened sites, rather than specific management planning strategies to mitigate such threats. Though the *World Heritage Convention* calls attention to the protection and preservation of sites inscribed onto the World Heritage List, it was not until 2009 that UNESCO directly addressed the issue of disaster risk management planning for these areas of significant cultural heritage.

In 2008, the Hellenic Ministry of Culture and the UNESCO World Heritage Centre organized the *Workshop on Disaster Risk Management at World Heritage*

¹⁴⁴ UNESCO, *Convention Concerning the Protection of the World Cultural and Natural Heritage*, Paris: UNESCO, 16 November 1972, Accessed <http://whc.unesco.org/archive/convention-en.pdf>.

¹⁴⁵ “The World Heritage Convention,” UNESCO, accessed July 2014. <http://whc.unesco.org/en/convention/>

¹⁴⁶ *ibid.*

¹⁴⁷ UNESCO, *Convention Concerning*, 8.

¹⁴⁸ UNESCO, *Convention Concerning*, 6.

Properties, which produced the *Olympia Protocol for International Cooperation* in 2009.¹⁴⁹ The workshop met to discuss issues within the field, including the lack of disaster risk management plans for world heritage sites and the lack of inclusion of heritage sites within the existing regional disaster risk mechanisms.¹⁵⁰ The *Olympia Protocol* rationalizes the need for such plans as integral for the overall preservation and protection of the sites, which connects to the original goal of the *World Heritage Convention*. The protocol states:

Strengthening disaster risk management for properties inscribed in the World Heritage List, therefore, is necessary to prevent and reduce damage from disasters and preserve their cultural and natural values, thus protecting an essential support for the social and economic well-being their communities.¹⁵¹

To meet this goal of strengthening the disaster risk management at the World Heritage sites, the *Olympia Protocol* suggests the establishment of workshops and resource material.¹⁵² These activities are seen as educational tools that can further develop the skills of those managing the sites.

The first recommendation of the *Olympia Protocol*, under section 3.1, is to “establish a Clearing House on Disaster Risk Reduction.”¹⁵³ This recommendation involves the creation of an information hub – a single location of reference material on disaster risk reduction and management.¹⁵⁴ This activity would allow heritage professionals to have a known portal to access relevant materials for the protection

¹⁴⁹ UNESCO, *Strengthening Disaster Risk Reduction at World Heritage Properties: the Olympia Protocol for International Cooperation*, Olympia: UNESCO World Heritage Centre, 2009.

¹⁵⁰ UNESCO, *Olympia Protocol*, 4.

¹⁵¹ *ibid.*

¹⁵² UNESCO, *Olympia Protocol*, 5.

¹⁵³ UNESCO, *Olympia Protocol*, 7.

¹⁵⁴ *ibid.*

and preservation of their sites pertaining to disaster risk management. In the event of a crisis, time is at a premium, as the potential to salvage damaged materials may be hindered by the amount of time left untreated. An information hub could allow professionals to save time spent researching various source outlets, and apply that towards the recovery efforts. Gathered information can aid in the planning and execution of disaster risk management plans for heritage professionals around the globe.

Another aspect of the *Olympia Protocol* is the emphasis on the spreading awareness of disaster risk reduction and educating those who interact with the World Heritage sites. The *Olympia Protocol* promotes workshops and other related activities to foster this dissemination of knowledge.¹⁵⁵ Such activities are recommended as they can create an information exchange between professionals to further develop planning measures. They can also help to create greater awareness within the community around the site about the vulnerabilities that the heritage center faces. With a greater awareness of the potential harm caused by risks and hazards at the sites may cause decreases through the watchful eyes of the managers and visitors.¹⁵⁶ Information and education on risk management is a key step in establishing disaster risk management policies, as well as furthering the protection and preservation of the heritage sites.

Also recommended by the *Olympia Protocol* is performing risk assessments at select sites. The purpose of this recommendation is to define the risks at each

¹⁵⁵ UNESCO, *Olympia Protocol*, 7-10.

¹⁵⁶ Corine Wegner and Marjan Otter, "Cultural Property at War: Protecting Heritage during Armed Conflict," *The Getty Conservation Institute Newsletter* 23:1 (2008): 9.

site, leading to identifying priorities for later intervention.¹⁵⁷ This is an essential step in developing a later disaster risk management plan for the entire site. Once the risks are established, proper mitigation steps can be taken, as well as preparedness measures in the event of a recovery operation. Though the *Olympia Protocol* calls for risk assessments at “pilot sites” only, it is a measure that would benefit all cultural sites and collections, as the risks and hazards at a site have the potential to escalate into a disaster situation if unattended.¹⁵⁸ Identification of these vulnerabilities is key to protecting the site.

Another important aspect of the *Olympia Protocol* is the emphasis on communication measures. In the event of an emergency, knowledge of proper communication channels and effective means of correspondence can streamline the process and allow for faster response.¹⁵⁹ It is not just during an emergency that communication is important, but before an event as well. Within a museum, the staff should be aware of proper communication channels for reporting a risk.¹⁶⁰ It is not just professionals at the sites or institutions that need to have knowledge of emergency procedures, but also visitors or residents near the sites as well. It is people who are given the first priority when responding to a disaster, the heritage is considered second.¹⁶¹ By educating those who interact with the heritage sites or institutions, an active community for safeguarding the site is developed. It also can

¹⁵⁷ UNESCO, *Olympia Protocol*, 8.

¹⁵⁸ June Taboroff, “Cultural Heritage and Natural Disaster Incentives for Risk Management and Mitigation,” in *Managing Disaster Risk in Emerging Economies*, ed. Alcira Kreimer and Margaret Arnold (Washington, DC: World Bank, 2000), 78-79.

¹⁵⁹ Dorge and Jones, ed., *Building an Emergency Plan*, 74.

¹⁶⁰ Dorge and Jones, ed., *Building an Emergency Plan*, 76.

¹⁶¹ Dorge and Jones, ed., *Building an Emergency Plan*, 90.

help to sensitize the community to the practices of disaster risk management and help to prevent panic in the event of an emergency response effort.¹⁶²

Though the recommendations under the *Olympia Protocol* refer to World heritage sites, and therefore mostly immovable cultural heritage, these recommendations can be applied to movable heritage in the museum setting. Information is critical for museum professionals to develop effective plans, and the material and references gathered as a result of the first recommendations could greatly assist in this cause. By establishing a single known location of reference material, time spent researching during an emergency situation can be greatly reduced. The recommendations put forth by this protocol help to educate professionals, both at sites and in museums, to make informed and thought-out decisions in disaster risk management.

UNESCO is not the only international organization seeking to guide heritage professionals in the disaster risk planning process. Like UNESCO, the International Council of Museums (ICOM) is a non-governmental organization dedicated to the preservation and conservation of global heritage. Headquartered in France and established in 1946, ICOM's mission includes guiding museum professionals in an exchange of knowledge, establishing standards for care in museums, and preserving both tangible and intangible heritage.¹⁶³ In accordance with this mission, one of the organization's international focus areas is the Museum Emergency Programme, which focuses on the research, training, and implementation of risk management

¹⁶² UNESCO, *Olympia Protocol*, 12.

¹⁶³ "ICOM Missions," ICOM, accessed August 2014, <http://icom.museum/the-organisation/icom-missions/>.

practices.¹⁶⁴ In connection with this program and that on Museum Protection and Security, ICOM published a “Guideline for Disaster Preparedness in Museums” in 1993.¹⁶⁵ This document features recommendations on procedures before, during, and after an emergency, as well as aspects of overall management. The guidelines promote three themes: an institutional-wide awareness of the plan, efficiency of staff response, and adequate collection care.¹⁶⁶

The ICOM guidelines suggest building awareness of disaster risk plans through the involvement of all those who interact with the cultural heritage contained in an institution.¹⁶⁷ This involvement includes both employees of a museum and the visitors, as both play a part in emergency proceedings. If an emergency happens during operating hours, staff will have to safely evacuate all individuals from the hazard site before acting on safeguarding the collection.¹⁶⁸ If there is awareness amongst the visitors of the proper procedures in such a case, then there is less chance of panic during an emergency and that will also lower the potential harm that may befall the individuals or collection material.

It is also important that all of the staff members are aware of the disaster risk plan at the institution. Anyone who is a member of the museum’s staff may be called upon to act in the case of a disaster. Knowing their specific roll to play or who to report to can streamline response in a potentially chaotic situation. To support this

¹⁶⁴ “Museum Emergency Programme,” ICOM, accessed August 2014.

<http://icom.museum/programmes/museums-emergency-programme/>.

¹⁶⁵ ICOM, *Guidelines for Disaster Preparedness in Museums*. ICOM, 1993, accessed http://icom.museum/fileadmin/user_upload/pdf/Guidelines/guidelinesdisasters_eng.pdf.

¹⁶⁶ ICOM, *Guidelines*, 3.

¹⁶⁷ *ibid.*

¹⁶⁸ Dorge and Jones, ed., *Building an Emergency Plan*, 90.

awareness the guidelines suggest instituting training programs with the staff, including drills to orient them on emergency operations.¹⁶⁹ The drills and training programs are important as they can allow the museum staff to efficiently carry out proper procedures during an emergency, including situations where outside assistance from relief agencies may not be immediately available.¹⁷⁰ This allows for a self-contained response and a reliance on the museums own resources to contain and recover from a disaster situation. With the knowledge and training on emergency situations and response proceedings, museum professionals can act immediately in the efforts to safeguard the collection materials.

The museum staff may not always be able to rely on their own resources. The efficiency of the staff's response during a disaster is also linked to their knowledge on the proper communication channels. The ICOM guidelines state:

Conservation, fire, and protection officials must communicate effectively in order to work under emergency conditions effectively. They work as a well integrated team with rapid, accurate, and reliable communications.¹⁷¹

This communication involves knowledge of the chain of command, as well as whom individuals should contact to communicate any special considerations that may have to take place when emergency workers are dealing with cultural material.¹⁷² This can be seen in any event that requires outside assistance, such as the Haiti Earthquake in 2010. In this disaster, emergency groups from multiple national and

¹⁶⁹ ICOM, *Guidelines*, 5.

¹⁷⁰ ICOM, *Guidelines*, 6.

¹⁷¹ ICOM, *Guidelines*, 2.

¹⁷² Watkins, "Developing Statewide Emergency," 171.

international agencies were on the ground for a complex salvage operation. Some of these groups included heritage professionals sent from the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and the Smithsonian Institution. This team worked with soldiers from Japan working under the United Nations. The military personnel were able to provide both equipment and manpower to dig through the rubble of a cultural center for heritage objects that had been buried in the aftermath of the earthquake. The heritage team provided quick instruction on methods of salvage and handling of material, and the two groups worked together in the recovery effort.¹⁷³ By being able to communicate needs while working together, the separate emergency response agencies promoted the efforts to protect and preserve cultural heritage.

The third theme of the ICOM guidelines deals with collection care and the preparedness aspect of the museum disaster risk plans. This includes performing a risk assessment of the collection and having adequate supplies on hand in order to respond to a disaster.¹⁷⁴ Risk assessments assist the museum staff in determining the potential hazards to the collection as well as survey the material aspect of the collection. With this information, the staff can gather the supplies that would be needed to treat and store artifacts that are damaged or moved during a disaster situation. ICOM also suggests that museums make lists of area conservators available for immediate consultation in the event of an emergency.¹⁷⁵ This

¹⁷³ Stephanie Hornbeck, "Preserving the Centre D'Art Collection," in *Saving Haiti's Heritage: Cultural Recovery After the Earthquake*, ed. Richard Kurin (Washington DC: Smithsonian Institution, 2011), 137.

¹⁷⁴ ICOM, *Guidelines*, 5.

¹⁷⁵ ICOM, *Guidelines*, 4.

preparation can be crucial as some material has a finite window of time to treat once damaged. This can be seen in the example of archival material, which is usually paper-based. In the event of a fire or flood, such as the 2000 fire at the National Archives and Records Administration (NARA) building in Maryland, USA. In cases such as this, the material can be damaged by both flames and water used to put out the fire.¹⁷⁶ The damp material can quickly grow mold if left untreated, so the first forty-eight hours is considered the most important.¹⁷⁷ It is often the case that this material will be treated through air drying or freeze-drying in order to prevent mold growth. Both methods require proper equipment, whether it is racks for drying or refrigerator trucks for freezing.¹⁷⁸ In order to treat the documents quickly, it is important for the institution to have the information of a facility with the proper equipment or to have the equipment available on site. In the case of the NARA fire, the rapid response and preparation by the archival team aided their efforts to save the damaged documents, demonstrating the importance of this ICOM guideline.

The ICOM Guidelines for Disaster Preparedness in Museums include suggestions and recommendations focused on the safeguarding of cultural heritage material in the event of emergencies. As with the UNESCO recommendations in the Olympia Protocol, there is an emphasis on spreading knowledge of disaster risk management and creating awareness initiatives. This is also supported on the

¹⁷⁶ National Archives, "Statement on Records Center Fire, National Archives and Records Administration," *NARA Press Release*, March 1, 2000, accessed August 2014, <http://www.archives.gov/press/press-releases/2000/nr00-42.html>.

¹⁷⁷ Susan Page, "Fire Recovery: a Case Study," Suitland, MD: National Archives and Records Administration, accessed March 2014, <http://www.archives.gov/preservation/conservation/fire-recovery.pdf>.

¹⁷⁸ *ibid*

international level through programs sponsored by ICCROM and the International Council on Monuments and Sites –International Committee on Risk Preparedness (ICOMOS-ICORP). Both organizations offer training programs that involve a short intensive course with a select group of individuals coming from all over the world who are in the position to use the instruction to further educate others.¹⁷⁹ The success of such programs is demonstrated through the projects the former participants undertake, for example the co-founding of the Egyptian Heritage Rescue Team by a former participant of ICCROM’s First Aid to Cultural Heritage. This response team uses the methods and instruction gained from the course in their practice, as was seen in the 2014 bombings outside Cairo’s Museum of Islamic Art.¹⁸⁰

The cultural organizations at the international level promote the training and dissemination of knowledge on the subject of disaster risk management. These organizations believe that instruction, practice, and simulation will help professionals prepare for the unique situations that may happen in their home institutions. The shared knowledge among professionals will help to further inform staffers on effective strategies and methods. The communication between all of these groups and individuals is also a key component when working for the

¹⁷⁹ Both programs are multi-agency efforts that aim to instruction participants through simulation, training, and workshops. Further information can be found in the course announcements: Ritsumeiken University, Cultural Heritage and Risk Management of Cultural Heritage (http://www.rits-dmuch.jp/en/project/itc_2014.html) and ICCROM’s First Aid for Cultural Heritage (<http://www.iccrom.org/courses/first-aid/>)

¹⁸⁰ ICCROM, “Egyptian Heritage Rescue Team mobilizes in Cairo,” ICCROM, January 28, 2014, accessed March 2014, http://www.iccrom.org/ifrcdn/eng/news_en/2014_en/various_en/01_28_first-aiders-Cairo_en.shtml.

common goal of safeguarding international and national treasures. These are themes that continue when discussing the disaster risk management of cultural heritage on the national level.

Chapter 5: National Guidelines for Disaster Risk Management

In discussing disaster management of cultural heritage on the national level within the United States of America, this section will focus on three organizations: the Federal Emergency Management Agency (FEMA), the National Park Service, and the American Alliance of Museums (AAM). FEMA is the national disaster response agency, the National Parks Service manages the federal cultural heritage sites, and AAM is a non-government organization for museum professionals. Though these three organizations all have different missions, they have a common bond in disseminating information for heritage professionals and providing guidelines for protecting cultural heritage in times of crisis.

A. Federal Emergency Management Agency

FEMA became a formal national agency through a presidential order in 1979 as an organization dedicated to preparing, mitigating, and responding to national disaster situations.¹⁸¹ Though FEMA has widespread recognition for its humanitarian response to disasters, they also work with State Historic Preservation Offices (SHPOs) and Tribal Historic Preservation Offices (THPOs) when a disaster happens at a site of cultural significance, as is required according to the National Historic Preservation Act.¹⁸² As a national organization FEMA responds to cultural

¹⁸¹ "About the Agency," FEMA, accessed August 2014, <http://www.fema.gov/about-agency> .

¹⁸² FEMA, *Historic Preservation and Cultural Resources*, accessed http://www.fema.gov/media-library-data/20130726-1533-20490-9000/historicpreservationcultural_resources_2012.pdf .

emergencies only “when a disaster exceeds the capabilities of local and state resources”¹⁸³; those managing the site must also have a FEMA-approved disaster risk management plan in order to receive aid.¹⁸⁴ To simplify their guidelines for the SHPOs and THPOs, FEMA has split their assessment guidelines into four categories: mitigation planning, hazard identification, plan development, and implementation of the plan.¹⁸⁵

Within the FEMA guidelines, the mitigation planning phase focuses on building awareness. This is done both within the community and within the institution or site. To begin the process, FEMA recommends that the initial planning steps begin with assessing the potential for community involvement.¹⁸⁶ Community involvement brings together the heritage professionals and those that interact or live around the historic property or cultural collection.¹⁸⁷ As the community consists of those individuals that are geographically most likely to be part of the group of first responders to a disaster, it is important that they have proper training and knowledge of the steps to take when interacting with the heritage objects. It is also important that these individuals know whom to communicate within the chain of command when responding and recovery efforts.¹⁸⁸ This could consist of the local emergency management agencies or agencies that provide funding such as FEMA,

¹⁸³ FEMA, *Before and After Disasters*, 19.

¹⁸⁴ FEMA, *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning*, FEMA 386-6, (Washington, DC: FEMA, May 2005), ii.

¹⁸⁵ FEMA, *Integrating Historic Property*, i.

¹⁸⁶ FEMA, *Integrating Historic Property*, 1-1.

¹⁸⁷ FEMA, *Integrating Historic Property*, 1-2.

¹⁸⁸ FEMA, *Integrating Historic Property*, 1-3.

SHPOs or THPOs, the National Endowment of the Arts, among many others.¹⁸⁹ FEMA recommends these outside consultants be included in the planning team to strengthen the awareness between such agencies and to build on the communication channels.

Once community awareness of the need for disaster risk planning at the cultural site or institution is established, FEMA suggests a comprehensive risk assessment.¹⁹⁰ As other organizations have stressed, this phase in the planning process is key to the development of proper mitigation and response strategies. The hazards and risks that an institution faces are as unique as their collection. Identifying the potential risks and the likelihood of them occurring due to the geographic location of the institution and the material nature of the collection will allow heritage managers to create a prioritized list of the potential and magnitude of the hazards.¹⁹¹ This step can be time consuming, as it may involve research into the history of natural disasters that have affected the area as well as frequency of that event, but can be crucial when preparing for such an occurrence. Foreknowledge of the potential threats and risks can allow the heritage professionals to develop preventive measures as well as collect adequate supplies for the event of recovery.

The risk assessment helps to highlight the unique challenges that the institution may face and helps the disaster risk management planning team develop their strategies for safeguarding the collection. These identified risks can then be

¹⁸⁹ FEMA, *Before and After Disaster*, 19.

¹⁹⁰ FEMA, *Integrating Historic Property*, 2-1.

¹⁹¹ *ibid*

Waller, "Risk Assessment," 12-16.

analyzed and used to formulate goals and objectives when developing the disaster risk management plan.¹⁹² The development of the plan must consider each step of the process and resources available for the execution of those tasks. The information and documentation gathered in the previous phases can then be used to determine the resources needed for the eventual implementation of the plan.

The final phase of disaster risk management planning in the FEMA guidelines is the implementation and monitoring of the plan. During this phase FEMA recommends reviewing the plan, updating the information within it and on the collection, and evaluating the interagency agreements.¹⁹³ It at this time the relevance of training exercise and drills becomes apparent. Both forms of simulation practice will give the site employees experience in responding to potential threats, which will enable them to act in an effective fashion when faced with a real situation.¹⁹⁴ Training is not the only way to effectively monitor the disaster risk plan at an institution. A plan is only as good as the information provided within it. Some museums may create a plan when required and not update it for years, or even decades. During this time collection material could have changed, as well as some of the strategies or technology used in safeguarding collection material. For this reason it is important to keep the disaster risk plan up to date with current information gathered from all the previous steps in the planning process.

¹⁹² FEMA, *Integrating Historic Property*, 3-3.

¹⁹³ FEMA, *Integrating Historic Property*, 4-1.

¹⁹⁴ Watkins, "Developing Statewide Emergency," 166-168.

All of the steps within the guidelines are connected, showing the process cyclical.¹⁹⁵ Research is needed to identify potential hazards, evaluation of the collection will inform the custodians of the risks inherent in the collection material, risk assessment can be used to develop a plan, and the implementation of the said plan is used to safeguard collection materials. All steps are needed in order to build a plan.

Despite following all the recommendations provided by FEMA, cultural institutions still experience damage or loss due to a disaster. An example of this is the Museum of Art on the University of Iowa's campus. This museum is located in a floodplain and in 2008, the area experienced a devastating level of flooding.¹⁹⁶ Forewarned the cultural institution evacuated the artwork before the flood, but the building sustained damage. During the recovery efforts the university applied to FEMA for funding to rebuild the museum in a safer location. The FEMA funding is able to provided also comes with strict guidelines,¹⁹⁷ and unfortunately since less than fifty percent of the building was damaged the aid request for a new building was denied.¹⁹⁸ The university museum was at an impasse as the relocation of the institution was required for the continued insurance of the collection and

¹⁹⁵ FEMA, Integrating Historic Property, 3-41.

UNESCO, Managing Disaster Risks, 13.

¹⁹⁶ Judith Dobrzynski, "University of Iowa Museum Takes a Step Forward," *ArtsJournal*, June 6, 2013, accessed February 2015, <http://www.artsjournal.com/realcleararts/2013/06/university-of-iowa-museum-takes-a-step-forward.html>.

¹⁹⁷ FEMA, Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning, FEMA 386-6, (Washington, DC: FEMA, May 2005), ii.

¹⁹⁸ Vanessa Miller, "Architect Named for New University of Iowa Museum of Art," *The Gazette*, February 23, 2015, accessed February 2015, <http://thegazette.com/subject/news/education/higher-education/architect-named-for-new-university-of-iowa-museum-of-art-20150223>.

government funding was continually denied upon appeal. Eventually, in 2014, the university found a private partner to aid in the development of new permanent structure for the collection.¹⁹⁹ Here the UI Museum of Art made efforts to mitigate future disasters by moving the location of their institution. Though funding can be provided for the recovery process by FEMA, certain parameters must be met. The decisions are not always favorable for the cultural institution, resulting in an extended recovery process.

B. National Park Service

FEMA is not the only federal agency in the United States with guidelines on handling cultural heritage material in a disaster situation. In the United States of America, federal cultural heritage is managed by the National Park Service (NPS) under the Department of the Interior. Though known mostly for their efforts in conserving natural landscapes, the National Park Services is responsible for over 120,000,000 objects in museum collections.²⁰⁰ To protect and preserve these collections, the National Park Service has published guidelines and recommendations through *Conserve O Grams* and the *NPS Museum Handbook*, which can also be accessed on their website. These publications emphasize the aspects of

¹⁹⁹ *ibid.*

²⁰⁰ "About Us," National Park service, "last modified 2014, <http://www.nps.gov/aboutus/index.htm>.

preparation, stating that “advanc[ed] planning is the key to effective emergency response and the recovery of museum and archival collections.”²⁰¹

The rationale behind the NPS statement is that advanced planning can prevent a hazard from becoming a disaster or at least mitigate the potential damage.²⁰² In order to mitigate such risk to the collections, the NPS publications suggest that the institutions conduct a comprehensive risk assessment.²⁰³ As other organizations have stated, the research and surveys conducted in such an assessment allow the heritage professionals to know the types of disasters most likely to affect the institution, as well as develop a fuller understanding of the nature of the museum’s collections through the condition surveys and material identification.²⁰⁴ This information can therefore enable the planning team to make informed decisions when developing the disaster plan.

The NPS guidelines also suggest that museums look to other institutions when developing their plans, as the information a museum gathers while researching disaster preparedness may also aid in other institutions through cross-institutional knowledge exchange.²⁰⁵ While museums should develop their own distinct disaster risk plans, established plans can offer a starting point as reference material on similar challenges and threats to collections faced by cultural

²⁰¹ National Park Service, “Chapter 10: Emergency Planning,” in *The Museum Handbook: Part 1 Museum Collections*, NPS, Washington DC (2000) accessed August 2014, <http://www.nps.gov/museum/publications/MHI/CHAP10A-B.pdf>

²⁰² *ibid.*

²⁰³ NPS, “Be Prepared: Develop a Museum Emergency Operations Plan,” *Conserve O Gram*, 21:9 (September 2005): 1..

²⁰⁴ Keene, “Collections Condition,” 398-399.

²⁰⁵ NPS, “Be Prepared: Develop a Museum Emergency Operations Plan,” *Conserve O Gram*, 21:9 (September 2005): 2.

institutions. This exchange of information helps to share and build on existing knowledge, while keeping others apprised of the standards established at similar institutions and fostering communication between common agencies.

Communications should also be established between the different actors within an institution.²⁰⁶ This is a recommendation echoed in other guidelines, as the plan is only effective if the museum is informed. The plan should be easily accessible by all staff members for reference, whether located on a server or in a file. The staff members should also have some prior knowledge of the procedures within the plan so that they may readily respond when faced with an emergency situation. This can be accomplished through drills or training courses.²⁰⁷ The simulation can give the staff members experience on how to act in different scenarios, as well as confidence to make informed decisions. Coordination efforts can be fine-tuned during such drills, thus enabling the institution to create an effective hierarchy of communication.

Disaster risk management plans are complex documents, with multiple steps and procedures addressing separate hazards and vulnerabilities. The plan should outline steps from the preparation phase through salvage, as well as list potential outside consultants and suppliers for additional resources.²⁰⁸ Though all this information is included in the plan, each disaster or emergency has the potential to be unique and have unexpected factors. For this reason the National Park Service

²⁰⁶ NPS, "Chapter 10: Emergency Planning," *The Museum Handbook*.

²⁰⁷ NPS, "Chapter 10: Emergency Planning," *The Museum Handbook*.

²⁰⁸ Hunter, "Museum Disaster," 158-159.

Museum Handbook suggests that institutions “keep [the] plan simple, flexible, and based upon existing museum routines so as to make it easy to implement.”²⁰⁹

C. American Alliance of Museums

The American Alliance of Museums (AAM) is a non-profit association that works to develop standards of practice, research, and advocate for museum professionals across the United States.²¹⁰ As part of this mission, the AAM has published a reference guideline entitled “Developing a Disaster Preparedness/ Emergency Response Plan.” The guide provides a brief overview of factors for museums to consider when developing a disaster risk plan, and includes common themes seen in the previously discussed guidelines.

As with other organizations, the AAM guidelines emphasize the need for an institution to create a unique plan for their particular risks and vulnerabilities. These particular risks can be identified through a risk assessment of the institution. This risk assessment should include everything from the structure of the building housing the collection to the collection itself.

The AAM also suggests that museums delegate responsibility for implementation of the risk plan.²¹¹ This will give all the responders particular tasks to focus on and create a system of order within an otherwise chaotic situation during an emergency. With delegation of responsibility a hierarchy of command is

²⁰⁹ NPS, “Chapter 10: Emergency Planning,” *The Museum Handbook*.

²¹⁰ “About Us,” American Alliance of Museums, accessed August 2014, <http://www.aam-us.org/about-us>.

²¹¹ American Alliance of Museums, *Developing a Disaster Preparedness/ Emergency Response Plan*, (Washington DC: AAM, 2012), 6.

established, reducing the potential of conflicting orders and giving outside agencies a contact person, as well as an overall coordinator of operations. Delegation also increases the chances that the plan will be read by more than the development team, since everyone will have to be informed of their duty during an emergency situation.

When developing a disaster risk management plan it is important that the committee include plans for both people within the institution and the objects in the collections.²¹² An institution's first responsibility is to the safety of both visitors and staff members, and once they are safe the objects can be secured. This is a guideline repeatedly found in other disaster plan development forums from UNESCO to FEMA, though both human lives and cultural heritage are deemed irreplaceable.²¹³ These directives can be carried out through the developed steps from preparedness planning to recovery operations.

The disaster plan guidelines from United States organizations and government agencies contain some differences from those found on the international level concerning specifics in steps and resources, but they also share similar themes. The guidelines found on both levels address the importance of the dissemination of knowledge on disaster risk management, as well as create awareness programs to serve this goal. They also emphasize the importance of communication both before and after a disaster. These common recommendations

²¹² *ibid.*

²¹³ Dorge and Jones, ed., *Building an Emergency Plan*, 47.

therefore can be seen as vital elements in the development of an institution's disaster risk management plan.

Chapter 6: Institutional Guidelines for Disaster Risk Management

International and national guidelines on disaster risk management planning provide recommendations for museums and cultural institutions in the development of institutional disaster risk management plans. As each collection is unique, so is each institution's plan. Below are two case studies of disaster risk management planning guides from cultural institutions. The discussion of these case studies, through the comparison of elements were used in their own disaster risk plan recommendations with those previously discussed, can help to formulate essential strategic elements for the development and implementation of disaster risk management plans in cultural heritage institutions.

A. Museum of Modern Art

The Museum of Modern Art in New York City has a vast collection of paintings, 3-dimensional objects, photography, and paper-based works. Located in Midtown Manhattan, the MOMA is in an area not usually affected by devastating natural disasters, but on October 29, 2012, the high winds and strong storm surges of Hurricane Sandy hit the New York metropolitan area. Hurricane Sandy was a tropical system in the Atlantic ocean that moved up the eastern seaboard, and though it had weakened to a "post-tropical cyclone" when it made landfall in New Jersey, it caused massive storm surges that resulted in severe flooding along the

New Jersey and New York coastlines.²¹⁴ The city of New York was not spared this flooding, with the most severe flooding seen in areas surrounding the bay, such as Lower Manhattan.²¹⁵ The flooding from this storm caused damage to property, including cultural heritage as the unfinished (at that time) 9/11 Museum experienced heavy flooding on the main floor²¹⁶, and both the Statue of Liberty Island and Ellis Island were closed for repairs.²¹⁷ It was not just national landmarks that were affected by Hurricane Sandy, but also smaller cultural heritage non-profits, art galleries, and private collections sustained significant damage.²¹⁸ Immediately following the storm cultural heritage relief groups, such as the Cultural Recovery Center in Brooklyn, sponsored by the Foundation of the American Institute for Conservation of Historic and Artistic Works (FAIC), responded to this damage.²¹⁹ These relief efforts spawned much response with cultural heritage organizations through active salvage operations and publication of information.

Though there is no public mention of damage to the MOMA's extensive collection, in response to the disaster, the following month the institution made public a document on response procedures for collection material. This section of a

²¹⁴ National Hurricane Center, *Tropical Cyclone Report: Hurricane Sandy (AL182012) 22-29 October 2012*, by Eric S. Blake, et al., (Miami: National Hurricane Center, 12 February 2013), 1.

http://www.nhc.noaa.gov/data/tcr/AL182012_Sandy.pdf

²¹⁵ Matthew Bloch, et al., "Survey the Destruction Caused By Hurricane Sandy," *New York Times*, November 21, 2012, accessed August 2014, <http://www.nytimes.com/newsgraphics/2012/1120-sandy/survey-of-the-flooding-in-new-york-after-the-hurricane.html>.

²¹⁶ David W. Dunlap, "Unfinished 9/11 Museum Is Flooded," *New York Times*, November 2, 2012, accessed December 2014, http://cityroom.blogs.nytimes.com/2012/11/02/unfinished-911-museum-is-flooded/?_r=0

²¹⁷ "Hurricane Sandy Recovery," National Park Service, accessed August 2014, <http://www.nps.gov/stli/after-hurricane-sandy.htm>.

²¹⁸ "FAIC Responds to Cultural Disasters," AIC, accessed August 2014, <http://www.conservation-us.org/docs/default-source/resource-center/aic-cert-and-cultural-recovery-center-update.pdf?sfvrsn=0>

²¹⁹ *ibid.*

disaster risk plan, entitled “Immediate Response for Collections,” outlines steps to take when collection material, both in storage and on display, is threatened by floodwaters. The plan put forth by MOMA covers response and recovery procedures and splits the guidelines by material type (paintings, objects, paper). As part of this response strategy, the plan outlines specific handling instructions for all such material, as well as steps of conditioning and prioritizing objects during salvage operations.²²⁰ These steps show careful research on the effects of water damage on each material, and possible emergency stabilization treatments.²²¹ This is consistent with the theme of dissemination of knowledge found throughout the international and national disaster risk management guidelines. The inclusion of such information helps the responders make informed decisions and therefore preserve the damaged objects.

The MOMA guideline also consists of instructions for immediate response with contact information for certain vendors and supplies, such as freezing equipment for damp books.²²² These steps follow the recommendations found in both the ICOM and NPS guidelines, where both organizations promote core knowledge of the collection that extends from having adequate supplies on hand for potential relief efforts to providing the contact information of those who can provide such services.²²³ The inclusion of the emergency contact list also promotes the theme of communication.

²²⁰ The Museum of Modern Art, *Immediate Response for Collections*, (New York, November 2012) 5-10.

²²¹ MOMA, *Immediate Response*, 10.

²²² MOMA, *Immediate Response*, 5.

²²³ Hunter, “Museum Disaster,” 158-159.

The MOMA disaster response plan, though brief, is specific in the information given to recover and salvage water-damaged material. Though it includes specific steps in treating and handling such objects, it acknowledges that each disaster is unique and therefore the methods employed for recovery may have to be altered.²²⁴ It is for this reason that the disaster plans should be seen as guidelines, allowing for flexibility to conform to each situation, while keeping with the ultimate goal of safeguarding cultural heritage.

B. Conservation Center for Art and Historic Artifacts

The Conservation Center for Art and Historic Artifacts (CCAHA) is a non-profit conservation center located in Philadelphia, PA. CCAHA boasts a conservation laboratory that specializes in works on paper while serving private clientele, cultural institutions, and other heritage organizations.²²⁵ Founded in 1977, the center's mission is to "provide expertise and leadership in the preservation of the world's cultural heritage."²²⁶ In keeping with this mission, CCAHA offers their services as a consultant to various custodians of cultural heritage that had seen damage in emergency situations. To support this part of their mission, CCAHA compiled a disaster resource guide called the *Mid-Atlantic Resource Guide for Disaster Preparedness* in 2013.²²⁷

²²⁴ MOMA, Immediate Response, 5.

²²⁵ CCAHA, *Mid-Atlantic Resource Guide for Disaster Preparedness* (Philadelphia: January 2013), i.

²²⁶ "About," CCAHA, accessed August 2014, <http://www.ccaha.org/about>.

²²⁷ CCAHA, *Mid-Atlantic*, 1.

The guide put out by CCAHA, like the MOMA, was made to assist other area institutions in the development of their disaster risk management plans. This guideline focuses on the creation of an “Emergency Telephone List” consisting of points of contact for service providers, suppliers, and equipment. The guide divides the list of contact information based on the type of supply or resource offered, providing contact information and a short description of the relevant services the company or organizations offers. This detailed list is in keeping with the recommendation that cultural institutions incorporate a list of emergency contacts and supplies as part of their disaster risk plan, as stated in the *Museum Handbook* and *Conserve O Gram* of the National Park Service.²²⁸ Having such a list handy allows staff members to respond to the disaster as quickly as possible, saving time and safeguarding their treasures.

The CCAHA guide also recommends that cultural institutions keep a copy of their key collection information, disaster risk plan, and a portion of their supplies off-site.²²⁹ Having the supplies and relevant information collected for the disaster risk plan is only helpful if they are accessible. If the disaster strikes the institution, and prevents access or damages the area where the equipment is stored, the gathered supplies will be rendered unusable. By having a secondary holding site, the response team can begin relief efforts with little delay, as well as having the access to their compiled emergency contact list for further assistance if needed.

²²⁸ NPS, “Chapter 10: Emergency Planning,” *The Museum Handbook*.

NPS, “Be Prepared: Develop a Museum Emergency Operations Plan,” *Conserve O Gram*.

²²⁹ CCAHA, Mid-Atlantic, 1.

The CCAHA guideline provides a more detailed look into one aspect of preparing a disaster risk plan. This resource guide was published to assist cultural heritage institutions and promote the efforts of such centers in the preparation for emergency or disaster situations through careful planning.

The MOMA and CCAHA guidelines focus on the preparedness and response aspects of disaster management planning. Preparedness is one of the most important aspects of disaster risk management planning, for it can greatly reduce the extent of potential damage done to collection materials in a disaster. In some cases a disaster can strike at such an extreme scale that the only viable planning outlet is for the recovery efforts. For example, in the terrorist attacks of September 11, 2001, and the subsequent collapse of the World Trade Center buildings, in addition to the loss of life, thousands of historical documents and works of art were destroyed. A large tapestry by Spanish artist Joan Miro, a Picasso painting, and thousands of photo negatives from the Kennedy administration are only a few of the objects lost.²³⁰ It is the objects that survived the attacks that became the focus of the recovery efforts. Among the most well known pieces to be recovered were some of Rodin sculptures from the art gallery of Cantor Fitzgerald. As with other phases of disaster management planning, creating awareness amongst those working at the

²³⁰ Cristian Salazar and Randy Herschaft, "Mystery Surrounds Loss of records, Art on 9/11," *Associated Press/Yahoo News*, August 31, 2011, accessed <http://news.yahoo.com/mystery-surrounds-loss-records-art-9-11-164719650.html>.

Lee Rosenbaum, "Restoring the Ruins," *Wall Street Journal*, June 24, 2014, accessed <http://www.wsj.com/articles/museum-the-national-september-11-memorial-and-museum-restoring-the-ruins-1403643192>.

disaster site would be essential for salvaging any objects. Most of the workers clearing out the rubble would not have an arts or preservation background, and could inadvertently discard an object of cultural significance. Taking this example, in a future disaster event, it is important that a disaster risk management plan is already in place for salvage operations of cultural materials from historic buildings, historic sites, museums, and other cultural institutions.

Whichever step of the disaster risk management strategy ends up taking precedence during a disaster situation, it is the planning and preparation done beforehand that can help save collection material. The preparedness steps taken before a disaster help to create an institutional-wide awareness of the plan and put in place preventative measures. Having plans in place for steps taken during a disaster and for the recovery efforts help to streamline the entire process, thus avoiding mass confusion. The guidelines from MOMA and CCAHA were created to help institutions create and develop their own disaster risk management plans, essential in safeguarding the cultural heritage within a cultural institution.

Conclusion

Disaster risk management for cultural heritage institutions has grown greatly in the past century, and with the destruction seen during World War II and the 1966 Florence Floods to the more recent events of the Haiti Earthquake in 2010 and Hurricane Sandy in 2012 there can be no question on the need for the field. The publication of international and national guidelines on preparation and response for such events greatly aids cultural heritage institutions in the development and implementation of disaster risk plans. These international and national recommendations range from site or institutional specific to more general guidelines that can be applied to both moveable and immovable cultural heritage. Regardless of the specification, the thoughts and ideas behind these guidelines can be applied to museum collections, as both sites and museums share the same threats and risks. When discussing these guidelines three themes become apparent, and it is these themes that all institutions should utilize when developing their disaster risk plans.

Though there are many aspects of disaster risk management plans to consider, one of the most important is the uniqueness of the plan; each plan should be specific to each institution. Though it may be easy, and seem faster, for an institution to use existing templates or to copy a plan from another museum, in the end this may not be the most effective way of mitigating threats to collection materials. The risks and hazards that an institution faces change by location – what one museum may prioritize, may be an inconsequential hazard at another, as the

physical material of the collection and the probability of a hazard occurring are all factors that must be considered. An institutional specific plan is important in the development of effective safeguarding strategies. Online templates, such as those prepared by the Northeast Document Conservation Center, may provide a customized plan, but the nuances of the museum's management and the dynamics of the staff will not translate into a computer program.²³¹ Part of the process of developing a disaster risk plan entails the museum staff gaining knowledge of the museum's collection and facilities. By placing core data into a template, the staff has lost the research aspect of the plan development and the resulting knowledge gained. As research and training can increase the effectiveness of an institution's response, reducing time spent on this step can be detrimental to the institution's disaster risk management.²³² As stated in the National Park Service's *Conserve O Gram*, the use of other institution's plans or templates can be a resource, but it is important that museum's develop distinctive disaster risk plans for their own unique collections.²³³

Another theme echoed throughout the guidelines is the importance of communication between those working within the cultural institution, between the institution and the first responders, and between the museum and other agencies that may be responding to the disaster. All of the disaster risk management guidelines discussed above emphasized the importance of establishing good

²³¹ "The Online Disaster-Planning Tool for Cultural and Civic Institutions," Northeast Document Conservation Center (NEDCC), accessed August 2014, <http://www.dplan.org/>.

²³² Watkins, "Developing Statewide," 171.

²³³ NPS, "Be Prepared: Develop a Museum Emergency Operations Plan," *Conserve O Gram*, 2.

communication channels. In the *Olympia Protocol*, UNESCO cited communication channels as a method of streamlining the response and bringing a measure of order to a chaotic situation.²³⁴ This is done through a “well-integrated team”²³⁵ effort between the emergency responders and heritage professionals. With open and established communication channels, the teams can work with shared resources and without interfering with each other’s primary goals.

As it is important for the museum staff responders to work with the other responding agencies, it is also important for an organized method of communication within the institution to be in place.²³⁶ ICOM, NPS, and others have emphasized that staff members stay informed on the steps and procedures of the institution’s disaster risk plan. Having a hierarchical system of reporting and delegating tasks during a disaster can create order in the efforts to safeguard the collections. This includes creating a list the contacts for reporting an emergency and those to contact for consultation during recovery efforts, as anyone can be called upon to act when faced with a disaster situation. Communication is an important theme in the disaster risk management through coordination, response, and preparation.

The third theme echoed in the guidelines is awareness and advocacy. More prevalent in the international guidelines, it is nonetheless an important part of institutional planning as well. Building awareness of the disaster risk management within the institution goes in part with the theme of communication. ICOM recommended that everyone in the museum be aware of the procedures of the plan,

²³⁴ UNESCO, *Olympia Protocol*, 11-12.

²³⁵ ICOM, *Guidelines*, 2.

²³⁶ Dorge and Jones, ed., *Building an Emergency Plan*, 69.

as anyone could be caught in a disaster situation.²³⁷ While it is important that all staff members read the disaster management plan, there should be an effort to inform anyone who interacts with the collection of the disaster plan as an effort in mitigation. This could as simple as giving a quick handling tutorial to visiting scholars. All too often objects in museums are thought only to belong to the institution which houses them, but they are objects of cultural heritage and therefore belong to the community as a whole. Creating awareness of disaster risk management for cultural heritage can help foster the desire to save the collection within the community²³⁸, whether by earmarking the use of resources in case of a disaster or through the raising of funds for a small institution's mitigation efforts. Awareness and advocacy have always been a part of the field and can be an effective tool to help create protective environments for collection materials.

The entire disaster risk management planning process works towards safeguarding collections. Though no step has greater importance over another, time spent in preparing for a disaster can save precious time in the recovery and response phases and help mitigate the damage done by the hazard. Brian Dovey, former chairman of the International Committee on Museum Security, stated, "Forethought and planning can prevent an emergency becoming a disaster and minimize the injury and damage to people and collections."²³⁹ Collections can face a wide variety of threats, from natural to manmade hazards. Preparation and

²³⁷ ICOM, *Guidelines*, 3.

²³⁸ Daniel Bluestone, "Challenges for Heritage Conservation and the Role of Research on *Values*. In *Values and Heritage Conservation*, ed. Erica Avrami, et al., (Los Angeles: Getty Conservation Institute, 2000), 66.

²³⁹ ICOM, *Guidelines*, 1.

mitigation efforts toward potential disasters and threats to collections can greatly contribute to the efforts to safeguard collections. Through advanced planning, museum professionals can save collections from potential catastrophic damage and is essential in the ongoing care and management of collection materials.

Disaster risk management planning is an important aspect for the ongoing care of collections. The development of a disaster risk management plan is part of the preventative conservation measures that can be undertaken by museum staff. With effective disaster risk management plans in place, collection materials stand a greater chance at surviving an unexpected threat or situation. The preparedness, mitigation, response and recovery processes developed through careful research, established communication channels, and awareness with everyone who interacts with the collections can save precious time and resources for museum institutions. This allows the institutions to continue their mission as centers offering a reflection of the world's heritage and culture.

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