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CLIMATE CHANGE AND CULTURAL HERITAGE:
DISASTER MANAGEMENT UNDER THE TRUMP ADMINISTRATION

By

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ABSTRACT OF THESIS
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Natural hazards such as flooding, hurricanes, and wildfires threaten cultural heritage throughout the United States. Although disaster management for cultural heritage has improved over the last few decades, the threat of climate change increases the frequency and severity of these hazards, requiring unique planning and mitigation actions. While states and local municipalities would typically look to the federal government for financial resources and technical assistance to develop these planning tools, the Trump Administration denies the existence of human-induced climate change. Therefore, state and local governments are solely responsible to prepare their communities as well as their valuable cultural heritage and historic resources for the impacts of climate change.

This thesis seeks to demonstrate the importance of integrating climate change planning into state and local hazard mitigation plans for historic resources. By reviewing changes made by the Trump Administration to climate change planning and their likely impacts on cultural heritage, this thesis establishes the need for local climate change planning efforts to start immediately in light of this unpredictable change. The research conducted for this study involved assessments of existing state and local hazard mitigation plans in Florida, Pennsylvania, and Annapolis, Maryland, to determine best practices for integrating climate change planning into disaster management for historic resources. By identifying best practices, this thesis aims to illustrate how state and local level disaster management can prepare for the effects of climate change on historic resources despite the fact that the federal administration denies its existence.

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Chapter 1: Introduction

Cultural heritage sites and landscapes in the United States are threatened by the impacts of natural hazards and 21st century climate change patterns. Of most concern are extreme weather events such as severe floods, hurricanes, tsunamis, and wildfires. In the United States, flooding is a significant risk to cultural heritage as floods are one of the most common natural hazards in the country; they can occur anywhere during any season.¹ Climate change causes atmospheric moisture changes which alter rain-fall patterns² and sea-level rise increases the risk of flooding and the threat of severe storm surge in coastal areas.³ Hurricanes and resultant floods pose a great risk to cultural heritage due to human's historic tendency to settle and build near waterways and vulnerable coastlines.⁴ Recent North Atlantic cyclonic storms such as Hurricane Katrina (2005) and Hurricane Sandy (2012) as well as the 2017 Hurricane Season storms Harvey, Jose, Irma, and Maria⁵ affected the built environment of the cities they impacted as well as the people who have cultural, emotional, spiritual, and historical links to these communities and landscapes.⁶

Individual states, particularly those located along coastlines or tidal rivers, are on the frontlines for disaster preparedness and recovery of cultural heritage in the United States. However, as a result of the intensity and severity of damage from Hurricanes Katrina (2005) and

¹ United States Department of Homeland Security, FEMA, "The National Flood Insurance Program," FEMA The National Flood Insurance Program, February 5, 2018, <https://www.fema.gov/national-flood-insurance-program>.

² May Cassar, "Sustainable Heritage: Challenges and Strategies for the Twenty-First Century, APT Bulletin," *Journal of Preservation Technology* 40, no. 1 (2009): 6.

³ "The Relationship Between Hurricanes and Climate Change," *The New York Times*, sec. U.S., accessed January 21, 2018, <https://www.nytimes.com/2017/08/25/us/hurricane-harvey-climate-change-texas.html>.

⁴ Douglas Appler and Andrew Rumbach, "Building Community Resilience Through Historic Preservation," *Journal of the American Planning Association* 82, no. 2 (Spring 2016): 97, <https://doi.org/10.1080/01944363.2015.1123640>.

⁵ At the time of writing, the effects of the 2017 and 2018 hurricane seasons are still under evaluation, the effects of these storms will not be explored as in depth in this thesis as Hurricanes Katrina and Sandy.

⁶ Diane C. Bates, *Superstorm Sandy: The Inevitable Destruction and Reconstruction of the Jersey Shore* (New Brunswick, New Jersey: Rutgers University Press, 2015), 22.

Sandy (2012), state resources were exhausted and federal assistance was required. Major disaster events such as these highlight the need for disaster planning and mitigation policy changes. The unprecedented damage caused by Hurricane Sandy in 2012 resulted in dramatic policy changes by the Obama Administration regarding planning for climate change.⁷ Executive Orders such as 13653, passed in November of 2013, focused on new strategies to improve the United States' resilience to the effects of climate change.⁸ While climate change has led to extreme weather events and rising sea levels, the Trump Administration is reversing the federal policies necessary to plan for these environmental changes and assist local communities in the protection of homes, infrastructure, and local heritage.

This thesis aims to establish why state and local-level hazard mitigation planning for historic resources is essential under the Trump Administration. In the years immediately following Hurricane Sandy, planning for the effects of climate change was a top priority at the federal level;⁹ however, integrating climate change planning into hazard mitigation planning was nascent under the Obama Administration. It was only in 2015 that the Federal Emergency Management Agency (FEMA) updated their State Mitigation Plan review guide to include planning for future hazards impacted by climate change.¹⁰ Moreover, planning for climate change is no longer a top priority at the federal level. The Trump Administration announced in June of

⁷ Exec. Order. No. 13632, 77 Fed. Reg. 74341 (December 7, 2012), <https://obamawhitehouse.archives.gov/the-press-office/2012/12/07/executive-order-establishing-hurricane-sandy-rebuilding-task-force>; Exec. Order. No. 13653, 78 Fed. Reg. 66817 (November 1, 2013), <https://obamawhitehouse.archives.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change>; “Obama’s FEMA Chief: To Rebuild after Hurricanes, Let’s Talk Climate Change,” Grist (blog), October 4, 2017, <https://grist.org/article/obamas-fema-chief-to-rebuild-after-hurricanes-lets-talk-climate-change/>.

⁸ Exec. Order. No. 13653, 78 Fed. Reg. 66817.

⁹ “In Ongoing Response to Hurricane Sandy, We Must Remain Focused on Climate Change’s Long-Term Impacts,” October 29, 2015, <https://obamawhitehouse.archives.gov/blog/2015/10/29/ongoing-response-hurricane-sandy-we-must-remain-focused-climate-changes-long-term>.

¹⁰ United States. Department of the Homeland Security. Federal Emergency Management Agency, “State Mitigation Plan Review Guide (Revised March 2015),” accessed February 22, 2018, 1, https://www.fema.gov/media-library-data/1425915308555-aba3a873bc5f1140f7320d1ebcbd18c6/State_Mitigation_Plan_Review_Guide_2015.pdf.

2017 that the United States would withdraw from the Paris Climate Accord¹¹ and in his 2018 budget proposal, President Trump also proposed eliminating funding for FEMA's National Flood Insurance Program's (NFIP) Flood Hazard Mapping Program.¹² Therefore, this thesis will address policy changes made by the current administration that can adversely affect planning for climate change hazards as well as assessing how well climate change planning is integrated into state and local hazard mitigation plans for historic resources. Utilizing a content analysis of existing hazard mitigation plans to illustrate how state and local level disaster management for historic resources compensate for changes at the federal level, this thesis attempts to show how preservationists can locally prepare for the effects of climate change on cultural heritage in the United States despite the fact that current administration denies its existence.

The Need for Disaster Planning

Several topical areas contribute to the foundation of this thesis analysis, including the importance of cultural heritage to the recovery of a community. Natural hazards and the disaster events they cause often lead to a disruption to the course of everyday life and cultural heritage can generate a sense of place that helps communities cope in these times of instability.¹³ This sense of place contributes to a community's mental health and well-being while recovery efforts are ongoing.¹⁴ Cultural heritage can be a key component of a community's resilience and

¹¹"President Trump Announces U.S. Withdrawal From the Paris Climate Accord," June 1, 2017, <https://www.whitehouse.gov/articles/president-trump-announces-u-s-withdrawal-paris-climate-accord/>.

¹² United States Office of Management and Budget, "America First: A Budget Blueprint to Make America Great Again," 24, accessed October 3, 2017, https://www.whitehouse.gov/wp-content/uploads/2017/11/2018_blueprint.pdf.

¹³ Dirk R. Spennemann and Kristy Graham, "The Importance of Heritage Preservation in Natural Disaster Situations," *International Journal of Risk Assessment and Management* 7, no. 6/7 (2007): 996, <https://doi.org/10.1504/ijram.2007.014670>.

¹⁴ Spennemann and Graham, "The Importance of Heritage Preservation," 997.

recovery after a disaster event. It represents a place of memory within the community and gives people a sense of stability in otherwise uncertain times.¹⁵

Although cultural heritage contributes to the emotional resiliency of a community post-disaster, the recovery of cultural heritage has not been top priority in initial disaster response in the United States throughout 20th and 21st centuries. Disaster response is devoted to the short-term recovery of disaster victims and restoration of essential infrastructure to address immediate threats and stabilize the community after a disaster event.¹⁶ Often disaster management for cultural heritage is reactive and concern for damage to heritage sites comes in the late stages of recovery efforts by shoring up historic buildings and sites.¹⁷ Although some preservationists have advocated including historic properties in the top stages of disaster response and recovery, state and local historic preservationists do not perceive natural hazards as the number one threat to historic resources. State and local historic resource planning tends to be concerned with demolition and new development.¹⁸ Even after Hurricane Sandy, Jersey Shore residents perceived development as a greater threat to their historic resources than future storm damage. Year-round residents did not have the financial resources to repair their historic homes from storm damage and affluent second homeowners demanded new homes that were more cost-effective to maintain. This has often resulted in the demolition of historic homes along the New Jersey coast.¹⁹

¹⁵ Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 93.

¹⁶ United States. Department of the Homeland Security. Federal Emergency Management Agency. "National Disaster Recovery Framework," June 2016. <https://www.fema.gov/pdf/recoveryframework/ndrf.pdf>. 44.

¹⁷ Spennemann and Graham, "The Importance of Heritage Preservation," 996.

¹⁸ Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 99.

¹⁹ Charles Hovanic, "Stronger than the Storm? Promoting the Post-Sandy Resilience of Historic Resources in New Jersey's Coastal Communities" (Columbia University, 2016), 109, https://academiccommons.columbia.edu/download/fedora_content/download/ac:200199/content/HovanicCharles_GSAPHP_2016_Thesis.pdf.

Pre-disaster mitigation and planning are therefore necessary to protect cultural heritage during natural disasters in the United States. Federal legislation such as the Robert T. Stafford Act (Stafford Act) (1988) and the Disaster Mitigation Act (DMA) (2000), as well as the National Park Services' (NPS) Preservation Planning Program, requires and encourages that planning and mitigation are executed at the state level through tools such as State Hazard Mitigation Plans (SHMPs) and State Historic Preservation Plans (SHPPs).²⁰ However useful these plans may be, there remains a lack of integration of cultural heritage in disaster management at some state levels. Only half of the individual SHPPs nationwide include any mention of disaster or emergency planning or an existing policy connecting natural hazards and historic preservation. In addition, only 13 SHMPs mention the protection of historic resources in their mitigation strategy.²¹

A Brief Background of Historic Preservation and Disaster Management in the United States

The second topical area that contributes to this study is the evolution of the relationship between disaster management and historic preservation, from one of discord to that of cooperation. In the United States, historic preservation policy began with the Antiquities Act (AA) of 1906; this legislation protects archaeological sites on public lands as well as historic, cultural, commemorative, and scientific resources from unauthorized excavation, looting, and vandalism by charging violators with fines and imprisonment.²² Today, these offenses carry felony charges under the Archaeological Resources Protection Act (ARPA) of 1979.²³ The AA also authorizes the President to designate National Monuments to protect landmarks and

²⁰ Hovanic, 94.

²¹ Hovanic, 95-96.

²² "The Antiquities Act of 1906 - Legislative and Congressional Affairs (U.S. National Park Service)," accessed February 11, 2018, <https://www.nps.gov/subjects/legal/the-antiquities-act-of-1906.htm>.

²³ "NPS Archeology Program: The Archaeological Resources Protection Act of 1979 (ARPA)," accessed September 1, 2018, <https://www.nps.gov/archeology/tools/laws/arpa.htm>.

structures of historic or scientific interest.²⁴ However, other than setting aside public land, it was not expressly concerned with historic preservation as we know it today or disaster mitigation. It was not until the National Historic Preservation Act (NHPA) in 1966 (now amended through December 16, 2016)²⁵ and the National Environmental Policy Act (NEPA) in 1969 that specific review procedures were implemented for federal agencies regarding their undertakings impacting historic properties. Along with creating the National Register of Historic Places (NRHP), the NHPA also implemented the Section 106 review process. Section 106 mandates that any federal agency may not proceed with federally funded and permitted projects until the agency considers the effects their undertaking would have on all sites listed on, or eligible for listing on, the NRHP.²⁶ The NEPA uses similar review procedures for all “major federal actions significantly affecting the quality of the human environment” which include “historic, cultural, and natural aspects of our cultural heritage”.²⁷

It was with the Stafford Act (1988) that the NHPA and the NEPA cultural resource review process touched upon emergency response following natural disaster events. Although the Stafford Act (1988) appointed FEMA as the federal agency to deal with disaster response,²⁸ states and local municipalities have the main responsibility to plan and manage a community’s recovery. However, large-scale disaster events such as Hurricanes Katrina and Sandy exhaust state and local resources causing communities to turn to the federal government for financial and technical support. The Stafford Act provides the legal authority for the federal government to

²⁴ “American Antiquities Act of 1906 - Legislative and Congressional Affairs.”

²⁵ United States, “The National Historic Preservation Act As Amended through December 16, 2016 and Codified in Title 54 of the United States Code”, Pub. L. No. 89–665, 54 (2016). <https://www.achp.gov/sites/default/files/2018-06/nhpa.pdf>.

²⁶ Elizabeth Tuner, “Rebuilding from Ruins: The Role of Historic Preservation in the Wake of Disaster,” *University of Florida Journal of Law and Public Policy* 25, no. 2 (August 2014): 117.

²⁷ Tuner, “Rebuilding from Ruins: The Role of Historic Preservation in the Wake of Disaster,” 118.

²⁸ Tuner, “Rebuilding from Ruins: The Role of Historic Preservation in the Wake of Disaster,” 119.

provide this support; a governor of an impacted state must first respond to the disaster event by executing the state emergency response plan. If the event exceeds the state's ability to respond financially, the governor must then submit a written request for a presidential disaster declaration that enables access to federal funds and FEMA support appropriated by Congress.²⁹ As a federal agency, FEMA follows the NHPA and NEPA review procedures for historic properties. Although historically FEMA did not have the resources nor the staff to assist in the survey assessment of cultural structures and sites, leaving individual states with the responsibility to mitigate damage to their community's historic properties.³⁰

Within the late 20th century, major disaster events highlighted the need for FEMA's informed involvement in historic preservation resulting in the implementation of new procedures and legislation. In the fall of 1989, Hurricane Hugo devastated the historic city of Charleston, South Carolina resulting in \$250 million in damage to approximately 3,500 of Charleston's historic buildings.³¹ At this point in time, FEMA did not have staff with historic preservation experience and the local community bore responsibility to ensure appropriate restorations of their historic properties. While some citizens called for a relaxation of historic preservation standards, Charleston's Mayor refused. The local Historic Charleston Foundation worked with qualified volunteers trained in architecture and historic preservation to help rebuild the city. In addition, the NPS provided staff with technical knowledge to assist property owners with repairs on their historic homes.³² While Charleston was a success story for local historic preservation, it also highlighted FEMA's lack of resources necessary to comply with NHPA and NEPA review

²⁹ "Emergency Authority and Immunity Toolkit," ASTHO, n.d., <http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and-Immunity-Toolkit/Robert-T--Stafford-Disaster-Relief-and-Emergency-Assistance-Act-Fact-Sheet/>.

³⁰ Stephanie J. Talbert, "The Golden Hour: The Role of Historic Preservation Law in the Immediate Aftermath of Disaster," *The Environmental Law Reporter* 36, no. 8 (August 2006): 10.

³¹ Tuner, "Rebuilding from Ruins: The Role of Historic Preservation in the Wake of Disaster," 127.

³² Talbert, "The Golden Hour: The Role of Historic Preservation Law in the Immediate Aftermath of Disaster," 11.

standards. Hurricane Hugo led FEMA to develop The Office of Environmental Planning and Historic Preservation (EHP) that currently utilizes state-specific programmatic agreements developed pre-disaster as a tool for disaster mitigation.³³

In times of a disaster declaration in the United States, the common law doctrine of “necessity” or “necessity defense” allows federal agencies such as FEMA to take actions during emergency situations that would otherwise be contrary to law, including federal review procedures.³⁴ The President’s Council on Environmental Quality (CEQ) under the NEPA and the Advisory Council on Historic Preservation (ACHP) under the NHPA have created provisions for emergency situations that waive the typical review process in line with the necessity doctrine when a disaster has been declared.³⁵ This allows FEMA to bypass the review process for federally funded projects during initial rescue operations; however, the ACHP also provides alternative options for addressing the Section 106 review during an emergency or disaster. The preferred method is developing state and tribal-specific programmatic agreements with FEMA to streamline the NHPA and NEPA review process during disaster recovery.³⁶ The Midwest Floods of 1993³⁷ led to the development of programmatic agreements; FEMA and individual State Historic Preservation Offices (SHPO) establish these agreements prior to a disaster and they are typically active for five years.³⁸ As climate change makes severe weather events more likely, FEMA’s role in historic property’s recovery post-disaster is essential to a state’s disaster management.

³³ Talbert, 6.

³⁴ Jomar Maldonado, “Environmental Reviews & Case Studies: Navigating the Emergency Provisions of Federal Environmental Planning Requirements,” *Environmental Practice* 12, no. 3 (2010): 238, <https://doi.org/10.1017/s146604661000030x>.

³⁵ Maldonado, “Environmental Reviews & Case Studies,” 238–39.

³⁶ Talbert, “The Golden Hour: The Role of Historic Preservation Law in the Immediate Aftermath of Disaster,” 7.

³⁷ David R. Godschalk, *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*. (Washington, D.C.: Island Press, 1999), 181.

³⁸ Talbert, “The Golden Hour: The Role of Historic Preservation Law in the Immediate Aftermath of Disaster,” 6.

After Hurricane Hugo in 1989, the next major disaster event that tested the NHPA review process was Hurricane Katrina. Hurricanes Katrina and Rita devastated the Gulf Coast region in the fall of 2005, resulting in over 1,500 deaths and \$108 billion in damage.³⁹ Most of the damage occurred in New Orleans, though unlike the response to Hurricane Hugo in Charleston, New Orleans' Mayor suspended the authority of the city's Historic District Landmarks Commission (HDLC). This resulted in unchecked demolitions of historic buildings without federal review.⁴⁰ FEMA was heavily criticized for the ineffectiveness of their Section 106 process during this disaster as the US Army Corps of Engineers (USACE) tore down 4,387 buildings in the year after Katrina.⁴¹ Historic houses and other culturally significant buildings were damaged and torn down, including the Naval Brigade Hall. An important structure to the history of jazz in New Orleans, the Naval Brigade Hall was marked unsafe and torn-down because building inspectors were unaware of its significance and that it merited preservation.⁴²

The most recent natural disaster event that can be evaluated for a lack of preparedness and collaboration between cultural heritage and disaster management professionals occurred on the east coast in 2012. Hurricane Sandy, the largest Atlantic Hurricane ever recorded at the time, made landfall southwest of Atlantic City, NJ on October 29, 2012. Heavy winds, rain, snow, and a tidal surge up to 13 feet high⁴³ caused \$65 billion in damage along the East Coast of the United

³⁹ Tuner, "Rebuilding from Ruins: The Role of Historic Preservation in the Wake of Disaster," 129.

⁴⁰ Stephen Verderber, "The Unbuilding of Historic Neighbourhoods in Post-Katrina New Orleans," *Journal of Urban Design* 14, no. 3 (2009): 258, <https://doi.org/10.1080/13574800903056465>.

⁴¹ Verderber, 274.

⁴² Barbara L. Allen, "Environmental Justice, Local Knowledge, and after-Disaster Planning in New Orleans," *Technology in Society* 29 (January 1, 2007): 153–59, <https://doi.org/10.1016/j.techsoc.2007.01.003>.

⁴³ United States. Department of the Interior, "Hurricane Sandy Disaster Relief Supplemental Appropriations Spending Plan Department of the Interior," May 6, 2013, 9, https://www.doi.gov/sites/doi.gov/files/migrated/news/pressreleases/upload/2013_05_06-Hurricane-Sandy-Plan-Sm.pdf.

States.⁴⁴ This included \$348 million in damage to National Parks and \$50 million in damage to Historic Resources listed or eligible for listing on the NRHP.⁴⁵ The most significant damage occurred in New York City and New Jersey⁴⁶ and impacted important federal cultural resources such as Liberty Island, Ellis Island, and the African Burial Ground National Monument⁴⁷ as well as state historic resources such as New Jersey's coastal Historic Districts and the Atlantic City Boardwalk.⁴⁸ The intense storm surge caused the most damage, flooding historic resources on the coast and many urban areas along the Hudson River such as the First Assembly of God Church in Bayonne and the Erie-Lackawanna Terminal in Hoboken.⁴⁹ Many of these properties were built before modern floodplain regulations and therefore were left vulnerable to flooding and severe storm surge.⁵⁰

The recovery from these disaster events indicate the need for adequate federal and state funding for disaster mitigation planning for historic resources. There is also a need for greater SHPO outreach and education with local governments and communities to emphasize hazard mitigation planning for historic resources. Disaster preparation in the Middle Atlantic states is essential with heritage resources identified in areas shown to be vulnerable to hurricanes and flooding as well as the current pattern of sea level rise and an increase in the frequency and severity of storms.

⁴⁴ "One Year after Sandy, 9 Devastating Facts," USA TODAY, accessed January 21, 2018, <https://www.usatoday.com/story/news/nation/2013/10/29/sandy-anniversary-facts-devastation/3305985/>.

⁴⁵ United States, "Hurricane Sandy Disaster Relief Supplemental Appropriations Spending Plan," 1 & 20.

⁴⁶ United States, "Hurricane Sandy Disaster Relief Supplemental Appropriations Spending Plan," 20.

⁴⁷ United States, "Hurricane Sandy Disaster Relief Supplemental Appropriations Spending Plan," 12 & 16.

⁴⁸ New Jersey Historic Preservation Office, "Action Plan Narrative for the Preservation, Stabilization, Rehabilitation, and Repair of Historic Properties" (New Jersey Department of Environmental Protection, December 20, 2013), attachment 2, http://www.nj.gov/dep/hpo/Index_HomePage_images_links/Hurricane%20Sandy/FINAL_APPLICATION_Action_Plan_122013.pdf.

⁴⁹ New Jersey Historic Preservation Office, "Action Plan Narrative", 3 & 2-2.

⁵⁰ FEMA P-942, "Mitigation Assessment Team Report: Hurricane Sandy in New Jersey and New York," 2013, 6–10.

Climate Change and the New Administration

The third topical area that contributes to this study is the threat of climate change and its impacts on the historic environment. As of 2017, a Category 1 storm such as Hurricane Sandy in the New York City region was a 1-in-100-year event. By the year 2080, sea level rise will increase these chances to a 1-in-35-year event,⁵¹ with the likely result that storms will cause even more damage to already vulnerable historic properties in the area. 2017 was the most expensive hurricane season in the United States with six storms reaching a category 3 or higher.⁵² Hurricanes Harvey, Irma, and Maria impacted Texas, Louisiana, Florida, Puerto Rico, and the US Virgin Islands causing approximately \$265 billion in damages.⁵³

President Trump's 2018 budget proposal outlines major cuts to federal programs involved in climate change research and cultural heritage management such as the Environmental Protection Agency (EPA), the Department of the Interior (DOI) and FEMA. Two weeks before Hurricane Harvey made landfall in August of 2017, President Trump signed an Executive Order⁵⁴ that rescinded a 2015 Obama-era Executive Order directing federal funds to reinforce public structures to withstand future hazards caused by climate change.⁵⁵ Despite an established body of scientific evidence on the existence of climate change and its effects, the current administration continues to refuse to plan for the potential negative effects of climate change. Trump's FY18

⁵¹ Douglas Fox, "What Would Happen If a Super Storm Hit New York?," *Popular Mechanics*, October 26, 2012, <http://www.popularmechanics.com/science/environment/natural-disasters/what-happens-when-a-super-storm-strikes-new-york-6323032>.

⁵² "Extremely Active 2017 Atlantic Hurricane Season Finally Ends | National Oceanic and Atmospheric Administration," accessed March 6, 2018, <http://www.noaa.gov/media-release/extremely-active-2017-atlantic-hurricane-season-finally-ends>.

⁵³ "Hurricanes and Tropical Storms - Annual 2017 | State of the Climate | National Centers for Environmental Information (NCEI)," accessed March 6, 2018, <https://www.ncdc.noaa.gov/sotc/tropical-cyclones/201713>.

⁵⁴ Exec. Order. No. 13807, 82 Fed. Reg. 40463 (August 15, 2017), <https://www.whitehouse.gov/the-press-office/2017/08/15/presidential-executive-order-establishing-discipline-and-accountability>.

⁵⁵ Exec. Order. No. 13690, 80 Fed. Reg. 6425 (January 30, 2015), <https://obamawhitehouse.archives.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and->.

proposed budget cuts included a 31% decrease to the EPA’s budget that cut climate change research and international climate change programs.⁵⁶ Additionally, the proposal reduced the DOI’s budget by 12% and eliminated programs such as the National Heritage Area program,⁵⁷ which supports historic and cultural resource preservation at sites throughout the country.⁵⁸ These budget cuts and executive orders have the possibility to undermine federal disaster planning, mitigation, and recovery efforts for historic resources in future natural disasters.⁵⁹

Preparing for the Unexpected

Although some natural hazards can occur unexpectedly, disaster events such as hurricanes and flooding typically come with some warning from the National Hurricane Center within NOAA.⁶⁰ Regardless of which type of hazard might hit a community, preparations can be made before a hazard occurs to help protect human lives and important cultural historic properties such as museums and historic sites. Many of the tools to prepare historic properties from the effects of natural hazards already exist within FEMA. Programmatic agreements allow for SHPOs and FEMA to work together to create a plan to streamline the Section 106 review process before a disaster event and fund the needed repairs to a historic structure during recovery

⁵⁶ United States Office of Management and Budget, “America First A Budget Blueprint to Make America Great Again,” 41–42.

⁵⁷ United States Office of Management and Budget, “America First,” 27.

⁵⁸ “Budget Proposal Threatens National Parks,” National Parks Conservation Association, accessed September 23, 2017, <https://www.npca.org/articles/1500-budget-proposal-threatens-national-parks>.

⁵⁹ “Trump Policies Could Undermine Post-Harvey Rebuilding,” NPR.org, accessed September 23, 2017, <http://www.npr.org/2017/08/29/547099667/trumps-proposed-budget-cuts-could-undermine-harvey-relief-efforts>.

⁶⁰ National Hurricane Center, “National Hurricane Center,” accessed October 16, 2018, <https://www.nhc.noaa.gov/>.

operations.⁶¹ The NHPA also introduced the SHPP as a planning tool to set general goals for the state's historic preservation community.

Disaster planning and mitigation begins at the state level in the United States, although major disasters sometimes require federal support for state recovery. The DMA requires that states have an emergency operation plan in place before a disaster event in order to qualify for federal assistance; these plans are essential to the protection and recovery of communities and cultural heritage after natural disasters. In the past, disaster management and historic preservation had not collaborated to protect cultural heritage from natural hazard threats. This has changed over time with the introduction of tools such as programmatic agreements that enhanced collaboration between the two fields in the early 1990's; however, integration remains varied at the state-level. Climate change patterns are contributing to conditions that are making natural hazards more frequent and severe, creating the need for better state and local-level disaster planning and mitigation before a disaster event to protect cultural heritage from unnecessary destruction and demolition.

Review of Literature

This thesis will focus on the need to integrate climate change planning into disaster management for historic resources under the Trump Administration. Studies worldwide have argued for better integration between disaster planning and historic preservation, focusing on the need for disaster mitigation and preparedness of historic resources before a hazard event leads to a disaster.⁶² The importance of cultural heritage and the need to protect it has emerged from

⁶¹ David R. Gardner, "The Federal Emergency Management Agency and Its Role in Historic Preservation," *APT Bulletin* 1, no. 49 (2004): 50, JSTOR Journals, EBSCOhost.

⁶² "Emergency Preparedness and Response - ICOM," accessed October 16, 2018, <https://icom.museum/en/activities/heritage-protection/emergency-preparedness-and-response/>; "Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and Their Settings from Loss in Disasters | PreventionWeb.Net," Preventionweb, accessed October 16, 2018,

scholarship in multiple fields including disaster management, historic preservation, mental health, and resilience management. The focus of this thesis draws from many topical areas including cultural heritage and historic preservation, disaster management, as well as climate change planning and legislation.

Study of Collaboration between the fields of Disaster Management and Cultural Heritage

Although disaster planning for cultural properties is essential to their protection, disaster planning and historic preservation practices were not always well integrated in the United States. Until recently, preservationists' primary concerns included the ordinary decay of historic sites and structures, with less attention dedicated to natural disaster planning and mitigation.⁶³ Earlier studies also noted a lack of communication and collaboration between disaster management and preservationists as a contributing factor to the poor integration of these fields.⁶⁴ Spennemann and Look outlined the tenuous relationship between FEMA and the NPS in late 1990's. Their work emphasized a lack of understanding of each other's goals, which led to inter-agency rivalry. Programmatic agreements and memorandum of agreements in place at the time, and still utilized today, helped contribute to a better relationship between the two agencies allowing for better disaster management of cultural heritage.⁶⁵

Although programmatic agreements allow for better collaboration between disaster managers and preservationists, in a more recent study, Spennemann and Graham argued how

<https://www.preventionweb.net/publications/view/41735>; "Sendai Framework for Disaster Risk Reduction - UNISDR," accessed October 16, 2018, <https://www.unisdr.org/we/coordinate/sendai-framework>; World Bank Group, *Promoting Disaster Resilient Cultural Heritage*, 2017, <http://documents.worldbank.org/curated/en/696061511882383371/pdf/121709-WP-P161985-PUBLIC-DisasterResilientCulturalHeritageKnowledgeNoteENWEB.pdf>. 2.

⁶³ David W. Look and Dirk H. R. Spennemann, "Disaster Management for Cultural Properties," *CRM: [Bulletin]* 23, no. 6 (2000): 3.

⁶⁴ Dirk R. Spennemann and David W. Look, "From Conflict to Dialogue, from Dialogue to Cooperation, from Cooperation to Preservation.," in *Disaster Management Programs for Historic Sites* (San Francisco, CA, U.S.A: U.S. National Park Service, 1998), 176.

⁶⁵ Spennemann and Look, "From Conflict to Dialogue" 186.

disaster managers prioritize heritage sites during disaster recovery efforts. Cultural heritage disaster management in the United States remains reactive, focusing on tangible heritage during the recovery period.⁶⁶ Restoration or recovery of damaged cultural heritage is often neglected in post-disaster reconstruction plans and the development of hazard mitigation strategies.⁶⁷ Recovery managers and engineers assessing buildings after a disaster event in the name of public safety may also be a threat to historic structures if they are not aware of their cultural significance or that they do not conform to modern building codes.⁶⁸ Many scholars have argued that well-maintained historic buildings withstand natural hazards better than modern structures;⁶⁹ this is partially due to their construction from local and climate appropriate materials to withstand common hazards. Often local preservationists know that historic buildings are easiest to restore and repair, even if they seem damaged by modern building standards.⁷⁰ The historic preservation community must be involved in disaster planning to ensure these structures and their building methods are included in protection proposals for disaster management.⁷¹

Studies on the Integration of Disaster planning into Cultural Heritage Practices

The reasons for not planning for the effects of natural hazards in institutions and cultural heritage sites may vary, but two of the most common reasons posed by scholars are a lack of

⁶⁶ Spennemann and Graham, “The Importance of Heritage Preservation in Natural Disaster Situations,” 996.

⁶⁷ Jamie MacKee, Hedda Haugen Askland, and Louise Askew, “Recovering Cultural Built Heritage after Natural Disasters: A Resilience Perspective,” *International Journal of Disaster Resilience in the Built Environment*, no. 2 (2014): 202, <https://doi.org/10.1108/IJDRBE-09-2012-0032>.

⁶⁸ Allen, “Environmental Justice, Local Knowledge, and after-Disaster Planning in New Orleans,” 158.

⁶⁹ Ann D. Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” *APT Bulletin* 47, no. 1 (n.d.): 45.

⁷⁰ Allen, “Environmental Justice, Local Knowledge, and after-Disaster Planning in New Orleans,” 158.

⁷¹ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 40.

funds to support planning⁷² or that planners do not believe that the major disaster event they need to plan for will happen in their lifetimes.⁷³ Studies have shown that in addition to protecting irreplaceable resources, disaster planning can be economical. Proactive planning for historic properties can mean less damage post-disaster, which translates to lower post-disaster emergency recovery spending.⁷⁴ However, awareness to reduce risk to irreplaceable heritage is low among disaster planners.⁷⁵ This is typically due to a lack of knowledge of the extant historic assets, failure to estimate the cost of loss and damage, and the struggle of conveying the importance of something that does not have market value.⁷⁶

Many studies have illustrated that a lack of planning for natural hazards can lead to a confused and disjointed response by local governments and outside responders.⁷⁷ In the United States for example, disaster recovery involves the management of debris and rubble; debris from historic structures can complicate recovery efforts because their disposition and collection require special review. Having disaster plans for historic resources in place before a disaster occurs

⁷² Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 93; Look and Spennemann, "Disaster Management for Cultural Properties," 5; June Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," in *Managing Disaster Risk in Emerging World Economies*, vol. 2, Disaster Risk Management (Washington, D.C.: World Bank Publications, 2008), 71.

⁷³ Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 71; Look and Spennemann, "Disaster Management for Cultural Properties," 5.

⁷⁴ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 41; United States, "State Mitigation Plan Review Guide", ii.

⁷⁵ Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 71.

⁷⁶ Randall Mason, *Chapter 18. Promoting Cultural Preservation*, *The City in the Twenty-First Century* (Philadelphia: University of Pennsylvania Press, 2006), 260; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 71.

⁷⁷ "The Case for Planning - Preservation Leadership Forum - A Program of the National Trust for Historic Preservation," accessed February 15, 2018, <http://forum.savingplaces.org/learn/issues/sustainability/disaster-relief/disaster-planning>; William L. Waugh Jr. and Gregory Streib, "Collaboration and Leadership for Effective Emergency Management," *Public Administration Review*, 2006 131–32.

recognizes these unique needs and addresses their reviews efficiently in a high-pressure situation.⁷⁸

In order to determine hazard and vulnerability at a specific site or area and adequately prepare for it, preservationists need to examine the historical record of natural disaster events, the probability that they will occur again, and estimate the severity of loss caused by the event.⁷⁹ Built heritage is particularly vulnerable under normal circumstances due to the nature of aging buildings and structures and natural hazards can increase these risks.⁸⁰ Utilizing Geographic Information Systems (GIS) databases to identify which resources are most vulnerable makes disaster management more efficient and enhances the protection and maintenance of sites that are most at risk.⁸¹

Studies of State-level Integration

Disaster planning in the United States involves public and private agencies at local, state, and federal levels, as well as volunteer organizations. While some studies have focused on the collaboration between disaster management and historic preservation at the federal level, a more recent study discussed the integration of disaster management for historic properties at the state level. Appler and Rumbach's study of SHPPs and SHMPs nationwide illustrates that although

⁷⁸ "The Case for Planning - Preservation Leadership Forum".

⁷⁹ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 42; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 74; Look and Spennemann, "Disaster Management for Cultural Properties," 3; United States, "State Mitigation Plan Review Guide" 2-1.

⁸⁰ MacKee, Askland, and Askew, "Recovering Cultural Built Heritage after Natural Disasters," 203.

⁸¹ Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 94; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 75.

natural hazards pose a threat to cultural heritage, historic preservation and disaster mitigation are still unevenly integrated at the state level.⁸²

Local preservation organizations such as state and local agencies, Main Streets, and Certified Local Governments (CLGs) have a responsibility to plan because they know the most about their community's resources and can respond quickly after a disaster event has occurred.⁸³ Planning for historic properties and cultural resources within existing policies and programs can help a community better understand their vulnerability to natural and man-made hazards.⁸⁴ If a community has these plans in place ahead of a disaster event, they are more hazard resistant and resilient because their efforts can focus on the most vulnerable resources.⁸⁵

Studies on Planning and Adapting to Climate Change

While disaster management and cultural heritage has a longer history, integrating climate change planning into this field is new in the United States; FEMA only added climate change planning as a requirement for State Disaster Mitigation Plans within the last three years. The Trump Administration's recent budget cuts to climate change research could create future challenges to disaster planning, particularly for likely impacted coastal historic resources and communities. In the discussion for planning for the effects of climate change on cultural heritage within the last decade, many studies have focused on adaptation methods that minimize climate

⁸² Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 97 & 99.

⁸³ Appler and Rumbach, 93; "The Case for Planning - Preservation Leadership Forum."

⁸⁴ Look and Spennemann, "Disaster Management for Cultural Properties," 3; United States, "State Mitigation Plan Review Guide" ii; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 74.

⁸⁵ Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 101; Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 42; United States, "State Mitigation Plan Review Guide" iii.

change effects.⁸⁶ Adapting historic resources to climate change involve both low-risk and high-risk actions, preservationists must assess the vulnerability of certain sites and types of heritage in particular scenarios to determine the scale of the possible problem.⁸⁷ There is also a need to prioritize heritage in areas that are most at risk,⁸⁸ such as those on eroding coastlines, urban areas near tidal rivers, or buried archaeology in floodplains.⁸⁹ In addition, studies on planning and adapting to climate change effects have shown that for some historic resources, mitigation may not be feasible. New assessment or documentation procedures are required to communicate the damage or loss of sites to historic preservationists and local communities.⁹⁰

Other studies have focused on climate change effects on intangible heritage. Cassar, Director of the Centre for Sustainable Heritage at University College London, argues that cultural heritage is not just a tangible phenomenon but also encompasses the social interactions and identity among people and communities. Because cultural heritage is both tangible and intangible, preservationists also need to consult with stakeholders who live or work within heritage sites to ensure their protection.⁹¹ Future engagement with policy makers should focus on a vision of conservation that is socially and environmentally responsible.⁹² The original design and construction of historic buildings had a lower impact on the environment, preserving the use of

⁸⁶ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 42; J. Heathcote, H. Fluck, and M. Wiggins, "Predicting and Adapting to Climate Change: Challenges for the Historic Environment," *Historic Environment: Policy and Practice* 8, no. 2 (03 2017): 91, <https://doi.org/10.1080/17567505.2017.1317071>.

⁸⁷ Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 91.

⁸⁸ Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 90; Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 42.

⁸⁹ Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 91.

⁹⁰ Maria Caffrey and Rebecca Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," *Park Science* 30, no. 1 (Summer 2013): 11; Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 90.

⁹¹ C.M. (1 Hall 2,3,4) et al., "Climate Change and Cultural Heritage: Conservation and Heritage Tourism in the Anthropocene," *Journal of Heritage Tourism* 11, no. 1 (01 2016): 18–19, <https://doi.org/10.1080/1743873X.2015.1082573>.

⁹² Cassar, "Sustainable Heritage," 8.

these buildings extends their productive life and reduces material waste by reusing old materials.⁹³

Another reason for the lack of climate change planning in disaster management for historic resources in the United States is the insufficient communication between all levels of government, academia, and practitioners.⁹⁴ Risk mitigation and adaptation research for climate change and cultural heritage is currently underfunded, and research based on empirical evidence is essential to develop integrated heritage and disaster management frameworks.⁹⁵ Other scholars have argued that current adaptive measures in the United States need to shift away from risk management to preparedness and mitigation for future damage.⁹⁶ In the past, increased knowledge of historical weather events improved processes for anticipating future extreme events, but this method is now outdated. For example, scientists and planners used 100-year flood events to assess the potential conditions and risks from a disaster event in a particular area.⁹⁷ As sea-level rise increases due to climate change, a 100-year event's probability changes.⁹⁸ By 2050, some areas in the United States will experience 100-year storm surges annually⁹⁹ and current estimates do not take into account how storm surge will affect areas that have previously been

⁹³ Cassar, "Sustainable Heritage," 6.

⁹⁴ Hall et al., "Climate Change and Cultural Heritage," 18.

⁹⁵ Hall et al., "Climate Change and Cultural Heritage," 19.

⁹⁶ "National Landmarks at Risk (2014)," Union of Concerned Scientists, 54, accessed October 17, 2017, http://www.ucsusa.org/global_warming/science_and_impacts/impacts/national-landmarks-at-risk-from-climate-change.html; Missy Stults, "Integrating Climate Change into Hazard Mitigation Planning: Opportunities and Examples in Practice," *Climate Risk Management* 17 (January 1, 2017): 30, <https://doi.org/10.1016/j.crm.2017.06.004>; Melissa Wagner, Netra Chhetri, and Melanie Sturm, "Adaptive Capacity in Light of Hurricane Sandy: The Need for Policy Engagement," *Applied Geography* 50 (June 1, 2014): 21, <https://doi.org/10.1016/j.apgeog.2014.01.009>.

⁹⁷ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21.

⁹⁸ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21; Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 9.

⁹⁹ Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 9.

untouched by storms.¹⁰⁰ New hazard risk assessment methods are required that incorporate current estimated climate projections to anticipate future risk. Climate change is likely to increase the severity and intensity of nearly all hazards, leaving many communities unprepared to anticipate future hazards, which could impact valuable cultural and historic resources.¹⁰¹

Research Methodology

This thesis aims to examine the integration of disaster management and historic preservation mitigation policies and planning in the United States, with a particular focus on climate change planning under the Trump Administration. I consider in this analysis not only the interactions of federal and state agencies such as FEMA and SHPO historically, but also their contemporary situation under the current administration's reversal of Obama-era policies intended to plan for the effects of climate change. Additionally, this work proposes to address how to combat these changes by integrating climate change planning for cultural heritage into disaster management at the state and local-level.

In order to establish my argument, this work will detail what climate change related legislation was in place prior to the current administration. The Grantham Research Institute on Climate Change and the Environment provides a database of climate legislation by country.¹⁰² Utilizing their information on the United States, this work will analyze when these policies were implemented, as well as their original intention. Environmental legislation to help curb pollution

¹⁰⁰ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21; Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 9.

¹⁰¹ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21.

¹⁰² "United States of America," *Grantham Research Institute on Climate Change and the Environment* (blog), accessed March 3, 2018, <http://www.lse.ac.uk/GranthamInstitute/country-profiles/united-states-of-america/>.

such as the Clean Water Act and the NEPA have existed in the United States since the 1960's;¹⁰³ however, climate change specific legislation was only recently passed under the Obama Administration.¹⁰⁴ While the Grantham Institute database does not include the Trump Administration's reversal of Obama-era climate change legislation, my research will collect information from a wide range of sources including journal articles, newspaper articles, and government agency websites to determine which legislation the current administration has reversed or modified.

Lack of federal legislative support for disaster management for historic properties can lead to a lack of planning and funding for cultural resources, which leaves them vulnerable to extreme weather events and other climate change effects. Although previous presidential administrations have made policy changes that affect climate change mitigation and disaster management for historic properties,¹⁰⁵ the Trump Administration is the first to directly reverse dedicated climate change legislation. In addition to legislative changes made at the federal level, this research will also detail and analyze the current administration's actions that directly impact climate change planning for historic resources such as the President's funding cuts and Executive Orders, as well as the Administration's censorship of federal scientific information and their response to recent climatic events. The denial of climate change and undermining climate research is not unique to the Trump Administration;¹⁰⁶ however, the current administration's

¹⁰³ OA US EPA, "EPA History," Collections and Lists, US EPA, October 13, 2016, <https://www.epa.gov/history>.

¹⁰⁴ "United States of America," Grantham Research Institute on Climate Change and the Environment (blog), accessed March 3, 2018, <http://www.lse.ac.uk/GranthamInstitute/country-profiles/united-states-of-america/>.

¹⁰⁵ "United States of America," Grantham Research Institute on Climate Change and the Environment (blog), accessed March 3, 2018, <http://www.lse.ac.uk/GranthamInstitute/country-profiles/united-states-of-america/>.

¹⁰⁶ Kari De Pryck, and Francois Gemenne. "The Denier-in-Chief: Climate Change, Science and the Election of Donald J. Trump." *Law and Critique* 28, no. 2 (01 2017): 122. <https://doi.org/10.1007/s10978-017-9207-6>.

stance on climate change is critical to understanding the need for state and local climate change planning for historic resources because the effects of climate change are currently underway.

I will conduct the remainder of the research on climate change planning through an examination of existing state and local historic resource disaster management plans. Florida experiences a number of natural hazards¹⁰⁷ and their Department of State Division of Historical Resources (Florida SHPO) has recognized the unique needs of historic resources in disaster mitigation and preparedness.¹⁰⁸ Both the National Trust for Historic Preservation (NTHP) and Appler and Rumbach in their 2015 study of disaster management of historic properties reference 1000 Friends of Florida and the Florida SHPO's disaster management plan for historic properties as a best practice resource for disaster mitigation planning.¹⁰⁹ In addition, The NTHP lists case studies in Pennsylvania and Annapolis, Maryland as additional examples of state and local disaster planning for historic properties.¹¹⁰

The purpose of examining how disaster mitigation is integrated into historic resource planning at the state level through case studies of state and local plans in Florida, Pennsylvania, and Maryland is to establish what disaster planning methods for historic resources and climate change effects are already in place. In addition, this analysis will identify any gaps in planning that still may exist and propose how to fill those gaps based on recommended actions in FEMA and NPS guidelines. The aim of these findings compared to the current lack of federal climate change planning will ultimately illustrate how states can be prepared as possible for the effects of climate change on historic resources without the continued support of the federal government.

¹⁰⁷ "Disaster Planning | 1000 Friends of Florida." Accessed March 9, 2018. <http://www.1000friendsofflorida.org/building-better-communities/disaster-planning/>.

¹⁰⁸ "Guidance for Disaster Mitigation and Recovery for Historic Properties - Division of Historical Resources - Florida Department of State." Accessed March 9, 2018. <http://dos.myflorida.com/historical/preservation/architectural-preservation-services/guidance-for-disaster-mitigation/>.

¹⁰⁹ "The Case for Planning - Preservation Leadership Forum"; Appler and Rumbach, "Building Community Resilience Through Historic Preservation," 94.

¹¹⁰ "The Case for Planning - Preservation Leadership Forum."

I will conduct the analysis of these plans and planning processes with a checklist (Appendix B) I created to determine if these plans are adequately incorporating climate change planning into their mitigation efforts. I created the checklist based on a content analysis of FEMA's State Mitigation Plan Review Guide¹¹¹ and Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning¹¹² publication as well as the NPS's Cultural Resources Climate Change Strategy (CRCC).¹¹³ FEMA's State Mitigation Plan Review Guide includes a checklist to document how the state mitigation plan meets the regulations required by the guide.¹¹⁴ My checklist adapts FEMA's existing checklist to include other recommendations specific to historic resource planning from Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning and the CRCC.

FEMA's guidelines for Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning is a step-by-step guide to integrate historic resources into disaster management. The adapted checklist includes specific steps such as: *Does the plan identify resources for hazard mitigation related to historic properties and cultural resources?*¹¹⁵ in order to evaluate if these state and local plans are implementing FEMA's recommended planning steps for historic resources. Additionally, the checklist includes recommended actions from the NPS's CRCC. The CRCC includes directions for action under each of the plan's four goals: Connect Impacts and Information, Understand the Scope, Integrate

¹¹¹ United States, "State Mitigation Plan Review Guide".

¹¹² United States. Department of the Homeland Security. Federal Emergency Management Agency, "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning," 2005, <https://www.fema.gov/media-library-data/20130726-1522-20490-2886/howto6.pdf>.

¹¹³ National Park Service, "Cultural Resources Climate Change Strategy" (Washington, D.C.: Cultural Resources, Partnerships, and Science, 2016), https://www.nps.gov/subjects/climatechange/upload/NPS-2016_Cultural-Resources-Climate-Change-Strategy.pdf.

¹¹⁴ United States, "State Mitigation Plan Review Guide,". 44–47.

¹¹⁵ United States, "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning," 1-1.

Practice, and Learn and Share.¹¹⁶ The checklist adapts these directives, namely those regarding adaptation options for historic resources, in order to evaluate how well these state and local plans are planning for future climate impacts on cultural heritage.

¹¹⁶ National Park Service, “Cultural Resources Climate Change Strategy,” 4-5

Chapter 2: Preparing Cultural Heritage for Disaster Events

A variety of natural hazards impact communities throughout the United States; some of these impacts, when destructive, become disasters that endanger communities as well as their cultural and historic resources. While we cannot prevent disaster events from happening, we can attempt to mitigate their damage. Damage to historic resources from natural hazards have effects on both economic activity and the emotional recovery of a community.¹¹⁷ Historic resources are valuable economic assets by increasing property values and catalyzing economic development through historic downtowns and Main Street programs.¹¹⁸ Local landmarks and historic structures form a sense of place integral to mental health and well-being for a community as well as encouraging a sense of resiliency after a disaster event.¹¹⁹ Historic resources such as sites, landscapes, buildings, and monuments link community identity with a particular place in public health studies and climate change is disrupting these relationships with place identity.¹²⁰ Early disaster planning is a critical step for communities and their cultural resources because major adaptation and planning strategies can take years to implement.¹²¹

In this chapter, I will discuss the importance of planning for historic properties before natural hazards lead to disaster events as well as the complicated nature of the post-disaster mitigation and repair of historic structures due to Section 106 review. This chapter will also explore how historic properties and cultural heritage contribute to community recovery following a disaster event. Finally, I will discuss how the responses to both Hurricane Katrina (2005) and

¹¹⁷ Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 92; “The Case for Planning - Preservation Leadership Forum.”

¹¹⁸ Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 94; “The Case for Planning - Preservation Leadership Forum.”

¹¹⁹ Jeremy J. Hess, Josephine N. Malilay, and Alan J. Parkinson, “The Health Impacts of Climate Change: Climate Change. The Importance of Place,” *American Journal of Preventive Medicine* 35, no. 5 (2008): 475–76, <https://doi.org/10.1016/j.amepre.2008.08.024>.

¹²⁰ Hess, Malilay, and Parkinson, 468.

¹²¹ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

Hurricane Sandy (2012) highlight the importance of local expertise in historic preservation as well as in pre-disaster mitigation for historic properties. To produce an effective response to disaster recovery, early disaster planning must account for mitigation planning as well as reducing damage and costs from future disaster events.¹²²

Planning Before a Disaster Strikes

In 1979, President Carter established FEMA via Executive Order 12148.¹²³ However, it was not until the Clinton administration that FEMA's planning efforts focused on the "life-cycle" of a disaster. In the 1990's, FEMA emphasized mitigation planning and created programs to reduce damage and costs from future disaster events.¹²⁴ These approaches also applied to disaster preparedness for historic properties with the advent of programmatic agreements in 1993.¹²⁵ A preservationist's role before a disaster situation is to help a community or cultural heritage site avoid or minimize damage to historic resources. Preservationists can help reduce the chaos involved in decision making by providing accurate information regarding local historic resources.¹²⁶ Having disaster plans, supplies, and staff training in place ahead of time creates an efficient response to the disaster recovery of historic properties. Disaster pre-planning and mitigation that clearly identifies the necessary historic preservation specialists, technical

¹²² United States, "State Mitigation Plan Review Guide," 13–14.

¹²³ Olshanky and Johnson, "The Evolution of the Federal Role in Supporting Community Recovery After U.S. Disasters," 297; Romain Huret and Randy J. Sparks, *Explaining the Unexplainable: Hurricane Katrina, FEMA, and the Bush Administration* (Baton Rouge: Louisiana State University Press, 2014); Abdul-Akeem Sadiq, Kevin Tharp, and John D. Graham, "FEMA versus Local Governments: Influence and Reliance in Disaster Preparedness," *Natural Hazards* 82, no. 1 (2016): 125, <https://doi.org/10.1007/s11069-016-2183-6>; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 22; Waugh Jr. and Streib, "Collaboration and Leadership for Effective Emergency Management," 132.; Exec. Order. No. 12148, 44 Fed. Reg. 43239 (July 20, 1979), <https://www.archives.gov/federal-register/codification/executive-order/12148.html>.

¹²⁴ Huret and Sparks, *Explaining the Unexplainable*.

¹²⁵ Godschalk, *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*, 181.

¹²⁶ Michael A. Tomlan and David Listokin, *Historic Preservation: Caring for Our Expanding Legacy* (Cham; Heidelberg; New York; Dordrecht; London: Springer, 2015). 253.

information, and funding is necessary to protect historic resources before a disaster event occurs.¹²⁷

Planning for cultural heritage disaster management involves documentation and maintenance of sites to account for their specific attributes (e.g., unique architectural features that are not easily replicated) and vulnerabilities (e.g., the building is constructed in a floodplain).¹²⁸ Inventories of cultural heritage resources are the basis for disaster management of historic resources; in order to safeguard assets you must know what resources are present.¹²⁹ GIS databases are helpful in this arena, providing an inexpensive method to accurately document and map sites.¹³⁰ Identifying “high risk” cultural heritage sites by cross-referencing historic resource inventories with high-risk hazard areas can help identify which resources are most vulnerable.¹³¹ In the United States, preservationists and communities have a responsibility to identify higher risk sites to prioritize mitigation efforts,¹³² create emergency operations plans for the most vulnerable

¹²⁷ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 1–1.

¹²⁸ Taboroff, “Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation,” 75; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–1 & 2–4.

¹²⁹ Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 94; Taboroff, “Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation,” 75; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–1; Spennemann and Look, “From Conflict to Dialogue,” 185; Deidre McCarthy, “Facing Disaster: The Importance of Heritage Inventories in Preparation and Response,” *Conservation Perspectives*, Heritage Inventories, 28, no. 2 (Fall 2013): 16; “The Case for Planning - Preservation Leadership Forum”; Peter Stone, “War and Heritage: Using Inventories to Protect Cultural Property,” *Conservation Perspectives*, Heritage Inventories, 28, no. 2 (Fall 2013): 13.

¹³⁰ Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 101; Taboroff, “Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation,” 75–76; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–6 & 2–8; McCarthy, “Facing Disaster: The Importance of Heritage Inventories in Preparation and Response,” 16.

¹³¹ Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 101; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–6; Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 42; Taboroff, “Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation,” 74–75.

¹³² Appler and Rumbach, “Building Community Resilience Through Historic Preservation,” 101; Taboroff, “Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation,” 76;

sites and institutions, and to allocate resources and funding for planning and mitigation implementation.¹³³ Individual site plans are also essential to disaster management. They include such information as the composition of disaster teams, evacuation of moveable materials, cleaning during recovery, evaluating structural damage with engineers and historic architects, securing funding to recover sites to pre-disaster conditions, and training of staff to handle a disaster response.¹³⁴

Disaster planning involves both public and private agencies at local, state, and federal levels, as well as non-profits and NGOs. Integrating disaster management planning into CLGs and Main Street Programs can help in the integration of these civic programs. These local community programs function to preserve and protect historic resources from threats such as development and natural hazards. In addition, the NTHP argues that private organizations can help fill the service gaps left by state and local governments by asking the following questions:

- What preservation needs are or are not being met by local, state, and federal actors? What have been or are likely to be the limitations of those actors?
- What organizational strengths can we bring to planning and response efforts? How can we partner with other organizations (i.e. fire departments or assessment teams) to offer guidance and improve services?
- What resources can we offer to homeowners, building owners, property stewards, neighborhoods, and the larger community?
- Can we help coordinate a volunteer force?¹³⁵

Historic resources require special consideration because their unique status can complicate recovery efforts. During recovery they are often most vulnerable to damage due to lack of

Silverman, "Toward a National Disaster Response Protocol," 507; United States, "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning," 2–1.

¹³³ Silverman, "Toward a National Disaster Response Protocol," 508; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 79.

¹³⁴ Look and Spennemann, "Disaster Management for Cultural Properties," 3; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 76.

¹³⁵ "The Case for Planning - Preservation Leadership Forum

weatherproofing, structural instability or even expedient demolition.¹³⁶ Historic resources also require special review under FEMA’s Section 106 requirement of the NHPA.¹³⁷

FEMA developed the 2005 Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning: State and Local Mitigation Planning How-to Guide to assist tribes, states, and local governments in creating an effective hazard mitigation plan for historic resources. In order to qualify for FEMA funding, tribes, states, and local communities must have state mitigation guides in place.¹³⁸ Grant writers, project developers, planners, emergency managers, and community leaders as well as state, local, and tribal governments utilize FEMA’s publication in conjunction with the other plans in the Mitigation Planning “How-To” series to create an effective hazard mitigation plan.¹³⁹

The guide outlines four steps to integrate historic preservation planning into hazard mitigation planning: Organize resources, Assess risks, Develop a mitigation plan, and Implement the Plan and Monitor progress (Figure 2.1).¹⁴⁰ Organizing resources involves assessing the level of support for historic resources in the community as well as identifying resources for hazard mitigation of historic properties and recruiting experts to join the planning team.¹⁴¹ Assessing risks involves identifying the hazards that can affect a community, estimating the magnitude of each hazard, and creating an inventory of the vulnerable historic resources in the area, as well as

¹³⁶ David W. Look and Dirk H. R. Spennemann, “Disaster Preparedness, Planning, and Mitigation,” *CRM: [Bulletin]* 24, no. 8 (2001): 3; “The Case for Planning - Preservation Leadership Forum.”

¹³⁷ “The Case for Planning - Preservation Leadership Forum”; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 4–3.

¹³⁸ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” i.

¹³⁹ “Mitigation Planning How-To Series (12) | FEMA.Gov,” accessed September 2, 2018, <https://www.fema.gov/media-library/resources-documents/collections/6>.

¹⁴⁰ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” foreword.

¹⁴¹ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 1–1.

estimating the potential losses.¹⁴² Developing a mitigation plan entails creating mitigation goals and priorities for preservation priorities, evaluating and prioritizing actions, and preparing an implementation strategy for these actions.¹⁴³ The final step, implement and monitor progress, focuses on collaboration with other agencies and stakeholders in addition to updating the plan and inventory as needed to ensure compliance with Section 106 review.¹⁴⁴



Figure 2.1: FEMA, The Hazard Mitigation Planning Process, in Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning, <https://www.fema.gov/media-library-data/20130726-1522-20490-2886/howto6.pdf>, foreword, (accessed September 8, 2017)

As useful as FEMA's publication is, very few communities and municipalities have taken advantage of its methodology. In 2011, Tulsa, Oklahoma was the first municipality to integrate historic properties into their hazard mitigation plan utilizing this guide. In addition, Annapolis,

¹⁴²United States, 2–1..

¹⁴³ United States, 3–1.

¹⁴⁴ United States, 4–1,

Maryland, is completing the integration based on FEMA's methodology,¹⁴⁵ becoming one of the first United States cities to do so.

At the federal level of disaster management, the National Disaster Recovery Framework (NDRF) represents the United States' first explicit statement of federal recovery policy.¹⁴⁶ The NDRF focuses on coordinating with the entire community to accelerate the recovery process by integrating mitigation, resilience, and sustainability into a local community's short and long-term recovery goals.¹⁴⁷ This includes efforts to conserve natural and cultural resources that contribute to the community's economy and identity. The NDRF includes the critical tasks for preparing natural and cultural resources for a disaster event:

- Implement measures to protect and stabilize records and culturally significant documents, objects, and structures.
- Mitigate the impacts to and stabilize the natural and cultural resources and conduct a preliminary assessment of the impacts that identifies protections that need to be in place during stabilization through recovery.
- Complete an assessment of affected natural and cultural resources and develop a timeline that includes consideration of available human and budgetary resources for addressing these impacts in a sustainable and resilient manner.
- Preserve natural and cultural resources as part of an overall community recovery that is achieved through the coordinated efforts of natural and cultural resource experts and the recovery team in accordance with the specified timeline in the recovery plan.¹⁴⁸

The NDRF promotes best practices for the planning, mitigation, and recovery of cultural and historic resources as well as the long-term recovery of the entire community.¹⁴⁹

The State Mitigation Plan review guide encompasses the official policy and interpretation of natural hazard mitigation planning requirements for individual states.¹⁵⁰ Like the NDRF, it also

¹⁴⁵ "Before the (Next) Storm: The Disaster Planning for Historic Properties Initiative," Pennsylvania Historic Preservation, February 4, 2015, <https://pahistoricpreservation.com/next-storm-disaster-planning-historic-properties-initiative/>.

¹⁴⁶ United States, "National Disaster Recovery Framework," i.

¹⁴⁷ United States, "National Disaster Recovery Framework," i.

¹⁴⁸ United States, "National Disaster Recovery Framework," 33.

¹⁴⁹ "Following in Sandy's Path: \$1.5 Million Awarded to PA for Recovery and Planning," Pennsylvania Historic Preservation, February 12, 2014, <https://pahistoricpreservation.com/following-sandys-path/>.

¹⁵⁰ United States, "State Mitigation Plan Review Guide," 1.

requires the consideration of natural and historic resources in mitigation efforts.¹⁵¹ The State Mitigation Plan review guide encourages coordination with other agencies and stakeholders to assess the risk to historic resources as part of the larger community planning effort.¹⁵² The updated 2015 guide also encourages consideration of climate change and its impacts on future hazards as a part of risk assessment to reduce risks and potential damage. Climate change is currently an unknown quantity and the guide expects states to use the whole community to plan for its potential impacts.¹⁵³

Disaster preparedness is a cycle; disaster managers interpret information and feedback from past disasters to revise plans and prepare for the next event. Both FEMA's guide and the NDRF can assist states, municipalities, and tribes in preparing their historic resources for disaster events by providing information on specific post-disaster programs, agencies, and policies before a disaster strikes. Utilizing these resources ahead of time to create an effective State Mitigation Plan, allows communities to assist disaster managers during recovery and reconstruction to make their historic resources more resilient to the destructive effects of future disaster events.

Disaster Recovery and the Unified Federal Review

During the recovery and reconstruction period after Hurricane Sandy, Congress passed the Sandy Recovery Improvement Act (SRIA) to help expedite recovery funds to affected states and municipalities. Under the SRIA, Congress also directed federal agencies involved in disaster response and long-term recovery to create a Unified Federal Review process to coordinate and expedite the various environmental and historic reviews required by several federal laws, most

¹⁵¹ United States, "State Mitigation Plan Review Guide," 3.

¹⁵² United States. Department of the Homeland Security. Federal Emergency Management Agency, 12.

¹⁵³ United States, "State Mitigation Plan Review Guide," 13–14.

notably the NEPA and NHPA.¹⁵⁴ As discussed in Chapter 1, the NEPA and NHPA's main purpose is to safeguard the United States' natural and historic resources and provide a method for evaluating those resources. The review procedures outlined by these laws direct federal agencies to examine how the proposed undertaking will impact the natural and historic environment. The SRIA mandates that federal agencies establish an expedited, Unified Environmental and Historic Preservation review process for disaster recovery actions.¹⁵⁵

Since the creation of the EHP after Hurricane Hugo in 1989 and the introduction of Programmatic Agreements after the Midwest floods of 1993, FEMA's review process for historic and natural resources has become more efficient and integrated. The new Unified Federal Review process includes all federal laws, statutes, and executive orders that require federal review before granting funds. Environmental laws in the review include the Coastal Zone Management Act, the Coastal Barrier Resources Act, the Endangered Species Act, Clean Water Act, Clean Air Act, as well as Executive Orders 11988 (floodplain management), and Executive Order 11990 (Protection of Wetlands).¹⁵⁶ Each law, regulation, and Executive Order has a corresponding regulatory agency that ensures the protection of natural and historic resources through consultation and grant funding.¹⁵⁷ FEMA is one of the main funding agencies that provides public assistance through grants after a major disaster. When FEMA conducts a review, they must consult with other regulatory agencies regarding the reviews for natural and environmental

¹⁵⁴ Federal Emergency Management Agency United States Department of Homeland Security, "SRIA Fact Sheet," March 4, 2014, 6, https://www.fema.gov/media-library-data/1394805512529-69dda27af3e128a1406387d288fd162c/SRIA+Overview+Fact+Sheet+and+Status+Updated+03042014_508.pdf.

¹⁵⁵ "SRIA Fact Sheet," 6.

¹⁵⁶ David E. McEntire, "Promoting Recovery and Mitigation," in *Disaster Response and Recovery: Strategies and Tactics for Resilience*, Second (Hoboken, NJ: John Wiley & Sons, Inc., 2015), 289; John T. Marshall, "Weathering NEPA Review: Superstorms and Super Slow Urban Recovery," *Ecology Law Quarterly* 41 (2014): 89, <https://doi.org/10.15779/Z38683C>.

¹⁵⁷ FEMA United States Department of Homeland Security and Advisory Council on Historic Preservation, *Unified Federal Environmental and Historic Preservation Review Guide for Federal Disaster Recovery Assistance Applications*, 16, accessed June 24, 2018, https://www.fema.gov/media-library-data/1440713845421-9bdb5c0c8fe19ab86d97059ccb26e3b4/UFR_Applicant_Guide_Final_508.pdf.

resources unless previous agreements are in place.¹⁵⁸ FEMA is also the regulatory agency for the NHPA Section 106 review. Much like the environmental laws, FEMA must conduct consultations with other government agencies such as SHPOs and the NPS when reviewing historic resources unless a programmatic agreement is in place.¹⁵⁹

Following Hurricane Sandy, both New York and New Jersey's SHPOs, as well as participating Tribes and THPOs, passed a programmatic agreement with FEMA. These agreements help expedite NHPA's required reviews under federal law for Sandy-related damage and any other disaster events that occur over the five-year period while the agreement is in place. Most notably, Section 106 review to ensure there are no adverse effects on historic properties listed or eligible for listing on the NRHP. To accomplish this, the programmatic agreements for both states outline a series of programmatic allowances that are exempt from Section 106 review and do not require further consultation with the individual state's SHPO, THPO, and participating tribes. These actions have no adverse effect on historic structures or unexcavated resources¹⁶⁰ and are divided into two categories. Those in Category 1 (Tier I in New York), involve recovery actions and temporary alterations such as debris removal, temporary installation of structures for essential social and emergency services, minor upgrades for energy efficiency such as replacing insulation, and any repairs done on buildings less than 45 years old.¹⁶¹ In both states, this first class of programmatic allowances is exempt from Section 106 review and any FEMA staff can

¹⁵⁸ FEMA United States Department of Homeland Security and Advisory Council on Historic Preservation, *Unified Federal Environmental and Historic Preservation Review Guide for Federal Disaster Recovery Assistance Applications*, 16–17.

¹⁵⁹ FEMA United States Department of Homeland Security and Advisory Council on Historic Preservation, *Unified Federal Environmental and Historic Preservation Review Guide for Federal Disaster Recovery Assistance Applications*, 16–17.

¹⁶⁰ "Programmatic Agreement for the State of New Jersey, Section 106 of the NHPA (February 2013) | FEMA.Gov," 12, accessed October 3, 2017, <https://www.fema.gov/media-library/assets/documents/30641>; "Programmatic Agreement for the State of New York, Section 106 of the NHPA (February 2013) | FEMA.Gov," 26, accessed July 8, 2018, <https://www.fema.gov/media-library/assets/documents/30669>.

¹⁶¹ "Programmatic Agreement for the State of New Jersey," 12–13; "Programmatic Agreement for the State of New York," 26–29.

approve these changes without specific historic preservation qualification standards as long as the materials are repaired or replaced in-kind.¹⁶²

The second class of programmatic allowances known as Category 2 or Tier II must adhere to the Secretary of the Interior's Standards for the Treatment of Historic Properties and FEMA staff who meet the Secretary's Professional Qualifications standards must review them.¹⁶³ Category 2 allowances include the installation and elevation of HVAC systems, repairing masonry, mold removal and remediation, replacement or installation of fire detection and suppression systems, in-kind repairs of windows and doors, in-kind repair and replacement of landscape elements and removal of debris from cemeteries.¹⁶⁴ More involved changes to historic structures such as replacing doors, windows, and elevating HVAC systems must meet certain requirements to ensure the historic structure's integrity. For example, doors and windows should match in design, color, texture and materials of the extant historic character of the building or structure and any elevation changes made to HVAC systems must not be visible from the street.¹⁶⁵ In-kind replacements apply to existing structures; typically, new construction is not permitted under these allowances. In New York's programmatic allowances however, elevation, demolition, and reconstruction of entire structures is permitted on structures less than 45 years old if they are not located within or next to a historic district.¹⁶⁶ Like Section 106 review, all of these allowances minimize and mitigate any adverse effects to historic properties. If the undertaking does not fall into one of the allowance categories, consultation with the individual state's SHPO,

¹⁶² "Programmatic Agreement for the State of New Jersey," 12; "Programmatic Agreement for the State of New York," 26.

¹⁶³ "Programmatic Agreement for the State of New Jersey," 13; "Secretary's Standards--Qualifications Standards," accessed September 2, 2018, https://www.nps.gov/history/local-law/arch_stnds_9.htm; "Programmatic Agreement for the State of New York, Section 106 of the NHPA (February 2013) | FEMA.Gov," 26.

¹⁶⁴ "Programmatic Agreement for the State of New Jersey," 13–14; "Programmatic Agreement for the State of New York," 29–35.

¹⁶⁵ "Programmatic Agreement for the State of New Jersey," 10; "Programmatic Agreement for the State of New York," 30.

¹⁶⁶ "Programmatic Agreement for the State of New York," 35.

participating Tribes, THPO, as well as other state and federal agencies may be required depending on the historic resource. For example, if the historic resource is a National Historic Landmark, FEMA must consult with NPS in the event of an adverse effect.

Programmatic Agreements are typically valid for five years; at the time of writing, it is nearly six years after Hurricane Sandy, but these programmatic agreements were not fully in effect until two years after the storm in 2014. In 2019, FEMA should enact a new agreement with NY's and NJ's SHPOs to ensure the protection of historic resources if another major disaster event occurs in the near future. The protection of historic properties and their relationship to a community's identity and resilience is essential because heritage resources are finite and non-renewable, once they are gone we can never recreate them in their original historic context.¹⁶⁷ The Intergovernmental Panel on Climate Change's (IPCC) special report on Global Warming of 1.5 °C released in October 2018 estimates that the world only has ten years to get climate change under control.¹⁶⁸ Federal, state, and local governments need climate change planning for cultural heritage now because extreme and damaging weather events will continue to increase.¹⁶⁹

Cultural Heritage and Community Recovery

Major natural disasters and the destruction they cause are traumatic to a community. Cultural heritage in both tangible and intangible forms can contribute to a community's recovery during these taxing times. Most studies on how cultural heritage contribute to community

¹⁶⁷ Cassar, "Sustainable Heritage," 7; Taboroff, "Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation," 71; United States, "National Disaster Recovery Framework," June 2016, 32.

¹⁶⁸ IPCC, "Global Warming of 1.5 °C," IPCC, October 8, 2018, <http://www.ipcc.ch/report/sr15/>; Chris Mooney and Brady Dennis, "The World Has Just over a Decade to Get Climate Change under Control, U.N. Scientists Say," Washington Post, October 7, 2018, https://www.washingtonpost.com/energy-environment/2018/10/08/world-has-only-years-get-climate-change-under-control-un-scientists-say/?utm_term=.c5385214af0f.

¹⁶⁹ Silverman, "Toward a National Disaster Response Protocol," 497.

recovery primarily focus on heritage in post-conflict situations.¹⁷⁰ Those that focus on how cultural heritage contributes to recovery from disasters discuss the historic environment's ability to promote resiliency among those recovering from the trauma of disaster events and cultural heritage's ability to contribute to a community's "sense of place".¹⁷¹

In New Orleans, as well as other cities and towns throughout the United States, historic resources including historic homes, museums, and cemeteries, are essential to the community's economic recovery.¹⁷² Just as pro-active disaster planning for historic properties saves money on recovery efforts and repairs post-disaster,¹⁷³ planning for the effects of climate change on historic properties is also a good business practice. Historic resources benefit national and local economies through tourist and development activities, losing these resources to sea-level rise and other climate change impacts is a threat to economic activity.¹⁷⁴

All places have both economic and cultural value that contribute to the "quality of life" of an area; however, Hurricane Katrina recovery efforts overlooked cultural values New Orleans. Cultural values and urban identity were critical to recovery in New Orleans after Hurricane Katrina, bridging historic and contemporary periods.¹⁷⁵ Cultural heritage and "ways of living

¹⁷⁰ Trinidad Rico, "The Limits of a 'heritage at Risk' Framework: The Construction of Post-Disaster Cultural Heritage in Banda Aceh, Indonesia," *Journal of Social Archaeology* 14, no. 2 (2014): 159, <https://doi.org/10.1177/1469605314527192>.

¹⁷¹ "The Case for Planning - Preservation Leadership Forum"; Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 47; Annie Christoff, "House of the Setting Sun: New Orleans Katrina, and the Role of Historic Preservation Laws in Emergency Circumstances [Notes]," *Georgetown Law Journal*, no. 3 (2006): 24.

¹⁷² Thomas J. Campanella, "Urban Resilience and the Recovery of New Orleans," *Journal of the American Planning Association* 72, no. 2 (Spring 2006): 144; Jacob Wagner, Michael Frisch, and Billy Fields, "Building Local Capacity: Planning for Local Culture and Neighborhood Recovery in New Orleans," *Cityscape*, Design and Disaster: Higher Education Responds to Hurricane Katrina, 10, no. 3 (2008): 40.

¹⁷³ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 41; United States, "State Mitigation Plan Review Guide," ii.

¹⁷⁴ "The Case for Planning - Preservation Leadership Forum

¹⁷⁵ Mason, *Chapter 18. Promoting Cultural Preservation*, 262; Christoff, "House of the Setting Sun," 3.

together”¹⁷⁶ have intangible and tangible aspects; they are priceless because they are irreplaceable. Market values monetize economic value, but cultural values are considered non-use because you cannot place market value on a feeling or meaning;¹⁷⁷ someone’s “place” or “home” cannot just be exchanged for money.¹⁷⁸ Both conservation of cultural resources and economic development are essential to understanding the importance of disaster planning for historic properties but recovery efforts in the United States typically disregard cultural values because they are not easily measured.¹⁷⁹

Hurricane Katrina also highlighted the importance of sense of place and issues related to displacement and resettlement.¹⁸⁰ An intact relationship with a place is essential to mental health and natural hazards such as hurricanes can cause physical and mental stress in addition to affecting coping skills.¹⁸¹ After Hurricane Katrina, displaced residents left New Orleans for other states and cities, namely Houston, Texas. Those considering returning to their flood-prone communities in New Orleans justified the decision based on “there’s no place like New Orleans”.¹⁸² Residents’ described their home as a combination of social networks, distinctly “New Orleans” food and music, the outdoor-event friendly climate as well as intangible elements such as the social freedom of public drinking and music heard from another block.¹⁸³ Hurricane Katrina highlighted the importance of a “sense of place”¹⁸⁴ and these same processes are present in Native Alaskan populations who are experiencing the early effects of climate change.

¹⁷⁶ Mason, *Chapter 18. Promoting Cultural Preservation*, 265.

¹⁷⁷ Mason, 260.

¹⁷⁸ Mason, 273.

¹⁷⁹ Mason, 260–61.

¹⁸⁰ Hess, Malilay, and Parkinson, “The Health Impacts of Climate Change: Climate Change. The Importance of Place,” 471.

¹⁸¹ Hess, Malilay, and Parkinson, 470.

¹⁸² Emily Chamlee-Wright and Virgil Henry Storr, “‘There’s No Place Like New Orleans’: Sense of Place and Community Recovery in the Ninth Ward After Hurricane Katrina,” *Journal of Urban Affairs* 31, no. 5 (December 1, 2009): 621, <https://doi.org/10.1111/j.1467-9906.2009.00479.x>.

¹⁸³ Chamlee-Wright and Storr, 623.

¹⁸⁴ Hess, Malilay, and Parkinson, “The Health Impacts of Climate Change,” 471.

Relocation and loss of place is traumatic for an individual and the psyche-breaking bonds with place have detrimental health effects.¹⁸⁵ After years of shoreline erosion in the Native Alaskan Inupiat village of Shishmaref, Alaska, the community voted to relocate to the Alaskan mainland five miles away, uprooting their cultural traditions and crafts.¹⁸⁶ As climate change is eroding the physical place of the Native Alaskan environment, relocation of these communities may lead to a loss of traditional cultural traditions causing mental health challenges within the community including depression, anxiety, and suicidality.¹⁸⁷ Even if a community is not physically displaced, the way that natural hazards alter a place can disrupt people's attachment and precipitate culture loss.¹⁸⁸ The arctic has warmed at more than twice the global average since the 1980s¹⁸⁹ and climate change is affecting the ancestral sites and organic artifacts of Native Alaskan communities. Permafrost thaw, rising air temperatures, changes in precipitation, melting glaciers, coastal erosion, and rising sea levels are causing physical damage to organic artifacts in the Arctic. Warmer temperatures also encourage tourism and too many visitors could endanger sensitive archaeological sites.¹⁹⁰ Cultural heritage contributes to a community's social identity and community resilience;¹⁹¹ climate change is a growing threat to Native Alaskan cultural heritage and archaeologists are running out of time to preserve and protect it.¹⁹²

¹⁸⁵ Hess, Malilay, and Parkinson, "The Health Impacts of Climate Change," 475.

¹⁸⁶ "America's Eroding Edges: Climate Change in Context," National Trust for Historic Preservation: Preservation Leadership Forum, May 24, 2017, https://forum.savingplaces.org/blogs/victoria-herrmann/2017/05/24/americas-eroding-edges-climate-change-in-context?_ga=2.247348236.929573910.1533321318-1659594258.1530908444.

¹⁸⁷ Hess, Malilay, and Parkinson, "The Health Impacts of Climate Change," 475.

¹⁸⁸ Hess, Malilay, and Parkinson, "The Health Impacts of Climate Change," 475.

¹⁸⁹ Jorgen Hollesen et al., "Climate Change and the Deteriorating Archaeological and Environmental Archives of the Arctic," *Antiquity* 92, no. 363 (2018): 574, <https://doi.org/10.15184/aqy.2018.8>.

¹⁹⁰ Hollesen et al., 574–75.

¹⁹¹ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 40; Christoff, "House of the Setting Sun," 30.

¹⁹² Tim Ellis, "Climate Change Destroying Natives' Relics," KUAC, June 5, 2015, <http://fm.kuac.org/post/climate-change-destroying-natives-relics>.

Heritage objects and sites that display disaster destruction and loss can also help local communities cope with the trauma of the disaster event. The “tsunami boats” (i.e. boats that washed up onshore and were not removed) present in Indonesia after the 2004 Indian earthquake and tsunami helped build a “disaster identity” for individuals affected by the natural disaster.¹⁹³ This type of post-disaster cultural heritage embodies the trauma, resilience, mitigation, and recovery experienced by a community.¹⁹⁴ Recognizing these new forms of heritage that show the signs of destruction from a natural disaster can help local residents process this shared traumatic experience.¹⁹⁵ However, the “tsunami boats” represent a new form of cultural heritage that the western heritage framework tends to ignore. Informal sites created by events of recent history do not qualify as heritage in a framework based on arbitrary age benchmarks.¹⁹⁶ However, promoting these new sites of post-natural disaster destruction as heritage spaces can teach disaster preparedness so that “disastrous impacts can be minimized in the future and people can grow wiser.”¹⁹⁷

In the past, disaster recovery in the United States lacked an understanding of the importance of place and community identity as part of disaster reconstruction and the recovery of a community. Disaster managers need to understand the affect that cultural properties have on the psyche of the population, and how they are integral to a community and its recovery.¹⁹⁸ Preservationists must stress a community’s need to protect cultural heritage in place, relocate it, or the need to document properties whose destruction is inevitable.¹⁹⁹ Communication must occur across the board among preservationists, disaster managers, and community planners, especially

¹⁹³ Trinidad Rico, *Constructing Destruction: Heritage Narratives in the Tsunami City* (New York: Routledge, Taylor & Francis Group, 2016), 87.

¹⁹⁴ Rico, *Constructing Destruction*, 102.

¹⁹⁵ Rico, *Constructing Destruction*, 16.

¹⁹⁶ Rico, *Constructing Destruction*, 17.

¹⁹⁷ Rico, *Constructing Destruction*, 110.

¹⁹⁸ Spennemann and Graham, “The Importance of Heritage Preservation in Natural Disaster Situations,” 996.

¹⁹⁹ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 40.

when it comes to damaged historic structures and difficult decisions of whether to protect them or let them go.²⁰⁰

Hurricane Katrina Recovery of Historic Properties

In response to a terrorist attack regarded as a national disaster by Americans, the September 11th terrorist attacks in 2001, the Bush Administration altered FEMA's priorities. This event redirected disaster management from an "all-hazards" approach to a focus on counter-terrorism that put much less emphasis on planning for natural hazards.²⁰¹ These changes altered the functioning of FEMA, leaving it unprepared to assist in the response to Hurricane Katrina. Due to the extent of Hurricane Katrina, the majority of technical and financial assistance of a major disaster response became the responsibility of the state and local communities. However, the state and local governments' technical knowledge as well as funds were quickly exhausted, and the chaotic response became a disaster in and of itself.²⁰²

Despite the known risks of hurricanes located on the coastlines of the Gulf of Mexico and previous damaging storms, pre-planning for Hurricane Katrina did not occur for New Orleans' historic resources. For many historic buildings and resources, recovery efforts did not reach them until nearly a month after the storm and often NGOs and grassroots organizations were the first responders.²⁰³ FEMA's post-disaster recovery programs after Hurricane Katrina ignored the needs of historic buildings. For example, the blue roof program put tarps on roofs to protect them from the elements; however, houses with historic roofs did not receive this protection and historic

²⁰⁰ Verderber, "The Unbuilding of Historic Neighbourhoods in Post-Katrina New Orleans," 272.

²⁰¹ Olshanky and Johnson, "The Evolution of the Federal Role in Supporting Community Recovery After U.S. Disasters," 297; Waugh Jr. and Streib, "Collaboration and Leadership for Effective Emergency Management," 136.

²⁰² Olshanky and Johnson, "The Evolution of the Federal Role in Supporting Community Recovery After U.S. Disasters," 298; Thomas J. Campanella and David R. Godschalk, "Resilience," in *Oxford Handbook of Urban Planning* (Oxford University Press, 2012), 224; Huret and Sparks, *Explaining the Unexplainable*.

²⁰³ Silverman, "Toward a National Disaster Response Protocol," 501.

buildings sustained further damage.²⁰⁴ The recovery of historic properties by NGOs during Hurricane Katrina highlighted what many in disaster management already knew about post-disaster recovery: previous plans²⁰⁵ and citizen involvement are essential to an effective disaster response.²⁰⁶

Many grassroots organizations such as the NTHP, the American Institute of Architects (AIA), and The Association of Organizations for Community Reform Now (ACORN) came to assist and recover historic structures as well as helping in rescue and recovery.²⁰⁷ These organizations focused on filling the gaps left by local, state, and federal governments by renovating historic housing in the poorest areas of the city. Websites and blogs also formed to document the city's poor management of the recovery of historic buildings. For example, squanderedheritage.com is a grassroots organization that scoured the city, documenting the illegal demolitions taking place in and out of the flood zone.²⁰⁸

With hindsight, local knowledge of building practices and materials would have been helpful for recovering the historic structures in New Orleans. Out-of-town volunteer responders and FEMA were unaware of the significance of historic building methods and materials; responders ripped out or demolished structures because they believed they were beyond repair. Local architects knew that historic structures were easiest to save and these resources embodied the community and cultural practices integral to New Orleans' identity. Often the historic structures with fewer upgrades were in better shape after the flood event because of their

²⁰⁴ Verderber, "The Unbuilding of Historic Neighbourhoods in Post-Katrina New Orleans," 264–65.

²⁰⁵ Campanella and Godschalk, "Resilience," 225; Tomlan and Listokin, *Historic Preservation*, 254.

²⁰⁶ Campanella and Godschalk, "Resilience," 225.

²⁰⁷ Verderber, 264–65.

²⁰⁸ Verderber, 265.

construction from flood resistant materials.²⁰⁹ In New Orleans, historic house design includes walls made of plaster over lath and cypress floorboards; these materials are mildew and rot resistant, appropriate for an area that experiences frequent flooding.²¹⁰ Modern disaster planners can adapt and apply these historic building materials and methods to other historic and modern buildings. The demolition of these buildings represents a loss of historic architectural methods as well as the tools and techniques used to make structures more resilient to future natural hazards.²¹¹

FEMA, the State of Louisiana, and New Orleans were all unprepared to rebuild New Orleans after Hurricane Katrina. New Orleans is one of the earliest US cities to recognize its responsibility to protect historic properties by passing preservation legislation.²¹² In addition to Charleston, New Orleans contains some of the oldest historic districts in the United States;²¹³ however, the response to New Orleans after Hurricane Katrina highlighted a divide between local and professional knowledge. FEMA and other outside agencies involved in the response did not collaborate with local actors causing even more damage to the historic fabric of New Orleans. The participation of the NTHP and other private and public preservation groups were a lifeline to protect the city's historic structures. The collaboration between agencies such as these can lead to better practices and policy for the reconstruction of historic properties after disaster events.²¹⁴ Much like in Charleston after Hurricane Hugo, collaboration between federal experts such as the NPS and FEMA and local experts with knowledge of the community's cultural resources is critical to the disaster management of historic properties. The disastrous federal and local

²⁰⁹ Allen, "Environmental Justice, Local Knowledge, and after-Disaster Planning in New Orleans," 157.

²¹⁰ Allen, "Environmental Justice, Local Knowledge, and after-Disaster Planning in New Orleans," 157.

²¹¹ Rico, *Constructing Destruction*, 72.

²¹² Christoff, "House of the Setting Sun," 5.

²¹³ Christoff, "House of the Setting Sun," 18.

²¹⁴ Christoff, "House of the Setting Sun," 18.

response to Hurricane Katrina also led to major legislative change to federal disaster management. In 2006, Congress passed the Post-Katrina Emergency Management Reform Act (PKEMRA); this legislation amended the Stafford Act and introduced the NDRF.

The funding and organizational changes made to FEMA during the Bush Administration had disastrous effects on the agency's ability to respond to the needs of citizens and their cultural heritage. The Bush Administration ignored established effectual methods for disaster management, such as coordination with other agencies and pre-mitigation actions, resulting in an unorganized response. The Trump Administration has yet to make similar changes to FEMA, but both the administration and FEMA are ignoring the effects of climate change, which could affect their ability to truly assess future hazards and respond to natural disaster events. In addition, both President Bush and Trump have praised the efforts of FEMA and their administration regardless of the ongoing catastrophes in New Orleans after Katrina in 2005 and recent Hurricanes Harvey, Irma, and Maria (2017) in Texas, Florida, Puerto Rico and the Virgin Islands.²¹⁵

Hurricane Sandy Recovery of Historic Properties

Although nowhere near the destruction caused by Hurricane Katrina, Hurricane Sandy brought catastrophic winds and water damage to sites and properties in a majority of the Northeastern United States in October 2012. Most of the damage occurred in New York City and New Jersey, both of which are home to a number of important cultural and historic resources. New Jersey has over 74,000 historic properties and 6,000 archaeological sites while New York State's resources include more than 90,000 properties.²¹⁶ The majority of New Jersey's affected historic properties were on barrier islands and in coastal communities, with some of the worst

²¹⁵ Bloomberg, "Trump's Praise of FEMA Chief Evokes Bush's Katrina Words."

²¹⁶ Federal Emergency Management Agency United States Department of Homeland Security, "Mitigation Assessment Team Report: Hurricane Sandy in New Jersey and New York," November 2013, 6-2, https://www.fema.gov/media-library-data/1386850803857-025eb299df32c6782fdcbb6f69b35b13/Combined_Sandy_MAT_Report_508post.pdf.

damage in Mantoloking's Historic District.²¹⁷ In New York City, Hurricane Sandy inundated 5,700 acres of the New York City parks system causing nearly \$800 million in damage, including damage to park facilities and historic properties.²¹⁸ The storms also impacted federal resources such as The Statue of Liberty National Monument, which includes both Liberty Island and Ellis Island.²¹⁹ Historic properties require special consideration and treatment during disaster recovery. The rushed and sometimes chaotic nature of the recovery process does not always allow for the time, planning, and formal status assessment required for the preservation of historic properties.²²⁰

After Hurricane Sandy, it fell to the heritage professionals to ensure that historic properties received the attention they needed in disaster recovery and to alert local historic preservation commissions as well as SHPO.²²¹ Due to the storm damage, NJ SHPO could not begin fieldwork assessments right away (the first surveys did not take place until the end of November 2012, a month after the storm) but information gathering began immediately after the storm made landfall.²²² Residents could self-report damage through an online portal on SHPO's website;²²³ this tool was useful in initial damage assessments, but the public may not report all damage. For example, if a historic property had easily repaired minor damages, the property owner did not necessarily report it.²²⁴

²¹⁷ "Action Plan Narrative for the Preservation, Stabilization, Rehabilitation, and Repair of Historic Properties," 6.

²¹⁸ The City of New York, "PlaNYC: A Stronger, More Resilient New York," PlaNYC (New York, N.Y., June 11, 2013), 194.

²¹⁹ United States Department of Homeland Security, "Mitigation Assessment Team Report: Hurricane Sandy in New Jersey and New York," 6–10.

²²⁰ Stephanie L. Cherry-Farmer, "Sustained Survival: Challenges and Tools for New Jersey's Historic Resources During Hurricane Sandy Recovery," *Gardenstatelegacy.Com* GSL19 (March 2013), http://gardenstatelegacy.com/files/Sustained_Survival_Cherry-Farmer_GSL19.pdf.

²²¹ Cherry-Farmer, "Sustained Survival"

²²² Hovanic, "Stronger than the Storm?," 75.

²²³ Hovanic, "Stronger than the Storm?," 75.

²²⁴ Cherry-Farmer, "Sustained Survival"

The NJ SHPO utilized Cultural Resource GIS (CRGIS) data to narrow down the areas of potentially-affected historic properties before conducting windshield surveys to delineate affected areas.²²⁵ NJ SHPO and FEMA staff conducted “Pink and Green” windshield surveys to delineate areas where storm damage occurred, but no historic properties were present.²²⁶ The “Pink and Green” windshield surveys were a “very rough and quick way” for FEMA and NJ SHPO staff to apply National Register criteria to a “huge expanse of territory”.²²⁷ More intense surveys and Section 106 review took place in areas where historic properties were present.²²⁸ NJ SHPO staff acknowledged that this was a unique method as other states affected by Hurricane Sandy or other severe storms would typically review applications as they were received.²²⁹ The information gathered from these surveys later informed the Programmatic Agreement NJ SHPO drafted with FEMA for the Unified Federal Review for Hurricane Sandy and future disaster events over the next five years.²³⁰

In New York City, FEMA conducted historic structure surveys with traditional FEMA tagging techniques. Using Green, Yellow, and Red tags, buildings were classified as little or no significant damage (Green), some damage or non-structural damage (Yellow), structural damage and in some cases destroyed (Red).²³¹ The Brooklyn-Queens waterfront is home to many historic buildings, including the Red Hook Houses, one of the New York City Housing Authority’s (NYCHA) first public housing complexes.²³² Along the Brooklyn-Queens waterfront, the percentage of damaged buildings was higher than damaged buildings citywide. The Brooklyn-Queens waterfront contained 93% of yellow and red-tagged buildings, as opposed to 62% in the

²²⁵ Hovanic, “Stronger than the Storm?,” 76.

²²⁶ Cherry-Farmer, “Sustained Survival”; Hovanic, “Stronger than the Storm?,” 76.

²²⁷ Hovanic, “Stronger than the Storm?,” 77.

²²⁸ Cherry-Farmer, “Sustained Survival.”

²²⁹ Hovanic, “Stronger than the Storm?,” 77.

²³⁰ Hovanic, “Stronger than the Storm?” 77; “Programmatic Agreement for the State of New Jersey, Section 106 of the NHPA (February 2013) | FEMA.Gov.”

²³¹ The City of New York, “PlaNYC: A Stronger, More Resilient New York,” 247.

²³² The City of New York, 242.

remainder of the city.²³³ Though efficient and effective for modern buildings, this tagging system does not always work for historic buildings.²³⁴ Quick assessments of 20 minutes or less determine if a damaged structure is dangerous after a disaster event. Many of these buildings, notably the historic structures, need further investigation to determine their actual status. Many can be stabilized, retrofitted, repaired, and/or reconstructed.²³⁵

The lack of local information that affected the recovery of historic structures after Hurricane Katrina also affected recovery efforts after Hurricane Sandy. The SHPO's based their information on their CRGIS systems and existing survey data, some of which were more than 30 years old.²³⁶ For example, the Mantoloking Historic District in NJ had not had a historic resource survey since the 1980's,²³⁷ making it difficult for SHPO to assess what had been damaged because there was not enough recent information regarding what historic buildings met the 50 year age mark for evaluation.

Like Hurricane Katrina, the Hurricane Sandy response also saw the participation of non-profit preservation groups. In New York, Alliance for Response NY participated in disaster response and salvage efforts of historic resources during Hurricane Sandy. Because of their involvement, the New York Community Trust encouraged them to apply for a grant to train a Heritage Response Team for the New York City area. They received the grant, called *Improving Cultural Heritage Emergency Preparedness & Response*, and are working toward developing improved emergency communication within the New York cultural community and training a

²³³ The City of New York, 247.

²³⁴ Donald Friedman, author. 2003. "Structural Triage of Historic Buildings: Combining Safety and Preservation Interests after Disasters." APT Bulletin, no. 1: 34. <https://doi.org/10.2307/1504850>.

²³⁵ Spennemann and Look, "From Conflict to Dialogue", 174.

²³⁶ Hovanic, "Stronger than the Storm?," 81.

²³⁷ Cherry-Farmer, "Sustained Survival"

NYC Heritage Response Team utilizing the American Institute for Conservation Collections Emergency Response Team (AIC-CERT) model.²³⁸

In New Jersey, Preservation NJ (PNJ) and the NJ Historic Trust (NJHT) filled in what roles they could by providing resources to those on the ground.²³⁹ NJHT provided funding for low-impact adaptations to historic homes including floodgates, flood-vents, and the elevation of utilities,²⁴⁰ while PNJ focused on the creation of statewide elevation design standards for historic properties.²⁴¹ In 2016, NJ selected Preservation Design Partnership (PDP) to complete a report to identify potential strategies for historic properties in flood-prone areas including a consistent approach to elevation guidelines across the state. After Hurricane Katrina, Mississippi Development Authority created the “Gold Standard” for the elevation of historic properties in the Gulf Coast region. The NJ DEP provided these elevation standards for historic homeowners along with other disaster preparedness and recovery resources on their website.²⁴² However, these standards do not apply outside of the Gulf Coast region. For instance, the architectural diversity and dense development patterns within NJ make it difficult to apply to the state’s historic resources.²⁴³ At the time of writing, PDP’s elevation project is “in progress” on their website.²⁴⁴

The severity of Hurricane Sandy also highlighted the need to consider the impact of climate change and sea-level rise in reconstruction and mitigation decisions.²⁴⁵ Although

²³⁸ “After Hurricane Sandy: An Action Plan for New York City - VoCA | Voices in Contemporary Art,” October 28, 2013, <http://www.voca.network>.

²³⁹ Hovanic, “Stronger than the Storm?,” 110.

²⁴⁰ Hovanic, 86.

²⁴¹ Hovanic, 92.

²⁴² “NJDEP-Hurricane Sandy Resources Page,” accessed September 2, 2018, <https://www.state.nj.us/dep/special/hurricane-sandy/>.

²⁴³ Cherry-Farmer, “Sustained Survival”

²⁴⁴ “NJ Elevation Guidelines,” accessed July 8, 2018, <http://www.pdparchitects.com/nj-elevation-guidelines/>.

²⁴⁵ FEMA P-942, “Mitigation Assessment Team Report: Hurricane Sandy in New Jersey and New York,” ii.

Hurricane Sandy emphasized existing vulnerabilities within NJ's coastal communities,²⁴⁶ as reconstruction got underway, very few people questioned whether rebuilding should occur in affected areas. This was especially true along the New Jersey coastline, where "Restore the Shore" memorabilia populated fundraising efforts.²⁴⁷ These same attitudes extended to historic and cultural properties. The Atlantic City and Seaside Boardwalks experienced inundation and damage,²⁴⁸ but there was no question of whether to rebuild. In addition to having cultural and historic value, these resources are economic assets to these communities and to the state of New Jersey. For the most part, state and local officials focused on restoring communities to pre-storm conditions with no consideration for the future risk of sea level rise.²⁴⁹ New Jersey's coastal communities located along the Atlantic Coast, Delaware Bayshore, and urban communities along the tidal portion of the Hudson River²⁵⁰ are at higher risk of damage from severe storms and storm surge as sea-level rise increases. Current estimates predict that the relative sea level in New Jersey will rise from 13 to 28 inches by 2050,²⁵¹ endangering the cultural and recreational resources that generate tourism dollars for the state.²⁵² Planning and rebuilding these resources as more resilient to future natural hazards not only protects their cultural value, but also their economic benefits.

²⁴⁶ David M. Kutner, "In Deep: Helping Sandy-Affected Communities Address Vulnerability and Confront Risk" (New Jersey Future, October 2015), 3, <http://www.njfuture.org/wp-content/uploads/2015/10/NJFuture-In-Deep-10-15-WEB.pdf>.

²⁴⁷ Bates, *Superstorm Sandy: The Inevitable Destruction and Reconstruction of the Jersey Shore*, 11.

²⁴⁸ "Action Plan Narrative for the Preservation, Stabilization, Rehabilitation, and Repair of Historic Properties," 2-1 & 2-1.

²⁴⁹ Kutner, "In Deep: Helping Sandy-Affected Communities Address Vulnerability and Confront Risk," 8.

²⁵⁰ NJ Climate Adaptation Alliance, "A Summary of Climate Change Impacts and Preparedness Opportunities for the Coastal Communities in New Jersey" (Rutgers the State University of New Jersey, April 2014), 1, <https://njadapt.rutgers.edu/docman-listener/working-briefs/108-njcaa-coastal-communities/file>.

²⁵¹ NJ Climate Adaptation Alliance, 3.

²⁵² NJ Climate Adaptation Alliance, 5.

At the federal level, Hurricane Sandy did bring attention to the effects of climate change and rising sea levels. During Hurricane Sandy's recovery and reconstruction, President Obama told then FEMA Administrator Craig Fugate, 'we need to start talking about climate change adaptation'.²⁵³ President Obama also signed Executive Order 13632, creating the Hurricane Sandy Rebuilding Taskforce.²⁵⁴ Obama directed the Task Force to deliver a rebuilding strategy for Sandy-affected regions that would promote resiliency in future disaster events and set a precedent for other vulnerable regions of the country.²⁵⁵

Hurricane Sandy recovery efforts highlighted many of the same issues common after other United States disasters such as flood events and hurricanes; that insufficient disaster planning, understanding of existing historic resources, and available finances shape a disaster response.²⁵⁶ However, Sandy also demonstrated that historic preservationists can work together to adapt to the procedural and rehabilitation changes (i.e., elevations of historic houses) necessitated by the future effects of climate change.²⁵⁷ Many preservation organizations like PNJ, NJHT, and Alliance for Response NY had to work with disaster management agencies at the state and federal level to adapt recovery methods with the few resources they had at their disposal.

Hurricane Sandy thrust east coast national parks, national landmarks, New York City, and the Jersey Shore into the larger discourse on climate change and its likely impacts on coastal historic resources. While many residents of the Jersey Shore acknowledged that the increased

²⁵³ "Obama's FEMA Chief."

²⁵⁴ Exec. Order. No. 13632, 77 Fed. Reg. 74341 (December 7, 2012), <https://obamawhitehouse.archives.gov/the-press-office/2012/12/07/executive-order-establishing-hurricane-sandy-rebuilding-task-force>.

²⁵⁵ "The President's Climate Change Action Plan" (The Executive Office of the President, June 2013), 13–14, <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>.

²⁵⁶ Hovanic, "Stronger than the Storm?," 185; Amanda Babson et al., "Chapter 9 Lessons Learned from Hurricane Sandy," in *Coastal Adaptation Strategies Handbook* (National Park Service, 2016), 131, https://www.nps.gov/subjects/climatechange/upload/CASH_FINAL_Document_111016.pdf.

²⁵⁷ Hovanic, "Stronger than the Storm?," 184.

severity of recent storms was most likely due to climate change,²⁵⁸ no one questioned whether they should rebuild in a vulnerable area. Hurricane Sandy also presented an opportunity to prioritize threatened heritage resources and community values in flood-prone areas, creating a greater need for historic preservation. But with limited resources and funding available, historic preservationists did not take advantage of this opportunity.²⁵⁹ In addition to constructing resilient buildings and structures, preservationists and heritage professionals must begin planning stronger disaster and climate change adaptation measures, some of which acknowledge the loss of historic sites and the prioritization of resources for those that can be saved for future generations.²⁶⁰

Conclusion

Disaster planning for historic properties is essential now more than ever. The events of Hurricane Katrina and Hurricane Sandy highlight the need for better collaboration between public and private agencies to ensure the preservation of historic structures located in vulnerable areas. While the response to Hurricane Sandy improved upon collaboration, it still lacked an understanding of what resources were present before the event because of the absence of up-to-date surveys and inventories. This is not an issue unique to climate change planning, but disaster management of historic sites presents an opportunity for regular monitoring and survey of historic properties. Protecting historic resources can help preserve heritage as well as historic knowledge and skills for future generations in addition to protecting valuable economic assets. Cultural and historic heritage are not just buildings, structures, archaeological sites, and landscapes, they also give a sense of place and can encourage healing in a community. Using existing tools such as programmatic agreements, disaster plans, and inventories can help ensure the protection and consideration of these resources in disaster planning, mitigation, and recovery.

²⁵⁸ Hovanic, 94.

²⁵⁹ Hovanic, 88.

²⁶⁰ Hovanic, 183; Babson et al., "Chapter 9 Lessons Learned from Hurricane Sandy," 125.

Beginning this planning process now is important because the preservation community needs to adapt to the reality of the effects of climate change. The Trump Administration also needs to reevaluate their position on climate change and cultural heritage as the costs of hurricane seasons continue to rise. In October 2018, Hurricane Michael impacted Florida and Georgia as the most intense storm in the Florida Panhandle's history. The historic storm also impacted North and South Carolina, two states still recovering from Hurricane Florence in September. The 2017 hurricane season was the most expensive in US history with more than \$200 billion in damage from 17 named storms. At the time of writing, only the US Virgin Island's Mitigation Assessment Team (MAT) report on Hurricanes Irma and Maria was available for review. The report reviews the building codes, standards, and regulations present in the US Virgin Islands as well as the performance of critical facilities such as schools and hospitals during the storms. However, unlike previous MAT reports on Hurricanes Katrina and Sandy, historic buildings were not included in this assessment.²⁶¹ Not only is the Trump Administration's changes affecting climate change planning, they are also unprepared to assist communities in disaster mitigation for their historic properties. In the next chapter, I will discuss the effects of climate change on cultural resources in United States, as well as the need to adapt to these changes.

²⁶¹ United States. Department of the Homeland Security. Federal Emergency Management Agency, "FEMA P-2021 | Mitigation Assessment Team Report: Hurricanes Irma and Maria in the U.S. Virgin Islands | FEMA.Gov," FEMA P-2021, September 24, 2018, v–ix, https://www.fema.gov/media-library-data/1537798612428-1044d3120aac07837e8554871c56ed94/USVI_MAT_Final_9-24-2018_508.pdf.

Chapter 3: Climate Change and Cultural Heritage

In Chapters 1 and 2, I discussed the importance of disaster planning for both historic resources and disaster preparedness of communities in the United States. Many of the tools used in disaster planning, management, and mitigation are also helpful in planning for the effects of climate change on historic resources. The immediate need to plan for climate change is essential because major adaptation strategies to strengthen and retrofit historic properties, as well as policy changes to prepare historic resources for climate change effects take time to implement.²⁶² In addition to adaptation strategies and planning, the uncertainty of climate change may alter the way preservationists and communities view, value, and conserve heritage resources.²⁶³ The heritage community is confronting the uncontrollable effects of climate change and they proactively need to prepare in new and unusual ways, utilizing stakeholders and methods at all levels of government and planning.²⁶⁴ In this chapter, I will review the estimated effects of climate change and their impact on historic properties; I will also discuss some adaptation methods proposed by those in the cultural heritage community to combat these effects. Finally, I will review examples of adaptation methods that have taken place or were proposed after Hurricane Sandy (post October 2012), as well as examples of how climate change can reveal new forms of cultural heritage.

²⁶² Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

²⁶³ Caitlin DeSilvey, *Curated Decay : Heritage beyond Saving* / (University of Minnesota Press, 2017), 9.

²⁶⁴ Cassar, “Sustainable Heritage,” 10; Hall et al., “Climate Change and Cultural Heritage,” 18.

The Potential Effects of Climate Change on Historic Resources

Recent scientific studies have identified that the extreme events most closely associated with climate change are high heat, coastal erosion, flooding, intense precipitation, drought,²⁶⁵ and more frequent wildfires.²⁶⁶ These threats damage historic resources such as archaeological sites, historic buildings, and cultural landscapes²⁶⁷ throughout the United States. Climate change effects are also estimated to be a risk multiplier for environmental changes already taking place. For example, flooding and coastal erosion already occur, but the magnitude, frequency, and the geography of these processes will be affected by climate change.²⁶⁸ Barrier islands as well as historic coastal and tidal river cities such as New York, New Orleans, and Annapolis are already experiencing the impacts of climate change and sea-level rise.²⁶⁹ The scale and nature of the impact of these changes will vary for each location and historic resource.²⁷⁰

Current estimates for sea-level rise from the IPCC are between .3 meters and 1 meter by 2100.²⁷¹ Although there is an uncertainty in the scientific community regarding the rate of the rise,²⁷² there is a consensus about the high likelihood of rising seas, more frequent storms, and increased flooding.²⁷³ Climate change risks currently identified for the historic environment are:

- Flooding and coastal change
- Impacts on high temperatures

²⁶⁵ Cassar, “Sustainable Heritage,” 6; “National Landmarks at Risk (2014),” 1; Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 90; Wagner, Chhetri, and Sturm, “Adaptive Capacity in Light of Hurricane Sandy,” 15.

²⁶⁶ “National Landmarks at Risk (2014),” 1.

²⁶⁷ Hall et al., “Climate Change and Cultural Heritage: Conservation and Heritage Tourism in the Anthropocene,” 11; Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 90; “National Landmarks at Risk (2014),” 1.

²⁶⁸ Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 90; Wagner, Chhetri, and Sturm, “Adaptive Capacity in Light of Hurricane Sandy,” 15.

²⁶⁹ “Sea Level Rise Will Flood Hundreds of Cities in the Near Future,” accessed September 13, 2018, <https://news.nationalgeographic.com/2017/07/sea-level-rise-flood-global-warming-science/>.

²⁷⁰ Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 90; Wagner, Chhetri, and Sturm, “Adaptive Capacity in Light of Hurricane Sandy,” 18.

²⁷¹ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

²⁷² Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 89–90; Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

²⁷³ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

- Risks to water shortages
- Impacts on global food system
- Risks from new pests and diseases²⁷⁴

Some of these risks clearly have a direct impact on the historic environment; others, such as water shortages and pests, are indirect risks but can still potentially impact the historic resources.²⁷⁵

Water shortages can cause drought, which can lead to wildfires, and insect infestations can damage historic collections.²⁷⁶ Flooding and coastal change caused by sea-level rise and more frequent and severe cyclonic storms threaten the survival of historic buildings in low-lying areas and coastlines.²⁷⁷ In addition, storm surge causes structural damage around supporting piers and foundations because of the force of high-energy water and waves. A strong storm surge can wash an entire building away, as demonstrated by recent Hurricanes Florence and Michael in 2018,²⁷⁸ and coastal erosion compromises archaeological sites and cultural landscapes.²⁷⁹

The latest IPCC report released in October 2018 urged unprecedented global action to decrease temperatures within the next decade, but climate scientists criticized the report for its lack of emphasis on climate change's contributions to extreme weather events.²⁸⁰ Climate change is projected to cause unusual and more variable weather patterns. This includes increased rainfall, more intense hurricanes, and winter storms with higher wind speeds, lower barometric pressure,

²⁷⁴ Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 95.

²⁷⁵ Cassar, "Sustainable Heritage," 6; Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 42; Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 95.

²⁷⁶ "National Landmarks at Risk (2014)," 54–55.

²⁷⁷ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 41.

²⁷⁸ "Here's How That One Mexico Beach House Survived Hurricane Michael," The Weather Channel, accessed October 17, 2018, <https://weather.com/news/news/2018-10-16-mexico-beach-home-survives-hurricane-michael>.

²⁷⁹ Horowitz, 42.

²⁸⁰ Scott Waldman News E&E, "New Climate Report Was Too Cautious, Some Scientists Say," Scientific American, accessed October 17, 2018, <https://www.scientificamerican.com/article/new-climate-report-was-too-cautious-some-scientists-say/>.

and higher precipitation amounts.²⁸¹ Repetitive flooding caused by storms can lead to loss of life, property damage, environmental degradation, economic disruption, as well as cause primary and secondary damage to historic buildings.²⁸² Flooding creates loss of stratigraphic integrity and unstable subsoil, ground heave and subsidence, as well as penetrating damp that causes physical changes to porous traditional building materials.²⁸³ Foundation walls are at risk of collapsing from inundation in the basement and flooding above the first floor can cause significant and costly repairs.²⁸⁴

Another climate change risk to historic resources is a shift to higher temperatures that can increase the risk of extreme heat.²⁸⁵ Seasonal overheating in buildings can drive up the use and cost of mechanical cooling systems that can cause power outages and loss of climate control for historic buildings and collections.²⁸⁶ Warmer air holds more water, increasing precipitation in rain and snowstorms. While too much water can cause catastrophic flooding, too little water can lead to drought. In already arid areas, these conditions can cause wildfires, such as the 2018 Thomas fire and the Mendocino Complex fire in northern California.²⁸⁷ Wildfires kill vegetation and with increased precipitation, the soil absorbs more rainwater. Without vegetation to hold the soil together, erosion and mudslides can occur. Wildfires can also chemically change soil causing it to repel water and lead to flooding that can affect historic structures.²⁸⁸ Tackling the climate change is a multifaceted issue “to adapt to uncontrolled change”²⁸⁹ and future conservation practices in

²⁸¹ Cassar, “Sustainable Heritage,” 6; Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 41.

²⁸² Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 42.

²⁸³ Cassar, “Sustainable Heritage,” 6.

²⁸⁴ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 42.

²⁸⁵ Cassar, “Sustainable Heritage,” 6; “National Landmarks at Risk (2014),” 53.

²⁸⁶ Cassar, “Sustainable Heritage,” 6.

²⁸⁷ “Mapping the Mendocino Complex Fire,” Washington Post, accessed September 3, 2018, <https://www.washingtonpost.com/graphics/2018/national/mendocino-fire/>.

²⁸⁸ “National Landmarks at Risk (2014),” 54–55.

²⁸⁹ Cassar, “Sustainable Heritage,” 10; Hall et al., “Climate Change and Cultural Heritage,” 18.

the United States need to focus on sustainability principles for historic preservation and disaster management.

Adapting Cultural Heritage to Climate Change

Many studies on the effects of climate change on cultural heritage focus on adaptation methods that minimize climate change effects.²⁹⁰ These measures minimize damage related to flooding, storm surges, and erosion on tidal shorelines, all of which sea-level rise is exacerbating.²⁹¹ There is also a need to prioritize heritage in areas that are most at risk,²⁹² such as Alaska and other areas of the Arctic as well as sites on the coast of the Mediterranean.²⁹³ For some historic resources, adaptation actions may not be feasible due to the high cost of maintenance and the rapid rate of the deterioration of sites, some sites may be left to purposely to decay.²⁹⁴ In the United States, NPS Park Managers are currently prioritizing the most vulnerable archaeological sites by documenting them before they are lost.²⁹⁵

As sea-level rise rates vary based on the location and type of historic resource, preservationists and disaster managers need to prioritize climate change adaptation strategies based on present hazards and available resources. Three types of adaptation strategies for sea-level rise proposed by Ann Horowitz in her study on disaster planning are Hard, Soft, and Non-

²⁹⁰ Cassar, "Sustainable Heritage," 6; Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 10; Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 90; Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 41.

²⁹¹ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 41.

²⁹² Horowitz, 42; Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 90.

²⁹³ Hollesen et al., "Climate Change and the Deteriorating Archaeological and Environmental Archives of the Arctic," 574; Lena Reimann et al., "Mediterranean UNESCO World Heritage at Risk from Coastal Flooding and Erosion Due to Sea-Level Rise," *Nature Communications* 9, no. 1 (October 16, 2018): 2, <https://doi.org/10.1038/s41467-018-06645-9>.

²⁹⁴ Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 11; Heathcote, Fluck, and Wiggins, "Predicting and Adapting to Climate Change," 90.

²⁹⁵ Caffrey and Beavers, "Planning for Impact of Sea-Level Rise on U.S. National Parks," 11.

structural.²⁹⁶ Hard adaptation strategies are engineered, technical solutions that are large scale and expensive. They involve fortifying large areas of land from flooding, storm surge, and inundation by using physical barriers. However, barriers are difficult and expensive to build and maintain; they can also cause damage to the surrounding natural and cultural environment.²⁹⁷ Soft adaptation strategies use natural materials as engineered structures. These include beach nourishment, dune building, and wetland reclamation. Natural materials such as soil, sand, and vegetation absorb rainfall and storm surge. These techniques also require large areas of land as well as frequent and expensive maintenance.²⁹⁸ Non-structural adaptations accommodate the built environment to sea-level rise. In comparison to the first two adaptation strategies, non-structural are not large-scale measures and they typically involve organizational policies and strategies. These include infrastructure improvements, building and land elevation, zoning ordinances and building codes as well as building retrofit programs.²⁹⁹

Building elevation can be useful in coastline regions affected by flooding and storm surges. This method was used after Hurricane Katrina by elevating houses with concrete or steel piers. However, elevation is expensive and can affect the integrity of historic districts and properties. One suggestion from preservationists is for historic districts to remain consistent with elevation heights if they choose this method. The architectural design and elevation materials should also harmonize with the historic structures as much as possible.³⁰⁰ In New Jersey, local historic commissions and committees are beginning to create guidelines for elevations; the Beach Haven Historic Preservation Advisory Committee included rules such as covering the new foundations with either half-brick or latticework.³⁰¹ A more practical option is routine building

²⁹⁶ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 43.

²⁹⁷ Horowitz, 43.

²⁹⁸ Horowitz, "Planning before Disaster Strikes: An Introduction to Adaptation Strategies," 44.

²⁹⁹ Horowitz, 43.

³⁰⁰ Horowitz, 45.

³⁰¹ Hovanic, "Stronger than the Storm?," 99.

maintenance as a way of dry flood proofing.³⁰² This includes keeping windows and doors in good repair, weather proofing historic doors and windows, and maintenance of foundation walls. Elevation can be expensive, but flood proofing is a more reasonably priced adaptation method.³⁰³ Throughout the United States, communities, preservationists, and disaster managers should start planning as soon as possible to determine what adaptation methods are most appropriate for their community and historic resources.

Non-structural adaptations should focus on historic preservation practices that are sustainable and environmentally responsible.³⁰⁴ Recycling historic buildings and their irreplaceable materials uses less energy and creates less pollution than generating new products.³⁰⁵ Even energy efficient modern buildings can take up to 80 years to “pay off” the climate impacts of their original construction. Preserving and retrofitting historic buildings is sustainable and climate-friendly because they have already “paid off” their construction carbon debt.³⁰⁶ Historic buildings were built with natural cooling and heating materials and tend to rate higher on energy use surveys in US cities such as Boston and New York. In Boston, the Boston Preservation Alliance and the Association of Preservation Technology Northeast are focusing on methods to fortify and prevent deterioration in historic buildings throughout the city.³⁰⁷ Conservation of historic buildings creates new jobs and vocational training opportunities as well as the reutilization of traditional materials and techniques.³⁰⁸

³⁰² Horowitz, 45.

³⁰³ Horowitz, 47.

³⁰⁴ Cassar, “Sustainable Heritage,” 8.

³⁰⁵ Cassar, 6–7.

³⁰⁶ Max Page. 2016. “Preservation and Sustainability.” In *Why Preservation Matters*, 110. New Haven: Yale University Press.

³⁰⁷ “Historic Preservation Forum Addresses Impacts of Climate Change,” Boston Preservation Alliance, accessed October 17, 2018, <https://bostonpreservation.org/news-item/historic-preservation-forum-addresses-impacts-climate-change>.

³⁰⁸ Cassar, 6.

Adaptive climate change measures need to shift focus away from risk management to preparedness and mitigation for future damage.³⁰⁹ Current United States engineering practices are based on 100-year events.³¹⁰ Utilizing knowledge of past events to anticipate extreme events is now an outdated method as climate change heavily alters nearly all hazards, leaving many communities unprepared for unexpected changes.³¹¹ As of now, 82% of the US population lives in a community with a hazard mitigation plan, integrating climate change planning for historic preservation into these hazard mitigation plans is essential.³¹²

For global cultural heritage, climate change policy work focuses on identifying high-risk sites using the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites (WHS) at Risk list.³¹³ The UNESCO Climate Change Initiative aims to help member states adapt and mitigate the effects of climate change, assess the risks of natural hazards due to climate change and to monitor the effects of climate change on UNESCO WHSs. The initiative hopes to decrease the effects of climate change by promoting the sustainable use of renewable energy sources.³¹⁴ At the time of writing, only one US WHS is on UNESCO's At Risk List, Everglades National Park in Florida.³¹⁵ As a natural heritage site, the Everglades are

³⁰⁹ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21.

³¹⁰ "National Landmarks at Risk (2014)," 54; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21.

³¹¹ "National Landmarks at Risk (2014)," 54; Stults, "Integrating Climate Change into Hazard Mitigation Planning," 30; Wagner, Chhetri, and Sturm, "Adaptive Capacity in Light of Hurricane Sandy," 21.

³¹² Stults, 30.

³¹³ David Harvey and James A. Perry, eds. *The Future of Heritage as Climates Change: Loss, Adaptation and Creativity*. Key Issues in Cultural Heritage. New York, NY: Routledge, 2015, 10.

³¹⁴ UNESCO World Heritage Centre, "Climate Change and World Heritage," UNESCO World Heritage Centre, accessed August 11, 2018, <https://whc.unesco.org/en/climatechange/>.

³¹⁵ UNESCO World Heritage Centre, "UNESCO World Heritage Centre - List of World Heritage in Danger," UNESCO World Heritage Centre, accessed October 17, 2018, <https://whc.unesco.org/en/danger/>.

endangered from the effects of sea-level rise caused by climate change.³¹⁶ The number of US sites on UNESCO's list may grow as the Trump Administration has promised to leave UNESCO³¹⁷ and continues to reverse climate change policies. The United States' exit from UNESCO may cause other nations to follow suit,³¹⁸ putting more WHS at risk. Another international cultural heritage organization, the International Council on Monuments and Sites (ICOMOS), passed a climate change resolution in December 2017. The resolution on Climate Change and Cultural Heritage recognizes the growing threat of climate change and explicitly states ICOMOS' support for the Paris Agreement. In addition, it establishes a working group to develop strategies and respond to climate change for cultural heritage.³¹⁹

Proactive approaches to climate change require a unified approach from the cultural heritage community as well as a long-term vision for climate change adaptation strategies for historic buildings and sites.³²⁰ In the United States, after Hurricane Sandy brought climate change into the national conversation, the focus to rebuild was on resiliency projects. Instead of rebuilding to pre-storm conditions, recovery teams and funding focused on rebuilding for the next disaster event. Climate change resilience should be positioned as a national priority again. With the effects of climate change already underway in the US, government agencies, park managers,

³¹⁶ UNESCO World Heritage Centre, "Impact of Climate Change on Marine Sites Examined at COP22," UNESCO World Heritage Centre, accessed October 17, 2018, <https://whc.unesco.org/en/news/1588/>.

³¹⁷ "Trump Is Pulling the U.S. out of UNESCO. The Bigger Pattern Is the Problem. - The Washington Post," accessed October 17, 2018, https://www.washingtonpost.com/news/monkey-cage/wp/2017/10/16/trump-is-pulling-the-u-s-out-of-unesco-the-bigger-pattern-is-the-problem/?utm_term=.268021d8cf12.

³¹⁸ "Trump Is Pulling the U.S. out of UNESCO".

³¹⁹ Kelsey Mullen, "ICOMOS Passes Resolution on Climate Change and Cultural Heritage," accessed September 3, 2018, <http://www.usicomos.org/icomos-passes-resolution-on-climate-change-and-cultural-heritage/>.

³²⁰ Hall et al., 18.

archaeologists, historic preservationists, engineers, and architects need to start planning in a collaborative manner.³²¹

Adaptation Measures for Historic Resources after Hurricane Sandy

Following Hurricane Sandy, the NPS, FEMA, as well as state and local historic preservation agencies, adapted historic resources to make them more resilient to the future impacts of climate change and natural hazards. Some of these adaptations included the minor changes such as dry and wet flood proofing measures as well as major changes such as the elevation of historic homes. The NPS saw Hurricane Sandy recovery operations as an opportunity to incorporate climate change adaptation features in national parks and their built facilities.³²² In fact, initially the Hurricane Sandy Rebuilding Task Force required that federal facilities receiving recovery funding rebuild critical infrastructure to FEMA's Advisory Base Flood Elevations (ABFE) standards plus an additional foot or two. After new floodplain data was available, FEMA increased the ABFE standard to two or three feet above the ABFE.³²³ The NPS and preservationists must adhere to the Secretary of the Interior's Standards for the Restoration of Historic Properties to protect historic structures such as the Statue of Liberty in place as well as maintain their historic integrity. Protecting historic resources in place also maintains their vulnerabilities and creates opportunities for creative adaptation measures if the resources are available.³²⁴

After Hurricane Sandy, both Liberty and Ellis Island closed to the public as repairs were made. Sandy's storm surge caused massive flooding on both islands, but the damage to Ellis Island's facilities was more extensive. Water levels reached 11 feet on Ellis Island, windows were

³²¹ "National Landmarks at Risk (2014)," 3.

³²² Babson et al., "Chapter 9 Lessons Learned from Hurricane Sandy," 122.

³²³ Babson et al., 127.

³²⁴ Babson et al., 128.

broken from the storm, mud lay on top of computer servers, and the new HD video kiosks displaying immigrant stories throughout the museum lost power.³²⁵ The Main Immigration building's flooded basement housed the museum's HVAC, electricity, mechanical, sewage, and fire suppression systems.³²⁶ Even before Hurricane Sandy the utilities were vulnerable to flooding because they predated the National Flood Insurance Program³²⁷ (1968) and were positioned below the Base Flood Elevation.

After Hurricane Sandy, the recovery team worked to rebuild Ellis Island more resilient to future climate change effects and severe storms. This resulted in a massive recovery project that cost \$59 million dollars. The ductwork from the HVAC system was completely ripped out and rebuilt. The recovery team also added 3 feet to the 100-year flood level on Ellis Island to account for future sea level rise.³²⁸ The integrity of Ellis Island's historic character regulated by the Secretary of Interior's Standards complicated these major changes.³²⁹ The recovery teams used creative methods to preserve the historic character of the Immigration Museum and its exhibits while improving the resiliency of the Island's utilities. They built 14-foot platforms for the key infrastructure on the first floor to keep the electrical systems out of harm's way above the 100-year flood level.³³⁰ To preserve the historic appearance of Ellis Island they also built out walls and creatively used exhibits to hide electrical equipment.³³¹

Other creative resilience building alterations and hard adaptation measures include the hazard mitigation changes proposed for NYCHA's Red Hook Houses in Brooklyn. The Red

³²⁵ Rich Goldstein, "How Ellis Island Survived Hurricane Sandy," *The Daily Beast*, May 8, 2015, sec. arts-and-culture, <https://www.thedailybeast.com/articles/2015/05/08/how-ellis-island-survived-hurricane-sandy>.

³²⁶ FEMA P-942, "Mitigation Assessment Team Report: Hurricane Sandy in New Jersey and New York," 2013. 6-10

³²⁷ FEMA P-942, 6-10.

³²⁸ "How Urban Resilience Protects Against Superstorms," accessed December 2, 2017, <https://www.autodesk.com/redshift/urban-resilience/>.

³²⁹ Goldstein, "How Ellis Island Survived Hurricane Sandy."

³³⁰ "How Urban Resilience Protects Against Superstorms."

³³¹ Goldstein, "How Ellis Island Survived Hurricane Sandy."

Hook Houses were built in two phases, in 1939 and 1954,³³² and are among the city's first public housing projects.³³³ Today, the Red Hook Houses are the largest public housing development in Brooklyn. The campus is situated on 47.5 acres in a "Tower-in-the-Park" setting with green spaces and wide walkways in between the apartment buildings (Figure 3.1).³³⁴ In November 2016, NY SHPO determined that the Red Hook Houses were a NRHP-eligible district based on their status as one of the city's first public housing projects and the unique use of the "Tower-in-the-Park" setting; FEMA later agreed with this determination.³³⁵ During Hurricane Sandy, heavy rain and storm surge flooded the entire campus between 6 inches and 7 feet. Floodwaters inundated the facilities through exterior doors, windows, and ventilation openings, leaving residents without power for more than two weeks. NYCHA, along with a contracted architectural firm, Kohn Pederson Fox, designed a district-wide flood mitigation proposal and submitted it for FEMA funding approval.³³⁶



Figure 3.1: Kohn Pederson Fox, The Red Hook Houses Campus, NYCHA Red Hook Houses Sandy Resiliency & Renewal Program, <https://www.kpf.com/projects/nycha-red-hook-houses>, (accessed July 2, 2018).

³³² Brock Giordano and Lara Olinger, "NYCHA Red Hook Houses, Hazard Mitigation Package," October 2, 2017, 1.

³³³ The City of New York, "PlaNYC: A Stronger, More Resilient New York," 247.

³³⁴ Giordano and Olinger, "NYCHA Red Hook Houses, Hazard Mitigation Package," 1.

³³⁵ Giordano and Olinger, 2.

³³⁶ Giordano and Olinger, 2.

The hazard mitigation proposal for the Red Hook Houses included the construction of two new cogeneration plants (Figures 3.2 & 3.3) to provide water and power to the campus, dry flood proofing to each building, basement flood doors, and raised earthen podiums or “lily pads”.³³⁷ The new cogeneration plants will help keep the campus powered in the event of another severe storm or disaster event. To ensure that the proposed construction meets the Secretary of the Interior’s recommendations for new construction, the plants will be located on the east and west periphery of the complex (which is also strategically located outside the flood zone), minimizing the visual impact on the historic district. The new plants will also be constructed using specific materials on the façade, which delineate them from the historic built environment but also harmonizes with the extant built environment.³³⁸



Figure 3.2: Kohn Pederson Fox, West Cogeneration Plant, The Red Hook Houses Campus NYCHA Red Hook Houses Sandy Resiliency & Renewal Program, <https://www.kpf.com/projects/nycha-red-hook-houses>, (accessed July 2, 2018).

³³⁷ Giordano and Olinger, 2.

³³⁸ Giordano and Olinger, 3.



Figure 3.3: Kohn Pederson Fox, East Cogeneration Plant, The Red Hook Houses Campus NYCHA Red Hook Houses Sandy Resiliency & Renewal Program, <https://www.kpf.com/projects/nycha-red-hook-houses>, (accessed July 2, 2018).

One of the more creative adaptation measures within the Red Hook Houses mitigation proposal are the lily pads. Within the Red Hook Houses' interior courtyards, NYCHA and Kohn Pederson Fox intend to use earthen fill to raise the space to act as a natural flood barrier for the entrances to the buildings. The courtyards will still serve as leisure and play areas for tenants, maintaining the "Tower-in-the-Park" setting that makes the Red Hook Houses historically-significant.³³⁹ This adaptation measure maintains the historic value of the NRHP-eligible property while still making it resilient to future natural hazards.

While the Red Hook Houses mitigation project is still under review by FEMA, Hurricane Sandy also brought up questions of how to rebuild historic homes to withstand future storm damage. Modern building codes and zoning laws require properties to be raised above the BFE in flood zones.³⁴⁰ However, after Hurricane Sandy, many residents began to challenge the contradictory nature of NFIP. Historic homes are exempt from the BFE requirements to maintain their historic integrity but then must pay higher insurance premiums because they are not

³³⁹ Giordano and Olinger, 3.

³⁴⁰ Cherry-Farmer, "Sustained Survival."

compliant.³⁴¹ In Freeport Long Island, a homeowner raised his historic house 13 feet after Hurricane Sandy (Figures 3.4 & 3.5), so he can pass it down to his children.³⁴² When property owners raised their homes in a NJ historic district however, there were challenges to the elevated home's contributing status. For example, an English-style cottage (Figure 3.6) in Cape May's historic district was threatened with a downgrade in status from key or contributing structure after they elevated their house to fit new floodplain regulations.³⁴³ With the onset of increasingly severe weather events and sea-level rise caused by climate change, concessions may have to be made for the elevation of historic properties in order to preserve their continued existence for future generations.³⁴⁴



Figures 3.4 & 3.5: FEMA, Freeport, Long Island house before and after elevation, Homeowner elevates Historic House, <https://www.fema.gov/media-library/assets/videos/82505>, (accessed July 2, 2018).

³⁴¹ Hovanic, "Stronger than the Storm?," 80.

³⁴² "Homeowner Elevates Historical House | FEMA.Gov," accessed July 7, 2018, <https://www.fema.gov/media-library/assets/videos/82505>.

³⁴³ Jack Fichter, "Should Raised Home Lose Status?," *Cape May Star and Wave*, December 2, 2015, http://starandwave.com/CM_A1_12-2-15.pdf.

³⁴⁴ Cherry-Farmer, "Sustained Survival."

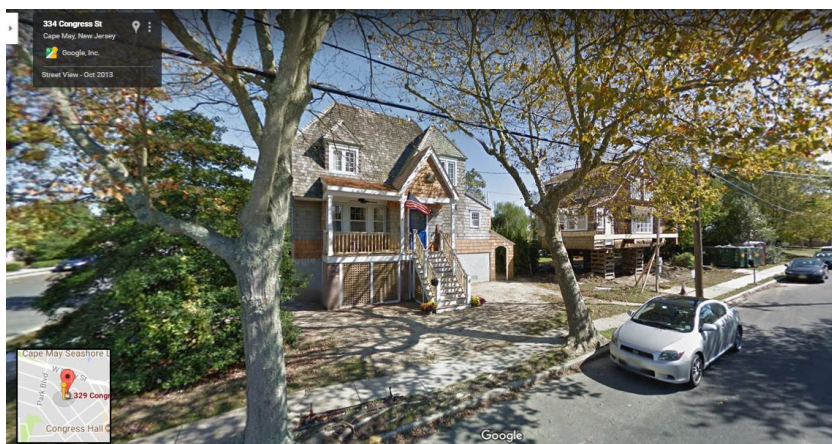


Figure 3.6: Elevated English-style cottage in Cape May, NJ as of 2013, Google Maps, <https://www.google.com/maps/place/329+Congress+St,+Cape+May,+NJ+08204/@38.9329991,-74.9272545,3a,75y,90h,90t/data=!3m6!1e1!3m4!1sq29qe6BsVMlWH9ZziSGDdg!2e0!7i13312!8i6656!4m5!3m4!1s0x89bf548c80a44b0d:0xd9fc27e2c5491578!8m2!3d38.9330649!4d-74.9270197>, (accessed July 2, 2018).

Hurricane Sandy highlighted the vulnerability of many historic resources, some as well known as Ellis Island and others as small as a cottage in a local historic district. Historic built resources must be protected in place, limiting the adaptation measures historic preservationists can make that will not disturb the building's historic integrity. However, if the entire historic district is underwater because of rising sea levels, hard adaptation measures for the effects of climate change will not protect the buildings from inundation.³⁴⁵ As these historic building alterations and elevations are under review and underway, other cultural heritage scholars have found a different way of looking at the potential effects of climate change on cultural heritage.

Embracing the effects of Climate Change

While climate change effects clearly pose a threat to cultural heritage, it may also present opportunities. Droughts can expose cropmarks that lead to the discovery of unknown

³⁴⁵ Hovanic, "Stronger than the Storm?," 183.

archaeological sites, and coastal erosion can reveal hidden sites.³⁴⁶ Shifting currents can reveal shipwrecks and submerged landscapes, and the warmer weather presented by climate change can also increase heritage tourism.³⁴⁷ However, increased tourism can also cause more issues involved with managing tourism at heritage sites and protecting sensitive sites from increased foot traffic. Heritage assets can also teach us how to adapt to changing climates by studying how past human populations adapted to climate and environmental change. This includes using traditional building materials resistant to flood damage and studying patterns of resettlement as well as past land use in floodplains.³⁴⁸

The way preservationists think about heritage sites will need to embrace some climate change effects as positive and necessary for prioritization of heritage resources and loss of sites.³⁴⁹ New models of heritage that incorporates loss and change are already being adopted. For example, in Dunwich Suffolk, UK, heritage sites are allowed to decay.³⁵⁰ This new process recognizes that changes to the natural environment affect human society and challenges traditional methods of preservation and conservation.³⁵¹ As preservation and conservation methods change in reaction to climate change, other forms of heritage are being revealed by its effects.

In July of 2018, a photographer used a drone to document known archaeological sites in County Meath, Ireland. While flying over an unremarkable field, he saw a perfect circle imprinted in the drought-ridden crops (Figure 3.7). The photographer consulted with local archaeologists and confirmed the circle marked a previously unknown henge approximately 4,500

³⁴⁶ “In Ireland, Drought and a Drone Revealed the outline of an Ancient Henge,” NPR.org, accessed July 17, 2018, <https://www.npr.org/2018/07/13/628905864/in-ireland-drought-and-a-drone-revealed-the-outline-of-an-ancient-henge>.

³⁴⁷ Heathcote, Fluck, and Wiggins, “Predicting and Adapting to Climate Change,” 97.

³⁴⁸ Heathcote, Fluck, and Wiggins, 97.

³⁴⁹ Harvey and Perry, *The Future of Heritage as Climates Change*, 10.

³⁵⁰ Harvey and Perry, *The Future of Heritage as Climates Change*, 11.

³⁵¹ DeSilvey, *Curated Decay*, 9-10.

years old. During the late Neolithic period, this henge was constructed of wood; once the wood rotted away, the holes they once stood in filled with organic material, giving the crops a little more water. During normal weather patterns, the difference between these crops and the rest of the field is undetectable; however, Ireland was experiencing a heat wave and dry spell, making these healthier crops stand out in the shape of the former henge and current archaeological site.³⁵²



Figure 3.7: Anthony Murphy, Drone footage captures outline of Ancient Henge, NPR, <https://www.npr.org/2018/07/13/628905864/in-ireland-drought-and-a-drone-revealed-the-outline-of-an-ancient-henge>, (accessed July 13, 2018).

Archaeological excavations can also offer information about historic natural disasters that may occur in the future. Archaeologists in Japan knew that tsunamis on the scale of the 2011 tsunami happened in the past and would happen again.³⁵³ Similarly, archaeological excavations along the Northwest Coast of Oregon and Vancouver uncovered evidence of repeated earthquakes that led to the burial of prehistoric Native American settlements.³⁵⁴ While the archaeological record of natural disasters is not a direct warning of potential hazards from previous generations, it can yield information about the scale of disasters and environmental changes that may occur again and how to prepare for them.

³⁵² “In Ireland, Drought And A Drone Revealed The Outline Of An Ancient Henge.”

³⁵³ Katsuyuki Okamura et al., “The Great East Japan Earthquake and Cultural Heritage: Towards an Archaeology of Disaster,” *Antiquity* 87, 2013 (2013): 261-262.

³⁵⁴ Rick Minor and Wendy C. Grant, “Earthquake-Induced Subsidence and Burial of Late Holocene Archaeological Sites, Northern Oregon Coast,” *American Antiquity* 61, no. 4 (October 1996): 777.

After Hurricane Maria impacted Puerto Rico in 2017, some communities reclaimed historic resources including bridges, cisterns, and wells for use while awaiting recovery efforts. Others shared historic documents detailing how Puerto Rico survived previous disasters and ancient farming strategies for food production. In contrast to reclaimed forms of tangible heritage, Puerto Rico is losing its intangible heritage in the exodus of people leaving the island after the storm; many of the storm's casualties were elders who can no longer pass down their intangible traditions.³⁵⁵ Hard, soft, and non-structural adaptation measures focus on the preservation of tangible heritage, but methods are also needed for the preservation of intangible heritage.

Historic preservation is not a profession that acknowledges the deliberate loss of historic sites, although it is possible to look beyond loss and conceive other forms of material change.³⁵⁶ Just because a historic structure is decaying, it does not threaten the meaning of the structure; in fact, the structure's decay may have its own relation to the past.³⁵⁷ Some form of change in heritage objects may help maintain a connection to the past.³⁵⁸ Cultural heritage needs to be open to the processes by which things "grow, change, rejuvenate, collapse, and decay" and the new meanings and values produced along the way.³⁵⁹

Conclusion

As the historic preservation and cultural heritage community adapt to the uncertain daunting threat of climate change, they must also plan and mitigate for the effects of climate change. Some efforts have already been made on major historic resources in the Northeast United States such as Ellis Island and the Red Hook Houses, but these climate adaptation projects are

³⁵⁵ Isabel Rivera-Collazo, "Grassroots Activism and Catastrophes: The Case of Cultural Heritage and Hurricane Maria in Puerto Rico," *SAA Archaeological Record* 18, no. 1 (January 2018): 22.

³⁵⁶ DeSilvey, *Curated Decay*, 9.

³⁵⁷ DeSilvey, 3 & 5.

³⁵⁸ DeSilvey, 5.

³⁵⁹ DeSilvey, 9.

only the beginning. The historic preservation community cannot save all resources and must evaluate and prioritize the historic values they want to preserve and plan for those that may be lost. While some scholars are embracing what could be positive changes brought on by climate change, others are making adaptations and recording vulnerable sites. Because the Trump Administration does not support cultural heritage and denies the existence of human-induced climate change, the historic preservation community must be the advocates for historic resources in this fight against “uncontrolled change”.³⁶⁰

³⁶⁰ Cassar, “Sustainable Heritage,” 10; Hall et al., “Climate Change and Cultural Heritage,” 18.

Chapter 4: Changes under the Trump Administration

The impacts of climate change are already underway as the 2017 Hurricane Season's six major storms are likely to be the most expensive weather and climate disaster for a single year in the United States.³⁶¹ Climate change is increasing the frequency, intensity, and severity of natural hazards. Rebuilding after the 2017 and 2018 hurricane seasons should not just restore historic structures and buildings to pre-storm conditions, disaster managers and preservationists must rebuild historic resources to be more resilient to future hazards and climate change effects.³⁶² Despite scientific, professional, and public concern about climate change, the Trump Administration has repeatedly rejected the scientific consensus on anthropogenic climate change. Dismissing it as a hoax,³⁶³ the current administration claims that the Obama Administration's climate change and environmental policies were a burden to the national economy.³⁶⁴ By cutting funding to environmental agencies, climate research organizations, and barring the release of climate change research, the current administration is leaving scientists, policy makers, preservationists, and communities vulnerable to the economic and social costs of climate change.

In the following chapter, I will review what climate change legislation, executive orders, and plans the Obama Administration put in place. I will then discuss what changes the Trump Administration has made to these laws, executive orders, and plans as well as the potential effects of these changes. I will also review other actions the administration has taken to undermine climate change mitigation and research for both cultural heritage and climate change planning. This chapter will review how some of the changes have already affected disaster recovery with a

³⁶¹ Andrew Freedman, "Memo to Trump: Climate Change Could Cost the U.S. Government Trillions," *Mashable.Com*, October 24, 2017.

³⁶² "Obama's FEMA Chief."

³⁶³ Jacob Darwin Hamblin, "Access Denied: The Continuing Challenge to Environmental Sciences in the Trump Era," *ENVIRONMENTAL HISTORY* 23, no. 1 (January 2018): 164.

³⁶⁴ Michael Greshko et al., "A Running List of How Trump Is Changing the Environment," *National Geographic News*, August 23, 2017, <http://news.nationalgeographic.com/2017/03/how-trump-is-changing-science-environment/>.

brief discussion of the Trump Administration's response to the 2017 hurricane season and other recent climatic events. Finally, I will discuss the efforts of state lawmakers and "rogue" federal government employees to combat these changes.

The Obama Administration's Environmental and Climate Change Legislation

Although the scientific community has studied some of the effects of human-induced climate change for over 50 years, the United States has only passed climate change-driven legislation within the last two decades.³⁶⁵ By contrast, international efforts took place earlier; the World Meteorological Organization and the United Nations Environmental Programme established the IPCC in 1988 to assess the scientific, technical, and socioeconomic information necessary to understand the risks of human-induced climate change.³⁶⁶ It was not until the Obama Administration (2008-2016) that the US made a more concrete commitment to directly combat the human-induced effects of climate change.

Shortly after his election in 2008, President Obama promised that his presidency would mark a new chapter in the United States' leadership on climate change to strengthen the nation's security and create new jobs.³⁶⁷ In 2009, President Obama pledged to reduce the United States' greenhouse gas emissions to 17% below 2005 levels by 2020.³⁶⁸ To accomplish this, President Obama signed Executive Order 13514, which mandated federal agencies to prioritize greenhouse gas (GHG) emission management and climate change adaptation. The mandate directed each

³⁶⁵ "United States of America," *Grantham Research Institute on Climate Change and the Environment*

³⁶⁶ Le Treut et al., "Historical Overview of Climate Change." in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press, 2007), 118, <https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter1.pdf>.

³⁶⁷ Graciela Kincaid and J. Timmons Roberts, "No Talk, Some Walk: Obama Administration First-Term Rhetoric on Climate Change and US International Climate Budget Commitments," *Global Environmental Politics* 13, no. 4 (November 2013): 41, https://doi.org/doi:10.1162/GLEP_a_00197.

³⁶⁸ "The President's Climate Change Action Plan," 6.

agency to establish an agency-wide Climate Change Adaptation Policy and Mandate by 2011.³⁶⁹ FEMA's Adaptation Policy included procedures such establishing partnerships with other federal, state and local agencies, tribal and territorial partners, NGOs, private organizations, academia, and the international community to develop best practices regarding climate change adaptation.³⁷⁰ Partnerships like this ensure that planning agencies are sharing the most up-to-date climate information and utilizing their resources towards a sustainable response. For fiscal years 2008 to fiscal year 2013, climate change activities accounted for \$77 billion of federal agency budgets.³⁷¹ Climate change adaptation, preparedness, and resilience accounted for 1% of fiscal year 2013's total budget and the majority of the funding was used for the DOI's climate change planning efforts.³⁷²

As a federal agency under the DOI, NPS took action to prepare their natural and cultural resources for the effects of climate change. In 2014, NPS director Jonathan Jarvis signed the Climate Change and Stewardship of Cultural Resources policy memorandum, outlining the NPS's response to climate change.³⁷³ The two main considerations for Cultural Resources and Climate Change are:

- Cultural Resources are primary sources of data regarding human interactions with environmental change
- Changing climates effect the preservation and maintenance of cultural resources³⁷⁴

As discussed in Chapter 3, climate change is a threat to historic resources, but cultural heritage can also provide information on how communities adapted to environmental change in the past.

³⁶⁹ Exec. Order. No. 13514, 80 Fed. Reg. 15869 (March 19, 2015), <https://www.federalregister.gov/documents/2015/03/25/2015-07016/planning-for-federal-sustainability-in-the-next-decade>.

³⁷⁰ "The President's Climate Change Action Plan," 12.

³⁷¹ Jane A. Leggett, Richard K. Lattanzio, and Emily Bruner, "Federal Climate Change Funding from FY2008 to FY2014" (Congressional Research Service, September 13, 2013), 1, <http://www.nationalaglawcenter.org/wp-content/uploads/assets/crs/R43227.pdf>.

³⁷² Leggett, Lattanzio, and Bruner, 11.

³⁷³ National Park Service, "Cultural Resources Climate Change Strategy," foreword.

³⁷⁴ National Park Service, 3.

This NPS memorandum also led to the passage of the NPS' CRCC in 2016 that provides guidance for NPS Managers to anticipate, prepare for, and respond to the potential effects of climate change on cultural resources. The CRCC emphasizes targeting the most vulnerable resources and documenting them before they are lost.³⁷⁵ The global western heritage framework will have to acknowledge that they cannot preserve all historic resources as the effects of climate change increase.

The Obama Administration released the President's Climate Change Action Plan in 2013. The plan outlined efforts to cut carbon pollution in the US, prepare the nation for the impacts of climate change, and how the United States would lead international efforts to address global climate change.³⁷⁶ Preparing the United States for climate change includes initiatives such as building stronger and safer communities and infrastructure, protecting the economy as well as natural and cultural resources, and using sound science to manage climate change impacts.³⁷⁷ Although we cannot estimate the full effects of climate change, preparing communities and resources based on current climate projections is a useful tool in protecting them. Much like disaster management, the best course of action involves planning before conditions get worse.

President Obama also signed Executive Order 13653 in 2013 to prepare the United States for Climate Change.³⁷⁸ This executive order created a State, Local, and Tribal Leaders Task Force on Climate Preparedness.³⁷⁹ Led by state and local officials from all over the United States, the Task Force encourages the federal government to help the local communities build their resiliency by reshaping programs, policies, and other forms of assistance for states,

³⁷⁵ National Park Service, foreword.

³⁷⁶ "The President's Climate Change Action Plan," 2–3.

³⁷⁷ "The President's Climate Change Action Plan," 12–16.

³⁷⁸ Exec. Order. No. 13653, 78 Fed. Reg. 66817 (November 1, 2013), <https://obamawhitehouse.archives.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change>.

³⁷⁹ Exec. Order. No. 13653, 78 Fed. Reg. 66817.

municipalities, tribal, and territorial jurisdictions to prepare for climate change.³⁸⁰ Mandating that the federal government share their financial and technical resources ensures that communities can better prepare for the effects of climate change in the future.

Unfortunately, with the exception of the NPS' CRCC, there is no legislation or federal agency plan that directly connects historic preservation to climate change planning. Obama's presidency had an uneven history with historic preservation that included making cuts to historic preservation programs. In his 2011 budget proposal, Obama eliminated the National Trust's Save America's Treasures (SAT) program and reduced funding for the Historic Preservation Fund by \$25 million.³⁸¹ Although the President and First Lady Michelle Obama initially supported SAT,³⁸² Obama cut the program as part of his "Tough Choices" budget stating that its benefits were unclear.³⁸³ In direct contrast, by the end of his two-term presidency, Obama designated the most National Monuments of any president (34), five of them within his last month in office.³⁸⁴ The Republican Party, and later the Trump Administration, criticized some of the designations, including Bears Ears and Katahdin Woods and Waters, for its loss of development and commercial interests.³⁸⁵ Although the Obama Administration was not always a full supporter of historic preservation, their Climate Change Action plan, Clean Power Plan, and executive orders

³⁸⁰ "President's State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience" (Council on Environmental Quality, November 2014), 2, https://obamawhitehouse.archives.gov/sites/default/files/docs/task_force_report_0.pdf.

³⁸¹ Janel Flechsig, "Obama's Proposed Budget to Slash Funding for Historic Preservation, National Park Service," accessed September 13, 2018, <https://www.wsws.org/en/articles/2011/02/hist-fl11.html>.

³⁸² "National Park Service Press Release (U.S. National Park Service)," February 1, 2011, <https://www.nps.gov/aboutus/news/release.htm>.

³⁸³ "Tough Choices," [whitehouse.gov](https://obamawhitehouse.archives.gov/blog/2010/01/30/tough-choices), January 30, 2010, <https://obamawhitehouse.archives.gov/blog/2010/01/30/tough-choices>.

³⁸⁴ "FACT SHEET: President Obama Designates National Monuments Honoring Civil Rights History," [whitehouse.gov](https://obamawhitehouse.archives.gov/the-press-office/2017/01/12/fact-sheet-president-obama-designates-national-monuments-honoring-civil), January 12, 2017, <https://obamawhitehouse.archives.gov/the-press-office/2017/01/12/fact-sheet-president-obama-designates-national-monuments-honoring-civil>.

³⁸⁵ "27 National Monuments Are Under Review. Here Are Five to Watch. - The New York Times," accessed September 12, 2018, <https://www.nytimes.com/interactive/2017/08/11/climate/doi-monument-review-five-to-watch.html>.

are critical to preparing historic resources for the effects of climate change. Unfortunately, the Trump Administration is taking these planning efforts in the wrong direction.

Climate Change Policies and Funding under Trump

Trump won the 2016 US Presidential election after a campaign that, among other issues, denounced the Obama Administration's climate policies and criticized their regulations, claiming they were unfair to private industries.³⁸⁶ The Trump Administration has taken several actions to pull away from Obama-era climate change policies, such as appointing climate change deniers (i.e., they are not scientists) to the head of scientific agencies, as well as reorienting research and funding away from climate science and environmental programs.

Trump began his presidency by signing a number of executive orders including those that reverse environmental policies enacted under the Obama Administration. Trump's Executive Order 13807 reverses President Obama's climate change planning initiatives and it revoked President Obama's Executive Order 13690, which required federally-funded projects to follow new flood risk management standards to reduce the future risk of flood damage.³⁸⁷ Specifically, 13690 mandated that floodplains are based on the "best available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science".³⁸⁸ Revoking this executive order increases the United States' risks of climate change and affects the Unified Federal Review process. Additionally, Executive Order 13690 mandated

³⁸⁶ Greshko et al., "A Running List of How Trump Is Changing the Environment."

³⁸⁷ Exec. Order. No. 13807, 82 Fed. Reg. 40463 (August 15, 2017), <https://www.whitehouse.gov/the-press-office/2017/08/15/presidential-executive-order-establishing-discipline-and-accountability>.

³⁸⁸ Greshko et al., "A Running List of How Trump Is Changing the Environment."

that FEMA update their floodplain requirements for Executive Order 11988 to include the risks of climate change; Trump's Executive Order removes this mandate.³⁸⁹

Executive Order 13771 is not directly related to climate change policy but does effect climate change planning for historic properties. Titled "Reducing Regulation and Controlling Regulatory Costs", Executive Order 13771 mandates that for every new regulation issued, the agency must eliminate two previous regulations.³⁹⁰ Unfortunately, this deregulation is taking the form of undoing climate actions in federal agencies to adhere to the administration's message. In June 2017, the NPS rescinded Director's Order 100, a policy that emphasized how park officials should take preventative measures to protect natural and historic resources by using climate science in park decision making.³⁹¹ The Obama Administration implemented the Climate Change Action plan to ensure that climate change planning was taking place at all levels of government, but 13771 could lead towards the deregulation of climate change planning at the federal level.

In addition to executive orders, the Trump Administration worked to dismantle environmental and climate change policies with funding changes to agencies and research efforts. As discussed in Chapter 1, Trump's 2018 budget proposal called for massive cuts to scientific research and environmental programs including a 31% cut to the EPA's overall budget. This cut included a 23% cut to the EPA's enforcement budget, illustrating the Trump Administration's goals to strip the agency of regulatory power.³⁹² In the administration's FY19 budget and

³⁸⁹ "Updates to Floodplain Management and Protection of Wetlands Regulations To Implement Executive Order 13690 and the Federal Flood Risk Management Standard," Federal Register, August 22, 2016, <https://www.federalregister.gov/documents/2016/08/22/2016-19810/updates-to-floodplain-management-and-protection-of-wetlands-regulations-to-implement-executive-order>.

³⁹⁰ Exec. Order. No. 13771, 82 Fed. Reg. 9339 (January 30, 2017), <https://www.whitehouse.gov/presidential-actions/presidential-executive-order-reducing-regulation-controlling-regulatory-costs/>.

³⁹¹ "Director's Order #100: Resource Stewardship for the 21st Century," accessed August 4, 2018, https://www.nps.gov/policy/DOrders/DO_100.htm.

³⁹² Greshko et al., "A Running List of How Trump Is Changing the Environment."

addendum, Trump proposed further rollbacks to US programs intended to study and mitigate the effects of climate change including FEMA, NPS, NOAA, and NASA.³⁹³

The Trump Administration cuts to NOAA's Research programs included reducing the National Weather Service's budget and eliminated the Climate Competitive Research program that provided extra-mural grants for climate research.³⁹⁴ In an effort to downsize NASA's climate science program, the Trump Administration ended NASA's Carbon Monitoring System in May 2018.³⁹⁵ These funding cuts can have detrimental effects on United States and global climate change planning efforts as these research programs contribute to the most up-to-date information on climate change projections.³⁹⁶ As nature is unpredictable, projections can shift quickly and drastically, leaving communities, states, and agencies unprepared.

Trump's FY19 Budget Proposal also contained funding cuts to cultural and historic initiatives, including a \$42 million appropriation for the closure of the National Endowment for the Humanities (NEH). The appropriation matches grant funds through October 1, 2018 and any costs relating to the orderly closure of the agency. The NEH provides grants that support artistic and cultural heritage initiatives including emergency grants, which help small cultural institutions such as museums, libraries, and archives recover from natural disasters. Museums and cultural institutions utilized NEH grants to recover after Hurricanes Harvey, Irma, and Maria in 2017.³⁹⁷ Cultural funding initiatives that support museums and libraries safeguard these cultural and

³⁹³ Greshko et al.

³⁹⁴ "FY19 Budget Request: 20% NOAA Cut Targets Research, Forecasters," February 21, 2018, <https://www.aip.org/fyi/2018/fy19-budget-request-20-noaa-cut-targets-research-forecasters>.

³⁹⁵ Greshko et al.

³⁹⁶ Greshko et al.

³⁹⁷ "NEH Statement on Proposed FY 2019 Budget," National Endowment for the Humanities, February 12, 2018, <https://www.neh.gov/news/press-release/2018-02-12-0>.

historic resources for future generations. Thankfully, Congressional Republicans supported the agency and funded it in their FY19 spending bill, preventing its closure.³⁹⁸

Trump's defunding climate research prevents organizations such as the NPS, FEMA, SHPOs, and THPOs from having the latest scientific projections necessary for planning purposes. Stripping cultural heritage organizations and programs of funding prevents them from protecting endangered resources or discovering undocumented archaeological sites. These changes not only endanger the ability to reduce the effects of climate change by cutting back on fossil fuel pollution, they also increase the United States' GHG emissions. In addition to these funding changes, the NPS relies on EPA policies like the Clean Air Act and the Clean Water Act to protect the parks' natural and cultural resources.³⁹⁹ While the Trump Administration is concerned with protecting the fossil fuel industry, historic and cultural resources are unprepared and unprotected from the impacts of climate change.

Trump and the National Monument Review

The Trump Administration's attitude towards climate change and its impacts on historic resources is echoed by the administration's attitude towards placing National Monuments and NPS parkland at risk. Trump has neglected and endangered historic properties, namely through changes he has made to the DOI, including the appointment of Secretary of the Interior Ryan Zinke. The DOI manages over 500 million acres of federal land and over 1.5 billion acres offshore. The department's mandate is to protect the nation's natural and historic resources and to

³⁹⁸ Sopan Deb, "Despite Trump Threat, N.E.A and N.E.H Are Spared in Spending Bill - The New York Times," March 23, 2018, <https://www.nytimes.com/2018/03/23/arts/nea-and-neh-spared-in-spending-bill.html>.

³⁹⁹ "Budget Proposal Threatens National Parks."

manage them for commercial use.⁴⁰⁰ The DOI's management of parkland and their resources is essential now because a study from the University of California at Berkeley and the University of Madison-Wisconsin found that the temperature in National Parks has increased at twice the rate as the rest of the United States over the last century. As the effects of climate change increase, the National Parks will provide the earliest indications for how climate change will impact the nation.⁴⁰¹ However, Zinke is working against the DOI's mandate, and the regulations he is supposed to implement,⁴⁰² by endangering historic sites and national monuments such as Bears Ears and Grand Staircase-Escalante.

In April 2017, Trump signed Executive Order 13792 directing the Secretary of the Interior to review up to 40 national monuments created under the AA since 1996.⁴⁰³ The executive order specifically targets monuments over 100,000 acres in size,⁴⁰⁴ including Bears Ears and Organ Mountains-Desert Peaks designated by the Obama Administration.⁴⁰⁵ There is no language in the 1906 AA that explicitly authorizes a President to abolish a national monument designated by a proceeding President and no President has done so yet. However, Congress does have the legal authority to modify and abolish monuments and they have exercised this ability by converting many National Monuments to National Parks.⁴⁰⁶ Regardless of this fact, Zinke opened up the review for the DOI's first-ever public comment period because he and Trump claimed

⁴⁰⁰ Elizabeth Kolbert, "The Damage Done by Trump's Department of the Interior," *The New Yorker*, January 14, 2018, <https://www.newyorker.com/magazine/2018/01/22/the-damage-done-by-trumps-department-of-the-interior>.

⁴⁰¹ Patrick Sisson, "Climate Change Will Strike U.S. National Parks Hardest and Fastest, Says Study," *Curbed*, September 24, 2018, <https://www.curbed.com/2018/9/24/17893160/national-parks-climate-change-glacier-national-park>.

⁴⁰² Kolbert, "The Damage Done by Trump's Department of the Interior."

⁴⁰³ Exec. Order. No. 13792, 82 Fed. Reg. 20429 (April 26, 2017), <https://www.whitehouse.gov/the-press-office/2017/04/26/presidential-executive-order-review-designations-under-antiquities-act>.

⁴⁰⁴ Exec. Order. No. 13792, 82 Fed. Reg. 20429.

⁴⁰⁵ "27 National Monuments Are Under Review. Here Are Five to Watch. - The New York Times."

⁴⁰⁶ "Establishment of National Monuments: Controversies Surrounding the Antiquities Act," *Congressional Digest* 96, no. 6 (June 2017): 6.

these monuments were designated “without adequate public outreach and coordination with relevant stakeholders”.⁴⁰⁷ Even though Obama-era Secretary of the Interior Sally Jewel and other Interior officials followed the Section 106 process by conducting nearly 1,000 public meetings with local citizens and interest groups to determine the designated area of Bears Ears.⁴⁰⁸

During the public comment period, Zinke received 2.8 million comments in support of the Monument designations.⁴⁰⁹ Supporters of National Monument designations assert that they preserve the nation’s most important and endangered places as public lands, utilizing them for recreation, scientific and historic research.⁴¹⁰ During his review, Zinke demonstrated that he was more concerned about the benefits for fossil fuel industries than the negative impact on natural and cultural resources by scheduling more meetings with oil companies than with Native American interest groups and other monument supporters.⁴¹¹

Zinke and Interior officials deliberately rejected material that would justify keeping the designations as is, instead seeking out evidence that would counter that argument. This included evidence of increased tourism revenue, studies that restrictions had not hurt commercial operations, and findings that designations resulted in fewer vandalism incidents at archaeological sites.⁴¹² Interior officials redacted information from a Bureau of Land Management (BLM) assessment that found “it is unlikely” that the Bears Ears designation impacted timber production

⁴⁰⁷ “Interior Department Releases List of Monuments Under Review, Announces First-Ever Formal Public Comment Period for Antiquities Act Monuments,” May 5, 2017, <https://www.doi.gov/pressreleases/interior-department-releases-list-monuments-under-review-announces-first-ever-formal>.

⁴⁰⁸ Wes Siler, “The Lies in the Secret National Monuments Memo,” Outside Online, September 19, 2017, <https://www.outsideonline.com/2242486/zinke-leaked-monuments-memo>.

⁴⁰⁹ September 18 and 2017 NRDC, “Leaked Zinke Memo Urges Trump to Shrink National Monuments,” NRDC, accessed September 23, 2017, <https://www.nrdc.org/experts/nrdc/leaked-zinke-memo-urges-trump-shrink-national-monuments>.

⁴¹⁰ Katy Steinmetz, “A Monumental Fight,” *Time* 190, no. 9 (September 4, 2017): 32.

⁴¹¹ Siler, “The Lies in the Secret National Monuments Memo.”

⁴¹² Juliet Eilperin, “Trump Administration Officials Dismissed Benefits of National Monuments,” accessed July 25, 2018, https://www.washingtonpost.com/national/health-science/trump-administration-officials-dismissed-benefits-of-national-monuments/2018/07/23/5b8b1666-8b9a-11e8-a345-a1bf7847b375_story.html?noredirect=on&utm_term=.396cefb5763e.

because these activities were allowed to continue. The BLM's assessment also noted that fewer archaeological and cultural heritage sites would have been identified at Grand Staircase-Escalante (a monument Zinke recommended to reduce) without the designation.⁴¹³ The large size of these monuments is justified by the undiscovered cultural sites present throughout the protected land. For example, the Obama Administration's DOI spent years documenting the nearly 100,000 cultural artifacts and sites believed to be located in Bears Ears to justify the 1.35-million-acre area of the Monument.⁴¹⁴ More funding is granted with monument designations, which in turn results in more archaeological, scientific, and cultural finds.⁴¹⁵ In addition, much like disaster management of historic properties has its economic benefits, protecting National Monument designations and National Parks is also good business. For example, one of the monuments under review, Cascade-Siskiyou, has added 1,044 jobs annually since President Clinton designated it in 2000⁴¹⁶ and the NPS generated \$35.8 billion nationwide in 2017.⁴¹⁷

Deliberately ignoring the evidence, Zinke recommended modifying ten national monuments and to reduce the boundaries of four. Also included in Zinke's final review was a proposal to open these public lands to commercial and recreational interests such as logging, commercial fishing, and drilling.⁴¹⁸ These commercial interests have already resulted in negative impacts. In March 2018, the US District Court of the District of New Mexico found that the BLM had violated the NHPA while selling land near Chaco Culture National Historic Park for hydraulic fracking and endangered historic sites and cultural resources present in the area

⁴¹³ Eilperin, "Trump Administration Officials Dismissed Benefits of National Monuments."

⁴¹⁴ Siler, "The Lies in the Secret National Monuments Memo."

⁴¹⁵ Eilperin, "Trump Administration Officials Dismissed Benefits of National Monuments."

⁴¹⁶ Siler, "The Lies in the Secret National Monuments Memo."

⁴¹⁷ Sisson, "Climate Change Will Strike U.S. National Parks Hardest and Fastest, Says Study."

⁴¹⁸ Eilperin, "Trump Administration Officials Dismissed Benefits of National Monuments."

surrounding the park.⁴¹⁹ However, if Section 106 review is conducted correctly, sub-surface activities on federal lands such as drilling should involve archaeological survey that could lead to the discovery of undocumented archaeological sites.

Because of Zinke's review, Trump announced he would downsize two monuments in December 2017. This proposed reduction included shrinking Bears Ears's Borders by 85% and cutting Grand Staircase Escalante nearly in half. Indian nations, conservation groups, paleontologists, environmental interest groups as well as outdoor recreation businesses opposed the reduction bringing attention to it online (Figure 4.1).⁴²⁰

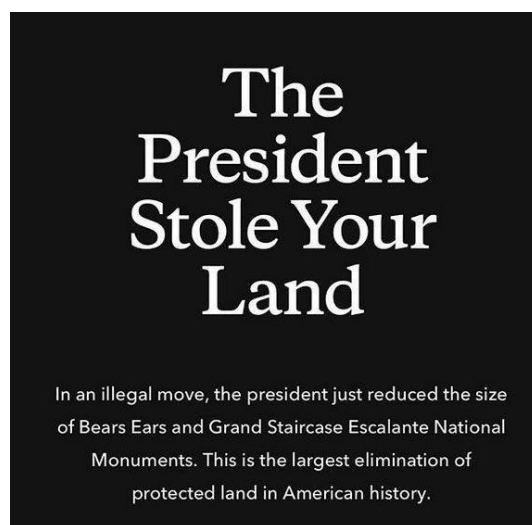


Figure 4.1: Patagonia, The President Stole Your Land, Protect Public Lands, <https://www.patagonia.com/protect-public-lands.html>, (accessed August 14, 2018).

The monument review and the sale of natural resources to commercial industries demonstrate that Zinke is working against his agency's mandate. His actions will not only result in a loss of climate data, but also cultural heritage. Public lands and the National Parks managed by the DOI represent remarkable and extreme environments such as Glacier National Park that

⁴¹⁹ Bonnie Povolny- April 15 and 2018, "BLM Failed to Comply with National Historic Preservation Act," accessed October 22, 2018, <https://culturalpropertynews.org/blm-failed-to-comply-with-national-historic-preservation-act/>.

⁴²⁰ Greshko et al., "A Running List of How Trump Is Changing the Environment."

are vulnerable to the effects of climate change.⁴²¹ Zinke's proposed commercial activities could put the already endangered areas at greater risk to climate change impacts. Areas that have now been cut out of these monuments will lose research funds, limiting future scientific and cultural discoveries as well as the loss of cultural heritage for future generations. In order to prepare these resources for the effects of climate change, preservationists, archaeologists, and native peoples need to record what resources are present in these public lands.

The Trump Administration Censors Science

In addition to changes made at environmental and cultural agencies, the Trump Administration is undermining climate research by requiring agency staffers to edit or delete information from federal project reports and webpages. Since the 2016 election and Trump's inauguration, the White House, the State Department and the Department of Energy websites have deleted or altered references to climate change.⁴²² The DOI removed mentions of climate change from their website⁴²³ as well as 92 documents describing the NPS's climate action plans.⁴²⁴ The loss of this information could be detrimental to local, national, and international climate change planning efforts.

In April 2017, the EPA also dismantled their climate change webpages and replaced them with a message that the site was being updated "to reflect EPA's priorities under the leadership of President Trump and Administrator Pruitt" (Figure 4.2). The EPA later relaunched their climate change page in October 2017 under the heading "Energy Resources for State, Local and Tribal

⁴²¹ Sisson, "Climate Change Will Strike U.S. National Parks Hardest and Fastest, Says Study."

⁴²² "Climate Change Information Removed from DOI Website," Columbia Law School Sabin Center for Climate Change Law, April 19, 2017, <http://columbiaclimatelaw.com/silencing-science-tracker/climate-change-information-removed-from-doi-website/>.

⁴²³ Greshko et al., "A Running List of How Trump Is Changing the Environment."

⁴²⁴ "Climate Change Documents Removed from NPS Website," Columbia Law School Sabin Center for Climate Change Law, December 20, 2017, <http://columbiaclimatelaw.com/silencing-science-tracker/climate-change-documents-removed-from-nps-website/>.

Governments”. This new page omitted links aimed at helping local officials plan for the effects of climate change including examples of statewide plans to adapt to climate change.⁴²⁵ These deletions could inhibit state and local climate change planning initiatives integral to the protection of historic sites. As another example of censored climate change science, the NPS’ Sea-Level Rise report illustrates how the censoring of information can effect climate change planning for historic resources.

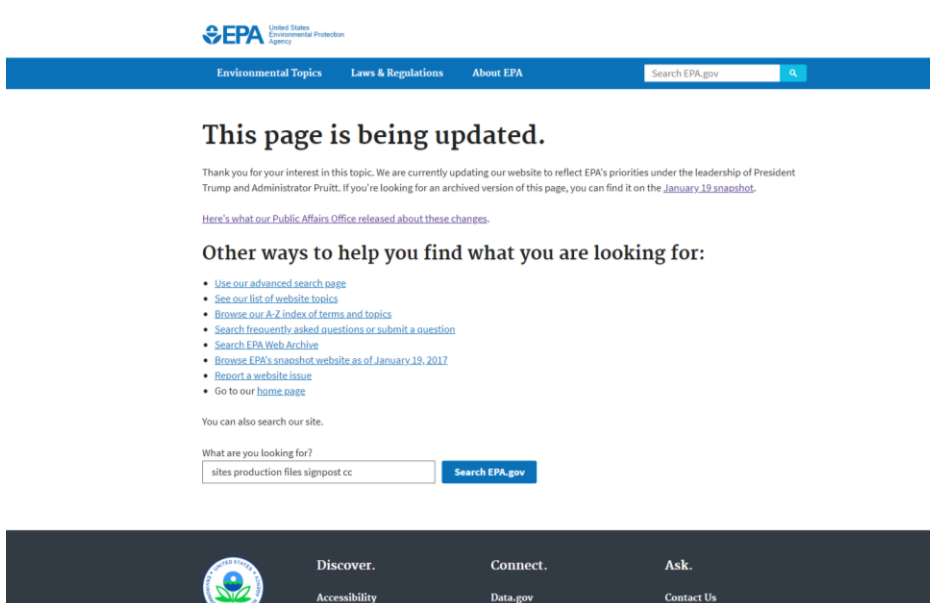


Figure 4.2: United States Environmental Protection Agency, Climate Change webpage, <https://www.epa.gov/sites/production/files/signpost/cc.html>, (accessed July 25, 2018)

In April 2018, after a 10-month delay, the NPS released a sea-level rise report that deleted any mention of human-induced climate change. The report investigated the risks of sea-level rise and storm surge at 118 coastal NPS historical and cultural sites including the National Mall in Washington DC, the original Jamestown settlement in Virginia, and the Wright Brothers National Memorial in North Carolina. The intention of the report was to inform park officials, policymakers, and the public about how to protect NPS resources from the effects of climate

⁴²⁵ “EPA Website Relaunched Without Climate Change Materials - Sabin Center for Climate Change Law,” accessed August 4, 2018, <http://columbiaclimatelaw.com/silencing-science-tracker/epa-removed-links-to-climate-change-resources-for-local-governments-from-website/>.

change. However, the 10-month delay in its release prevented park managers and the public from having access to the latest climate data to help them prepare for hurricane forecasts and safeguard collections from floodwaters. If the NPS released the report on time, park managers could have utilized the storm surge maps for the US Virgin Islands' National Park to prepare their natural and historic resources for inundation from Hurricanes Irma and Maria in 2017.⁴²⁶ In addition, NPS made significant deletions and edits regarding the human-induced effects of climate change across 18 drafts of the report.⁴²⁷ In May 2018, NPS officials agreed to restore the original text in response to a Senate Committee Hearing.⁴²⁸

The NPS deletions and edits included removing words like “anthropogenic” and “human activities” in reference to the causes of climate change in multiple locations. Other specific deletions and edits included the following:

- Original sentence: “Changing relative sea levels and the potential for increasing storm surges due to anthropogenic climate change present challenges to national park managers”
- Edited sentence: “Ongoing changes in relative sea levels and the potential for increasing storm surges present challenges to national park managers.”⁴²⁹
- Deleted sentence about Hurricane Sandy: “This single storm cannot be attributed to anthropogenic climate change, but the storm surge occurred over a sea whose level had risen due to climate change.”⁴³⁰
- Deleted sentences about sea level rise and global warming: “While sea levels have been gradually rising since the last glacial maximum approximately 21,000 years ago, anthropogenic climate change has significantly increased the rate of global sea level rise. Human activities continue to release carbon dioxide (CO₂) in the atmosphere, causing the Earth’s atmosphere to warm.”⁴³¹

⁴²⁶ Elizabeth Shogren, “Park Service Report Nixes Humans’ Role in Climate Change,” April 2, 2018, <https://www.hcn.org/articles/corruption-human-role-in-climate-change-removed-from-science-report>.

⁴²⁷ Shogren.

⁴²⁸ Elizabeth Shogren, “National Parks Report on Climate Change Finally Released, Uncensored,” accessed August 4, 2018, <https://www.revealnews.org/blog/national-parks-report-finally-released-uncensored/>.

⁴²⁹ Maria Caffrey, Rebecca L. Beavers, and Cat Hawkins Hoffman, “Sea Level Rise and Storm Surge Projections for the National Park Service,” NPS/NRSS/NRR (National Park Service, May 2018), viii, <https://www.nps.gov/subjects/climatechange/upload/2018-NPS-Sea-Level-Change-Storm-Surge-Report-508Compliant.pdf>.

⁴³⁰ Caffrey, Beavers, and Hoffman, 2.

⁴³¹ Shogren, “Park Service Report Nixes Humans’ Role in Climate Change.”

The role humans play in global climate change is crucial to decisions about reducing GHG that will increase sea level rise and storm surge at coastal national parks. For example, the report calculates sea level rise in the years 2030, 2050, and 2100 based on four global emission scenarios. Depending on the scenario, the National Mall's sea level projections in 2100 range from 1.74 feet to 2.62 feet. This scenario planning is essential to disaster planning for historic resources in the coastal parks such as the Everglades in Florida, the Statue of Liberty and Ellis Island in New York, Glacier National Park in Montana,⁴³² as well as historic and archaeological sites in Hawaii.⁴³³ Although some of the original government webpages are still accessible through the Wayback machine that archives government webpages,⁴³⁴ the censoring of the NPS' sea level rise report had real-world consequences as the 2017 hurricane season caused millions of dollars in damage to historic sites and properties in Texas, Puerto Rico, and the US Virgin Islands.⁴³⁵

The Trump Administration, FEMA, and the 2017 Hurricane Season

The majority of this chapter has focused on policy and funding changes made by the Trump Administration. With the exception of the monument review and reduction, the full impact of many of these changes on historic properties and heritage sites remains to be seen. However, this was not the case with the Trump Administration's response to the 2017 hurricane season. The extremely active season resulted in 17 named storms, including 10 hurricanes, and 6 major

⁴³² Sisson, "Climate Change Will Strike U.S. National Parks Hardest and Fastest, Says Study."

⁴³³ "Maui Now: Tackling Climate Change Impacts on Cultural Heritage," Maui Now | Tackling Climate Change Impacts on Cultural Heritage, accessed October 17, 2018, <https://mauinow.com/2018/09/11/tackling-climate-change-impacts-on-cultural-heritage/>.

⁴³⁴ "Blackout Government Websites Available Through Wayback Machine | Internet Archive Blogs," accessed September 12, 2018, <https://blog.archive.org/2013/10/02/governmentblackout/>.

⁴³⁵ National Trust for Historic Preservation et al., "Historic Preservation Disaster Assistance Package for Hurricanes Harvey, Irma, and Maria," November 27, 2017, <https://forum.savingplaces.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=9302f939-13ca-94e9-33fa-0ef10a268ec8>.

hurricanes.⁴³⁶ Instead of acknowledging that the active season was partially attributed to climate change, Trump insisted that “we’ve had bigger storms”.⁴³⁷ This dismissal had very real consequences in the recovery and response to these storms, namely in Puerto Rico.

Although the damage from Hurricane Maria in Puerto Rico far exceeded the damage from Harvey in Texas or Irma in Florida, FEMA and the Trump Administration’s response to Maria was initially slower and less attentive than to Harvey or Irma.⁴³⁸ FEMA eventually deployed more resources and personnel to Puerto Rico, but the increase took more than three weeks.⁴³⁹ Former FEMA officials and disaster response experts said the slow response to Puerto Rico and the US Virgin Islands is evidence that FEMA and the Trump Administration underestimated the intensity of the storm and neglected to pre-position valuable assets and resources.⁴⁴⁰ The Administration’s blatant denial of the existence of climate change had direct impacts on their recovery operations for communities and their historic resources in Puerto Rico and the US Virgin Islands.

The territories and states impacted by the 2017 hurricane season contain more than 150,000 NRHP-listed or eligible sites which need to undergo the Unified Federal Review Process before repairs can take place.⁴⁴¹ In response to the season’s unprecedented destruction, Congress only granted \$17.5 million from the Historic Preservation Fund for the repair of historic properties damaged by Harvey, Irma, and Maria. Hurricanes Katrina and Sandy each received \$50 million for the repair and restoration of historic structures, \$17.5 million is not sufficient for

⁴³⁶ “Extremely Active 2017 Atlantic Hurricane Season Finally Ends.”

⁴³⁷ “Obama’s FEMA Chief.”

⁴³⁸ “A Land They No Longer Recognize,” *TIME.Com* (blog), 34, accessed August 11, 2018, <http://time.com/a-land-they-no-longer-recognize/>.

⁴³⁹ Danny Vinik, “How Trump Favored Texas over Puerto Rico,” *POLITICO*, accessed August 11, 2018, <https://politi.co/2unqfsD>.

⁴⁴⁰ Vinik, “How Trump Favored Texas over Puerto Rico.”

⁴⁴¹ Kurt Repanshek, “How Much Hurricane Relief Will Congress Provide The National Park Service?,” *National Parks Traveler*, February 8, 2018, <https://www.nationalparkstraveler.org/2018/02/updated-how-much-hurricane-relief-will-congress-provide-national-park-service>.

the repairs that need to take place after this historic season. In response, the NTHP, the National Conference of State Historic Preservations Officers, the National Association of Tribal Historic Preservation Officers, the AIA, and the Coalition for American Heritage appealed to congress for a Disaster Assistance package that included a two-year, \$120 million-dollar grant program through the Historic Preservation Fund.⁴⁴² In February 2018, Senate enacted the final funding appropriations, allocating \$50 million for the Historic Preservation Fund.⁴⁴³ Although not as comprehensive as the proposed Disaster Assistance Package, these recovery funds are crucial to long-term rebuilding efforts for affected communities. They help create jobs, catalyze economic redevelopment, rehabilitate historic buildings and preserve historic sites and cultural heritage.⁴⁴⁴

FEMA also reevaluated the recovery and response efforts in their After Action Report for the 2017 Hurricane Season.⁴⁴⁵ FEMA acknowledged that they could have better utilized open-source and preparedness data in their response to Puerto Rico and the US Virgin Islands and their new Strategic Plan aims to improve disaster preparedness over the next five years. Building on the previous two strategic plans, the new plan aims to build a culture of preparedness, prepare the US for catastrophic disasters and reduce the complexity of FEMA.⁴⁴⁶

The Strategic Plan acknowledges that costs of disasters will continue to increase with rising natural hazard risks⁴⁴⁷ but does not discuss how climate change is increasing those risks. In fact, it does not mention climate change at all. Instead, the plan focuses on the increased

⁴⁴² National Trust for Historic Preservation et al., “Historic Preservation Disaster Assistance Package for Hurricanes Harvey, Irma, and Maria.”

⁴⁴³ Repanshek, “How Much Hurricane Relief Will Congress Provide The National Park Service?”

⁴⁴⁴ National Trust for Historic Preservation et al., “Historic Preservation Disaster Assistance Package for Hurricanes Harvey, Irma, and Maria.”

⁴⁴⁵ United States. Department of the Homeland Security. Federal Emergency Management Agency, “2017 Hurricane Season FEMA After-Action Report” (FEMA, July 12, 2018), vi, <https://www.fema.gov/media-library-data/1531743865541-d16794d43d3082544435e1471da07880/2017FEMAHurricaneAAR.pdf>.

⁴⁴⁶ United States. Department of the Homeland Security. Federal Emergency Management Agency, “2018-2022 Strategic Plan” (FEMA, March 15, 2018), 7, https://www.fema.gov/media-library-data/1533052524696-b5137201a4614ade5e0129ef01cbf661/strat_plan.pdf.

⁴⁴⁷ United States, “2018-2022 Strategic Plan”, 10.

populations on coastlines and efforts for pre-mitigation. To accomplish pre-mitigation strategies, FEMA emphasizes having access to current and accurate risk information, in order to assess and quantify risk.⁴⁴⁸ However, communities and individuals cannot fully anticipate or assess risk without estimating how future natural hazards will be affected by climate change. As discussed in Chapter 2, Hurricane Katrina led to policy actions such as the NDRF that improved disaster planning and mitigation in the United States. FEMA's current Strategic Plan aims to continue this effort, but this objective is impossible without estimating the future impacts of climate change.

The 2017 hurricane season was clear evidence that climate change is increasing the frequency and intensity of natural hazards. Two recent studies by National Geographic found that climate change tripled the odds of a Harvey-level intense cyclonic storm and increased Harvey's record rainfall by 15%.⁴⁴⁹ Despite this growing threat, FEMA has removed all mentions of climate change from its Strategic Plan and Trump has removed climate change as a threat to National Security.⁴⁵⁰ At the time of writing, the 2018 hurricane season is still underway. Hurricane Lane dropped record rainfall on Hawaii while the state also dealt with Mount Kilauea, a volcano that erupted for months.⁴⁵¹ Hurricane Florence caused major damage throughout North and South Carolina and was quickly followed by Hurricane Michael in Florida, Georgia, and the Carolinas again.⁴⁵² Final damage assessments are not yet available for the 2018 Hurricane Season, but storms such as Hurricane Michael (October 2018) emphasize how climate change is impacting areas previously untouched by severe storms, such as the Florida Panhandle.⁴⁵³

⁴⁴⁸ United States, "2018-2022 Strategic Plan", 13–14.

⁴⁴⁹ "Climate Change Likely Supercharged Hurricane Harvey," accessed September 3, 2018, <https://news.nationalgeographic.com/2017/12/climate-change-study-hurricane-harvey-flood/>.

⁴⁵⁰ Greshko et al., "A Running List of How Trump Is Changing the Environment."

⁴⁵¹ "Hawaii Battens the Hatches for Hurricane Lane," Environment, August 22, 2018, <https://www.nationalgeographic.com/environment/2018/08/hawaii-hurricane-lane-volcano-news/>.

⁴⁵² Chris Dixon and Campbell Robertson, "They Were Still Recovering from Hurricane Florence. Then Michael Came.," *The New York Times*, October 12, 2018, sec. U.S., <https://www.nytimes.com/2018/10/11/us/carolinas-hurricane-florence-michael.html>.

⁴⁵³ Mazzei, "Among the Ruins of Mexico Beach Stands One House, Built 'for the Big One.'"

Many of the states affected in the 2017 and 2018 Hurricane seasons are traditionally Republican “red” states. Republican lawmakers tend to advocate for federal recovery funds in their state, but vote against recovery funding for traditionally Democratic “blue” states such as New Jersey and New York after Hurricane Sandy.⁴⁵⁴ Additionally, a study from the American Meteorological Society in 2013 found that states that received the most federal recovery-aid for climate change-linked extreme weather events elected climate-science deniers to the Senate and the House.⁴⁵⁵ States, cities, and municipalities now must create long-term planning initiatives to prepare their historic resources for natural hazards because the federal government may provide little to no financial and technical support in future climate change-linked disaster events.

Federal Agency Rogue Twitter Accounts and the Paris Agreement

Upon his election, Trump became the only current head of state in the world to deny mainstream climate science.⁴⁵⁶ As Trump’s funding and policy changes began, scientists grew concerned about the ease by which Trump’s policies could diminish the public access to climate change data and collaboration⁴⁵⁷ and changes made to government websites turned some of these fears into reality. While the federal government continues to ignore the threat of climate change, government employees as well as local and state governments have taken matters into their own hands.

⁴⁵⁴ Daniel J. Weiss, Jackie Weidman, and Stephanie Pinkalla, “States of Denial: States with the Most Federal Disaster Aid Sent Climate-Science Deniers to Congress,” Center for American Progress, accessed October 22, 2018, <https://www.americanprogress.org/issues/green/reports/2013/09/12/73895/states-of-denial-states-with-the-most-federal-disaster-aid-sent-climate-science-deniers-to-congress-2/>.

⁴⁵⁵ Jamelle Bouie, “Help to Those Who Help Themselves,” *Slate*, August 30, 2017, http://www.slate.com/articles/news_and_politics/politics/2017/08/why_the_gop_flip_flops_on_federal_disaster_relief.html.

⁴⁵⁶ Eric Holthaus, “Why I’m Trying to Preserve Federal Climate Data before Trump Takes Office,” *Washington Post*, accessed July 26, 2018, <https://www.washingtonpost.com/posteverything/wp/2016/12/13/why-im-trying-to-preserve-federal-climate-data-before-trump-takes-office/>.

⁴⁵⁷ Hamblin, “Access Denied,” 165–66.

As climate change language, data, and entire webpages were disappearing from federal agency websites, other agencies were replacing the website language with words like “resiliency” and “sustainability”. For example, agencies such as the EPA changed program names from “Climate Ready Water Utilities” to “Creating Resilient Water Utilities”. Many of these changes occurred prior to the inauguration, leading some to believe agency staffers changed the language to protect the data from the incoming administration.⁴⁵⁸ In my own experience at an internship with FEMA’s EHP, similar language was used in ongoing Hurricane Sandy-related recovery projects. When discussing efforts to prepare historic structures for the effects of climate change, FEMA staff referred me to “resiliency” examples made after Hurricane Sandy.

Federal agency staffers also formed rogue twitter accounts in response to climate change alterations on government websites. First was the AltUSNatParkService (Figure 4.3) which branded itself as the “Unofficial #Resistance team of US National Park Service”. There are now more than a dozen alt-agency twitter accounts posting climate science facts regarding their agencies.⁴⁵⁹ Alt-EPA, AltNPS, and RogueNASA, claim to represent the concerned scientists working within these agencies who fear the loss of climate change data under the Trump Administration. Rogue accounts representing individual national parks such as AtlYellowstoneNatPark and AltRockyNPS bring attention to historic preservation issues, calling out the national monument review’s threat to historic preservation and efforts to dismantle the AA.⁴⁶⁰

⁴⁵⁸ “Word ‘Climate’ Removed from EPA Program Name and Website - Sabin Center for Climate Change Law,” accessed August 12, 2018, <http://columbiaclimatelaw.com/silencing-science-tracker/climate-removed-from-epa-water-program-name-and-website/>.

⁴⁵⁹ “3 Things You Need to Know About the Science Rebellion Against Trump,” National Geographic News, January 27, 2017, <https://news.nationalgeographic.com/2017/01/scientists-march-on-washington-national-parks-twitter-war-climate-science-donald-trump/>.

⁴⁶⁰ Kurt Repanshek, “What To Make Of The Alt Movement Today?,” National Parks Traveler, November 19, 2017, <https://www.nationalparkstraveler.org/2017/11/what-make-alt-movement-today>.

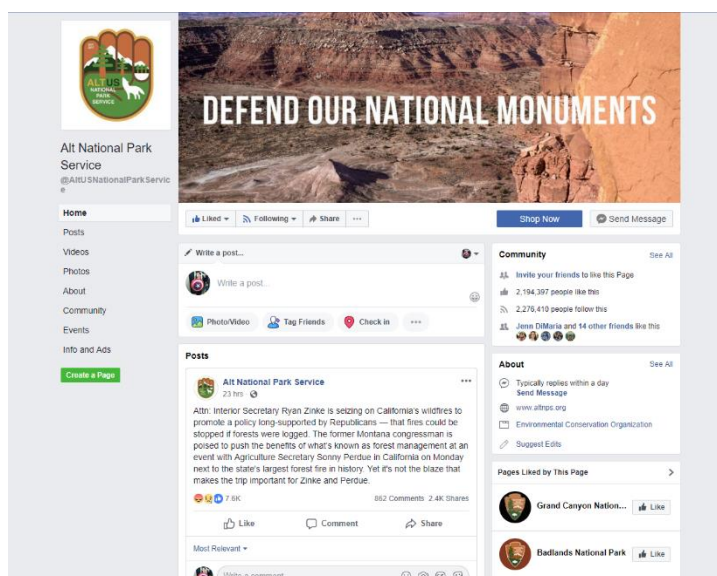


Figure 4.3: Alt National Park Service, AltNPS Facebook page as of August 2018, Facebook, https://www.facebook.com/AltUSNationalParkService/?hc_ref=ARTpF7884ok_dFhwX6WGmGjukcNwe-XLCbQN8SbgYa8muXLsJXYGd0JxvXq-nfKrkc0&fref=nf, (accessed August 14, 2018).

Individual states and cities are also taking action to fight Trump’s climate change denial. As a result of Trump’s announcement to leave the Paris Agreement, New York, California, and Washington announced the formation of the United States Climate Alliance with the promise to fulfill the GHG emission reductions outlined by the agreement.⁴⁶¹ Today, the Alliance has gained the membership of 16 states as well as Puerto Rico.⁴⁶² US states, cities, state attorney generals, businesses, and universities have also banded together to create “We Are Still In”. Signatories from 276 cities and counties, 10 states, 345 colleges and universities, and 1,914 businesses and investors have agreed to uphold the Paris Agreement.⁴⁶³ The Mayors National Climate Action Agenda network also released a statement signed by 407 mayors to uphold the Paris Agreement.⁴⁶⁴ Despite this show of support throughout the country for the Paris Agreement, Trump has not announced his intention to stay. If Trump does eventually follow through in

⁴⁶¹ “Map Shows Growing U.S. ‘Climate Rebellion’ Against Trump,” National Geographic News, June 8, 2017, <https://news.nationalgeographic.com/2017/06/states-cities-usa-climate-policy-environment/>.

⁴⁶² “GOVERNORS,” U.S. Climate Alliance, accessed August 12, 2018, <https://www.usclimatealliance.org/governors-1/>.

⁴⁶³ “Who’s In,” We Are Still In, accessed August 11, 2018, <https://www.wearestillin.com/signatories>.

⁴⁶⁴ “Climate Mayors,” accessed August 11, 2018, <http://climatemayors.org/>.

withdrawing, the United States will become the only nation to leave the global response to climate change.⁴⁶⁵

In reaction to Trump's policy and funding changes as well as his overall denial of climate change, private citizens, government employees, and local and state governments have taken matters into their own hands. Rogue twitter accounts continue to disseminate climate change research as well as natural and historic preservation concerns to the public. Even if Trump has ceded the United States' leadership in the global climate change arena, states, cities, and universities are still involved in the Paris Agreement's effort. Without federal leadership to prepare historic resources for climate change, states, counties, and cities have the responsibility to integrate historic resource climate change planning into disaster management.

Conclusion

President Trump's changes to policies, executive orders, climate science research, as well as agency appointments can have far-reaching consequences for disaster management of historic resources. The fact that FEMA no longer includes climate change in its Strategic Plan and that Trump has removed climate change from his list of National Security threats, illustrates how the Trump Administration is deliberately not planning for the effects of climate change. The DOI National Monument review and reduction could lead to the loss of cultural heritage sites. The Trump Administration's defunding of federal arts and humanities programs could lead to the loss of endangered cultural sites as well as vulnerable cultural institutions. States, cities, and local municipalities must prepare for the impacts of future natural hazards as well as climate change effects to protect communities and their beloved cultural and historic resources. Public and private citizens are already promising to fight the changes made by the Trump Administration and

⁴⁶⁵ "Map Shows Growing U.S. 'Climate Rebellion' Against Trump."

to uphold the Paris Agreement at the state and local level. In the next chapter, I will discuss how some states and cities are also preparing historic resources specifically for disaster events.

Chapter 5: State and Local Plan Case Studies

Chapter 4 demonstrated how climate change planning for cultural resources is changing in the United States under the Trump Administration. The current federal administration is inhibiting climate change planning for historic resources by defunding or blocking scientific research and endangering historic sites on public lands. While the far-reaching consequences of Trump's current science and environmental policies are beyond the scope of this thesis, I aim to present best practices for climate change-driven disaster management planning for historic properties at the state and local level.

The following chapter will review a content analysis of disaster management plans or planning processes at the county, state, and local level in Pennsylvania, Florida, and Maryland. Using the Historic Resource Disaster Plan Checklist (Appendix B) discussed in the methodology, I will review the results of my analysis as well as discuss what aspects of disaster management and climate change planning are included in these plans and the areas where they lack information. Finally, I will recommend how to fill these planning gaps based on information from FEMA's Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning Guide and the NPS' CRCC used to create the assessment checklist.

Pennsylvania's Historic Preservation Element of Hazard Mitigation

The NPS awarded \$1.5 million to Pennsylvania for the recovery and repair of historic properties and sites damaged by Hurricane Sandy as well as the creation of a disaster planning initiative for historic resources,⁴⁶⁶ which will develop best practices for addressing future disaster

⁴⁶⁶ "Project Overview," Disaster Planning, accessed August 29, 2018, <https://www.phmc.pa.gov:443/Preservation/Disaster-Planning/Pages/Project-Overview.aspx>.

events.⁴⁶⁷ Four of the eighteen Pennsylvania counties that received federal disaster declarations for Hurricane Sandy are piloting the program: Bedford, Cameron, Monroe, and the city of Philadelphia. PA SHPO also selected these three counties and one city because their hazard mitigation plans are close to, or have passed, their 5-year renewal dates. Once each pilot county completes their disaster planning initiative in 2020, they will integrate the results as a historic preservation element of their individual county hazard mitigation plans.⁴⁶⁸ Because this is still an ongoing planning process, my content analysis for Pennsylvania included a review of the Pennsylvania's SHPO's blog posts detailing this planning process and the Phase I⁴⁶⁹ survey reports from the four piloted areas.

The PA SHPO's blog posts and the county Phase I reports outlined the planning process for the historic disaster planning initiative, dividing the survey of vulnerable historic properties into two phases. Phase I focused on identifying and surveying vulnerable historic properties in the four pilot areas as well as recording their character defining and historic features. Phase II included the risk assessment of historic properties, hazard mitigation action development, and identifying gaps in existing plans and ordinances regarding historic preservation considerations.⁴⁷⁰ Pennsylvania's previously established programmatic agreements⁴⁷¹ as well as FEMA's Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning Guide formed the basis of these survey stages,⁴⁷² ensuring that they adhered to best practices established at the state and federal level.

Even though the historic preservation element will not be complete until 2020, the disaster planning initiative's surveys demonstrated an extensive knowledge of best practices for

⁴⁶⁷ "Mitigation Projects," Disaster Planning, accessed August 29, 2018, <https://www.phmc.pa.gov:443/Preservation/Disaster-Planning/Pages/Mitigation-Projects.aspx>.

⁴⁶⁸ "Before the (Next) Storm."

⁴⁶⁹ At the time of writing, Phase II of the survey was completed but the reports were not finalized.

⁴⁷⁰ "Before the (Next) Storm."

⁴⁷¹ "Project Overview."

⁴⁷² "Before the (Next) Storm."

disaster planning for historic properties recommended by FEMA. County officials coordinated with other stakeholders and agencies to complete the historic resources survey in all four areas. All four pilot counties included public outreach in their planning process and in Philadelphia, the city's Office of Emergency Management worked with the USACE to complete their survey.⁴⁷³ The planning process also demonstrated the importance of a historic resource inventory in Phase I: recording the condition, significance, and historic features of vulnerable historic resources on historic property sheets.⁴⁷⁴ Bedford County and Philadelphia went one-step further in this survey process, rating the historic property's physical condition as Excellent, Good, Fair, or Poor and their ability to retain their historic character defining features as High, Moderate, or Low.⁴⁷⁵ The historic property sheets establish a baseline for surveyed properties; disaster managers and preservationists can use them to monitor the properties' vital signs and for Section 106 regulatory review.⁴⁷⁶ Pennsylvania's Phase I survey demonstrated that they are preparing their historic resources with the Unified Federal Review process in mind.

The Phase I survey also used the appropriate tools to identify which resources in the pilot counties were vulnerable to their identified hazards. Connecting CRGIS databases such as the Pennsylvania Register of Historic Places with flood inundation GIS mapping programs, the

⁴⁷³ "Preservation Partnerships: Working Together To Save Historic Resources From Natural Disasters," Pennsylvania Historic Preservation, September 9, 2015, <https://pahistoricpreservation.com/preservation-partnerships-working-together-save-historic-resources-from-natural-disasters/>.

⁴⁷⁴ "Hazard Planning in a Historic Context: Part 2 - Taking Action," Pennsylvania Historic Preservation, June 13, 2018, <https://pahistoricpreservation.com/hazard-planning-part-2/>.

⁴⁷⁵ AECOM, "Phase 1: Historic Building Flood Vulnerability Assessment Data Recordation City of Philadelphia, Pennsylvania," Disaster Planning for Historic Properties Initiative (Pennsylvania Historical and Museum Commission, June 2016), 10–13, https://www.dot7.state.pa.us/CRGIS_Attachments/Survey/PHMC_DP_PHL_FINAL_REPORT.pdf; Jennifer Robinson et al., "Phase 1: Historic Resource Survey Bedford County, Pennsylvania," Disaster Planning for Historic Properties Initiative (Pennsylvania Historical and Museum Commission, April 2017), 14–16, https://www.dot7.state.pa.us/CRGIS_Attachments/Survey/2017H002009A.pdf.

⁴⁷⁶ "Following in Sandy's Path."

planning team identified large concentrations of historic properties in floodplains.⁴⁷⁷ The Disaster Planning Initiative also created a Historic Resource Vulnerability Survey Form for each property during Phase I. The form includes the property's character defining features as well as its flood vulnerability to storm surge and sea level rise.⁴⁷⁸ Historic property forms are available to the public through PA's CRGIS system, assisting private property owners in flood mitigation for these properties. CRGIS's information on archaeological sites is restricted to professionals to ensure their protection.

Where the Phase I survey was lacking however, was the discussion of other hazards and risks to historic resources within these four pilot counties. Pennsylvania experiences flood hazards and Philadelphia is in danger of sea-level rise and storm surge during high tide and tropical storms.⁴⁷⁹ Flooding is the most common hazard in the state, but it is not the only one, as identified and discussed by each county's Hazard Mitigation Plan (HMP). Extreme heat, cold, and severe winter storms⁴⁸⁰ can endanger historic resources by causing power outages, fires, and possible damage from ice and snow on character defining historic features. The cultural resources identified using GIS were the most vulnerable to flood inundation and were prioritized for survey.

⁴⁷⁷ "Preservation Partnerships"; "Disaster Planning for Historic Properties in a World Heritage City - Pennsylvania Historic Preservation," accessed August 29, 2018, <https://pahistoricpreservation.com/disaster-planning-historic-properties-world-heritage-city/>; "Getting High-Tech to Identify Monroe County's Flood-Prone Historic Places - Pennsylvania Historic Preservation," accessed August 29, 2018, <https://pahistoricpreservation.com/getting-high-tech-to-identify-monroe-countys-flood-prone-historic-places/>.

⁴⁷⁸ Pennsylvania State Historic Preservation Office and Pennsylvania Historical and Museum Commission, "Historic Resource Flood Hazard Vulnerability Survey Form: Fort Mifflin," June 2016, https://www.dot7.state.pa.us/CRGIS_Attachments/SiteResource/H001371_001352_01D.pdf.

⁴⁷⁹ "Preservation Partnerships."

⁴⁸⁰ Tetra Tech, Inc., "Bedford County Hazard Mitigation Plan 2017 Update" (Bedford County Department of Emergency Services, October 2017), 4.24-4.4-1; MCM Consulting Group, Inc., "Cameron County 2017 Hazard Mitigation Plan" (Cameron County Office of Emergency Services, 2017), 32-134; "City of Philadelphia All Hazard Mitigation Plan" (Office of Emergency Management City of Philadelphia), 80-86 & 90-250, accessed August 20, 2018, https://www.phila.gov/media/20161107113053/DRAFT-2017-Hazard-Mitigation-Plan_NON-FOUO.pdf; MCM Consulting Group, Inc., "Monroe County 2016 Hazard Mitigation Plan" (Monroe County Office of Emergency Management, 2016), 36-154, <http://www.monroecountypa.gov/Dept/EMA/Documents/2016MonroeCountyHMPDraftV5%2003-08-2016.pdf>.

However, historic properties and structures (i.e. bridges) were the only historic and cultural resources considered in the Phase I survey. The newly updated Pennsylvania SHPP includes archaeological sites, landscapes, and cemeteries as well as other historic resources present throughout the state.⁴⁸¹

Phase II of the planning initiative focused on the development of mitigation actions. The final Phase II reports for the four counties were not available at the time of writing, but SHPO's blog provided a brief overview of what these mitigation actions involve. In Philadelphia, the goal is to develop "non-structural" flood proofing methods for up to 25 types of structures, including the ubiquitous brick row house.⁴⁸² In all four counties, structural flood proofing methods will include the development of location specific and structure specific mitigation actions that are sensitive to the structure's integrity and the Secretary of the Interior's Standards for the Treatment of Historic Properties. These include sensitive elevations of historic structures, elevation of their utilities, and temporary actions such as sandbagging and temporary floodwalls. Historic preservation professionals and private property owners can then apply the mitigation actions developed in these four counties to other properties and environments throughout the state.

The initiative is also developing a flood depth visualization program for property owners to illustrate where water would enter a building during a 100-year flood event (Figure 5.1);⁴⁸³ this program will assist private property owners in prioritizing their flood proofing methods. While this assessment of disaster planning initiative's mitigation actions is not fully comprehensive without the Phase II reports, Phase I demonstrated a good working knowledge of best practice mitigation actions for historic properties. As long as historic preservation professionals provide

⁴⁸¹ "Pennsylvania's Statewide Historic Preservation Plan" (Pennsylvania Historical and Museum Commission, 2023 2018), 25–32, 49, 54, <https://www.phmc.pa.gov/Preservation/Preservation-Plan/Documents/2018-Final-Statewide-Plan-Web.pdf>.

⁴⁸² "Preservation Partnerships."

⁴⁸³ "Hazard Mitigation in a Historic Context: Update on Historic At-Risk Properties Initiative," Pennsylvania Historic Preservation, November 15, 2017, <https://pahistoricpreservation.com/hazard-mitigation-historic-context-update-historic-risk-properties-initiative/>.

education and technical training for private property owners completing the mitigation actions, the initiative's mitigation actions and priorities adhere to the guidelines outlined by disaster management and cultural resource professionals.



Figure 5.1: Flood-depth visualizations, Pennsylvania Historic Preservation website, <https://pahistoricpreservation.com/hazard-mitigation-historic-context-update-historic-risk-properties-initiative/>, (accessed August 15, 2018).

Phase II of the initiative also identified existing gaps in plans and local ordinances to incorporate historic preservation concerns into disaster management planning.⁴⁸⁴ While the results of Phase II of the initiative are not currently available, the ultimate goal is to incorporate a historic preservation element into Pennsylvania's county-level hazard mitigation plans. This will make them eligible for funds from FEMA grant programs such as the Hazard Mitigation Grant Program in future disaster events. Other Pennsylvania counties will then duplicate the disaster planning initiative and the pilot counties will become the first counties in the United States to incorporate historic preservation elements into their hazard mitigation plans.⁴⁸⁵

The Pennsylvania Disaster Planning Initiative stresses planning, hazard identification and risk assessment, as well as mitigation actions and priorities. Despite its strengths, Phase I and II

⁴⁸⁴ "Hazard Mitigation in a Historic Context."

⁴⁸⁵ "Preservation Partnerships."

of the planning process were weak in education and training for private property owners as well as climate change planning. Only once in SHPO's blog do they mention that the threat of natural hazards is increasing,⁴⁸⁶ but they do not discuss why throughout the planning process or in the Phase I reports. The surveys did not include any climate change management options such as scenario planning and the only adaptation actions discussed were "improving the resilience/resistance of resource". Phase I of the initiative emphasized identifying vulnerable historic resources in the 100-year and 500-year floodplains, but as I discussed in Chapter 3, the 100-year model for disaster management no longer applies because climate change is increasing the frequency and severity of storms. Their neglect to plan for the effects of climate change may be more damaging as climate change increases the risk of flooding and sea level rise.

The 2017 hurricane season had six hurricanes reach a category 3 or higher. Creating mitigation actions to protect vulnerable historic properties in these four counties is important, but so are alternative management options and adaptation actions for climate change effects. Historic properties and structures are not the only vulnerable resources in Pennsylvania under threat from natural hazards, and the state experiences other hazards besides flooding. Traditional methods of mitigation such as temporary flood proofing measures may no longer be enough to protect these vulnerable resources. Saving these resources may also not always be feasible and the disaster planning initiative should include methods to document these properties if their loss becomes inevitable.

At the current time in Pennsylvania, the disaster planning initiative does not seem to be planning for the effects of climate change on historic properties; however, this planning process is a step in the right direction toward disaster management of historic properties at the county level. Pennsylvania as a whole is no stranger to studying natural hazard threats to historic properties.

⁴⁸⁶ "Hazard Mitigation in a Historic Context."

FEMA, the Pennsylvania Emergency Management Agency (PEMA) and the Pennsylvania Historical and Museum Commission (PHMC) collaborated on the 2002 *Looking to the Future: Alternatives for Reducing Flood-Related Damage in Historic Communities* study of Milton, Pennsylvania as an early look at how frequent flooding events affect historic districts at the local level.⁴⁸⁷ Today, the most recent Pennsylvania SHPP describes all the historic and cultural resources present in the state and notes that some resources, namely archaeological sites, are often overlooked in planning processes.⁴⁸⁸ While the SHPP does not focus on disaster management specifically, it does briefly discuss the importance of prioritizing historic and archaeological sites because some may be at risk of damage or loss.⁴⁸⁹ The SHPP also includes an Action Agenda for implementing the plan. Three out of the four action agenda goals include crowdsourced tips that suggest hazard mitigation planning for historic properties;⁴⁹⁰ illustrating that there is an interest to continue these efforts throughout the state.

In addition to a brief review of the SHPP, my content analysis also included a review of the individual county hazard mitigation plans of the four pilot counties. While Phase I of the disaster planning initiative focused solely on the risk of flooding and sea-level rise in these four counties, the HMPs included all hazards and their locations throughout the county. The HMPs also included climate change as a risk and described how it is increasing nearly every hazard.⁴⁹¹ All four plans also mentioned historic preservation professionals present on the planning committee including staff from the PHMC.⁴⁹² Philadelphia's plan also included a brief inventory

⁴⁸⁷ "Before the (Next) Storm."

⁴⁸⁸ "Community Connections: Planning for Preservation in Pennsylvania," 49.

⁴⁸⁹ "Community Connections: Planning for Preservation in Pennsylvania," 54.

⁴⁹⁰ "Community Connections: Planning for Preservation in Pennsylvania," 57, 61, 65.

⁴⁹¹ Tetra Tech, Inc., "Bedford County Hazard Mitigation Plan 2017 Update," 4.24-4.4-1; MCM Consulting Group, Inc., "Cameron County 2017 Hazard Mitigation Plan," 32-134; "City of Philadelphia All Hazard Mitigation Plan," 80-86 & 90-250; MCM Consulting Group, Inc., "Monroe County 2016 Hazard Mitigation Plan," 36-154.

⁴⁹² Tetra Tech, Inc., "Bedford County Hazard Mitigation Plan 2017 Update," 3-8; MCM Consulting Group, Inc., "Cameron County 2017 Hazard Mitigation Plan," 16; "City of Philadelphia All

of major cultural and historic institutions in the city.⁴⁹³ Through other planning documents, Philadelphia has demonstrated that it is aware of the importance of planning for climate change. In 2015, Philadelphia published *Growing Stronger: Toward a Climate-Ready Philadelphia*. The report identified the city's vulnerabilities to climate risk, low-risk adaptation options, and existing climate resilient strategies.⁴⁹⁴ The plan itself is not historic preservation specific but it mentioned the risks faced by the city's historic properties and the need to create climate change-driven mitigation strategies for those resources.⁴⁹⁵

Although not fully comprehensive, Phase I and II of the Disaster Hazard Planning Initiative show promise in planning for historic resources in the state of Pennsylvania. Considering the planning process is still not finalized, the initiative can combine the tools developed through the surveys with the information included in the individual county mitigation plans to better prepare historic properties for the effects of climate change. If the planning initiative is then applied to the remaining cultural and historic resources described in the SHPP, the initiative piloted in these four counties can truly be successful in protecting historic resources in the rest of the state.

Florida's Disaster Planning and Mitigation Guide

Florida has been a leader in working with local communities to develop disaster planning, response, and mitigation methods because of the many natural and man-made hazards the state

Hazard Mitigation Plan," 67; MCM Consulting Group, Inc., "Monroe County 2016 Hazard Mitigation Plan," 18–20.

⁴⁹³ "City of Philadelphia All Hazard Mitigation Plan," 62.

⁴⁹⁴ The Mayor's Office of Sustainability and ICF International, "Growing Stronger: Toward a Climate-Ready Philadelphia" (Philadelphia, 2015), 9, <https://www.phila.gov/media/20160504162056/Growing-Stronger-Toward-a-Climate-Ready-Philadelphia.pdf>.

⁴⁹⁵ The Mayor's Office of Sustainability and ICF International, 47.

encounters.⁴⁹⁶ In response to the 2004 and 2005 hurricane seasons that resulted in four storms and approximately \$23 billion in losses for the state, The Florida Department of State Division of Historic Resources (Florida SHPO), the Florida Division of Emergency Management, and 1000 Friends of Florida began an effort to better integrate historic properties into disaster management.⁴⁹⁷ This effort resulted in the publication of two manuals, *Disaster Planning for Florida's Historic Resources* in 2006 and *Disaster Mitigation for Historic Structures: Protection Strategies* in 2008. Although these two documents are more like disaster planning manuals than actual disaster management plans, they include or recommend many of the planning elements described in my assessment checklist (Appendix B).

The disaster planning manual begins with a review of the historic resource programs and legislation present at all levels of government including the NHPA, NEPA, the NRHP, the Florida Department of State Division of Historic Resources, THPO, as well as CLGs and Main Street programs.⁴⁹⁸ It also reviews emergency management programs and legislation including those specific to Florida such as the local Emergency Support Function Matrix and the Local Mitigation Strategy. The manual emphasizes the importance of the disaster planning cycle by noting that emergency management programs prioritize pre-planning disaster response and recovery to prevent damage from future storms.⁴⁹⁹ The integration of historic properties into disaster pre-planning is stressed with flowcharts and guidelines regarding the Section 106 review

⁴⁹⁶ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Planning for Florida's Historic Resources: Including Case Studies," May 2006, 3, <https://dos.myflorida.com/media/697180/fdem-disaster-planning-for-florida-historic-resources.pdf>.

⁴⁹⁷ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Mitigation for Historic Structures: Protection Strategies," August 2008, 1, <https://dos.myflorida.com/media/697182/fdem-disaster-mitigation-for-historic-structures.pdf>.

⁴⁹⁸ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Planning for Florida's Historic Resources: Including Case Studies," 5–7.

⁴⁹⁹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 10–11.

process and the Secretary of the Interior's Standards for the Treatment of Historic Properties (Figures 5.2 & 5.3).⁵⁰⁰ The inclusion of regulatory guidelines illustrate that Florida is aware of the cultural heritage and disaster management resources present at the state and federal level. By including the various agencies and providing information on Section 106 and the Secretary of the Interior's Standards, Florida promotes the integration of these two fields.

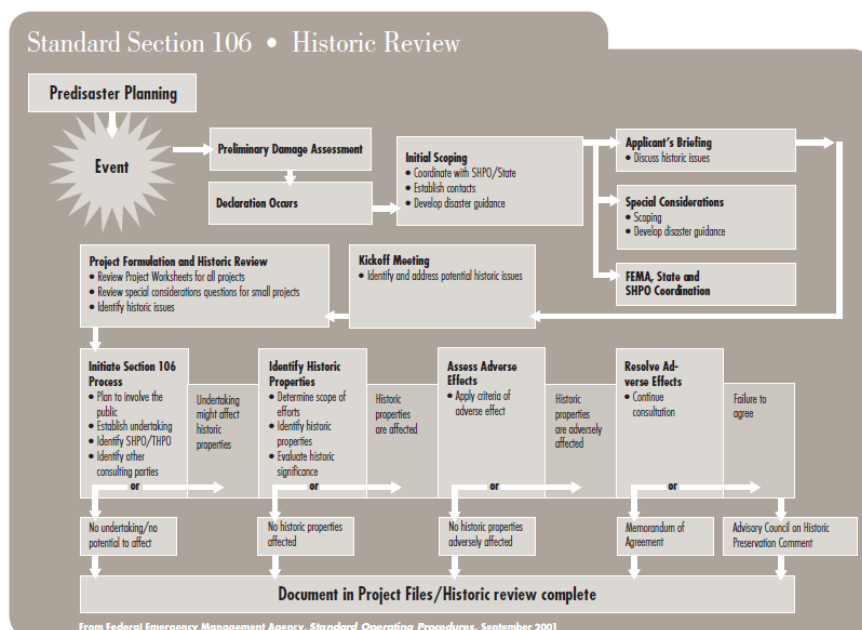


Figure 5.2: Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, Standard Section 106 Historic Review, in Disaster Planning for Florida's Historic Resources: Including Case Studies, <https://dos.myflorida.com/media/697180/fdem-disaster-planning-for-florida-historic-resources.pdf>, 13, (accessed March 5, 2018).

⁵⁰⁰ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Mitigation for Historic Structures: Protection Strategies," 13–14.

Secretary of the Interior's Standards for Rehabilitation

Historic buildings need special treatment. Pre-disaster mitigation and recovery/rehabilitation of historic structures must be done appropriately to ensure that the distinctive character and fabric of the property is not lost. Implementing the following Ten Principles, known as the Secretary of the Interior's Standards for Rehabilitation, will help:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques, or techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archaeological features affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

A good resource is "Electronic Rehab," an interactive web class on The Secretary of the Interior's Standards for Rehabilitation, available at www.cr.nps.gov/hps/tps/e-rehab/index.htm.

Figure 5.3: Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, Secretary of the Interior's Standards for Rehabilitation, in *Disaster Planning for Florida's Historic Resources: Including Case Studies*, <https://dos.myflorida.com/media/697180/fdem-disaster-planning-for-florida-historic-resources.pdf>, 14, (accessed March 5, 2018).

Florida's manual mentions FEMA's Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning Guide as a resource.⁵⁰¹ Following FEMA's recommendations, Florida's manual briefly reviews all types of historic resources present throughout the state and includes recommendations for the treatment of archaeological sites.⁵⁰² This information includes the importance of not disclosing site locations to the public in order to protect the integrity of the site from looters.⁵⁰³

Although much of the manual's planning and mitigation recommendations focus on hurricanes as the number one hazard to the state, the manual mentions other hazards present in

⁵⁰¹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Planning for Florida's Historic Resources: Including Case Studies," 16.

⁵⁰² Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 8–9.

⁵⁰³ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 22.

Florida including fires, flooding, and terrorism.⁵⁰⁴ The manual does not include a risk assessment of these hazards or a historic inventory because these are planning documents and are not actual disaster plans. It provides general recommendations for assessing potential monetary loss and tourism revenue for historic structures.⁵⁰⁵ Emphasizing that historic resources have economic benefits as well as cultural value is essential to applying recovery funding and resources after a disaster event. The economic benefits of climate change and disaster planning for historic properties could also justify why the Trump Administration should take heed of these issues.

As one of the first planning steps, Florida's disaster planning guide recommends creating an up-to-date historic site inventory that includes such information as location of resource, type of resource, condition, any distinguishing characteristics, and date of construction.⁵⁰⁶ In addition, it discusses state-specific resources such as the Florida Master Site File (FMSF). This resource includes much of this same information on historic buildings, cemeteries, archaeological sites, and bridges as well as whether they are listed or eligible for listing on the NRHP.⁵⁰⁷ Due to many recent hurricane impacts, Florida is aware of the importance of inventories in disaster planning by connecting state specific resources to help keep the inventory information as comprehensive and up-to-date as possible.

If funding for planning is limited, the manual also discusses how to prioritize an inventory and mitigation actions. NRHP-listed or eligible structures are prioritized, then the locally designated resources, and finally structures that are 50 years or older or have achieved

⁵⁰⁴ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 47.

⁵⁰⁵ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 21.

⁵⁰⁶ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 21.

⁵⁰⁷ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 22.

historic significance within the last 50 years.⁵⁰⁸ Florida also recommends utilizing disaster management resources such as GIS based flood mapping and hurricane modelling programs to prioritize the identified resources based on vulnerability to hazards and feasibility of mitigation actions.⁵⁰⁹ Creating and updating a historic resource inventory and connecting that inventory to disaster management planning tools forms the building blocks of hazard and risk assessment for disaster mitigation of historic properties.

One of the strongest elements of Florida's disaster planning manuals are the mitigation recommendations and actions. The Disaster Planning guide includes mitigation "do's and don'ts". The "do's" include examples such as elevating utilities, inspecting building features for weaknesses and making repairs when necessary. The "don'ts" include examples such as installing protection systems that damage the historic character or altering the historic character defining features.⁵¹⁰ The manual also includes a list of funding resources from FEMA, historic preservation organizations, state and local agencies as well as eligibility requirements for funding based on property ownership.⁵¹¹ For example, private homeowners are only eligible for small business grants as well as individual and household grants, but public agencies and institutions are eligible for FEMA Public Assistance and Hazard Mitigation Grants.⁵¹² Identifying what funding a historic building is eligible for before a disaster event assists in efficient funding allocation during recovery.

⁵⁰⁸ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 24.

⁵⁰⁹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 42.

⁵¹⁰ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 50.

⁵¹¹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 52–57.

⁵¹² Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 54.

As a valuable mitigation tool, the manual also recommends scheduling ongoing maintenance and upkeep at historic sites.⁵¹³ Well-maintained historic buildings better withstand disaster events and are more cost-effective to restore after an event. Archaeological site upkeep and mitigation actions include, but are not limited to, the stabilization of the site to protect it from flooding, storm surge, and high winds.⁵¹⁴

In addition to the “do’s and don’ts”, Florida SHPO, the Florida Division of Emergency Management, and 1000 Friends of Florida produced a separate manual specifically devoted to mitigation actions. All the recommended mitigation actions adhere to the Secretary of the Interior’s Standards for the Treatment of Historic Properties. Focusing on specific elements of historic buildings such as roofs, windows, doors, as well as walls and foundations, the manual provides recommended and not recommended actions for stabilization and repair of these historic features. The manual reviews mitigation options for roofs first as the first line of defense for a building against flooding and high winds.⁵¹⁵ The manual recommends replacing historic materials in-kind or with materials as similar as possible to the original historic fabric.⁵¹⁶ It also focuses on the importance of securing doors and windows to prevent debris and flood inundation.

The manual also includes temporary stabilization measures for historic buildings in the event of natural hazards. Hurricane clips and straps are recommended for the stabilizations of roofs, as long as they are used in an “unobtrusive manner”.⁵¹⁷ For windows and doors, panel options include manufactured storm panels and plywood panels as a cheap and easy mitigation

⁵¹³ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 34.

⁵¹⁴ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 36.

⁵¹⁵ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, “Disaster Mitigation for Historic Structures: Protection Strategies,” 17–20.

⁵¹⁶ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 2.

⁵¹⁷ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 19–20.

method.⁵¹⁸ These guidelines include what architectural styles are appropriate as well as photo examples of the actions used throughout the state.⁵¹⁹ Although the planning guide included a brief description of mitigation options for archaeological sites, the mitigation guide itself only focuses on historic properties. However, since this guide is for private property owners, individuals who typically would not be involved with the management of archaeological sites, the technical assistance provided in the mitigation guide is sufficient.

For further information and technical assistance, the mitigation guide includes links to FEMA and NPS webpages at the end of each feature section as well as a list of CLGs present throughout Florida.⁵²⁰ The planning guide also discusses funding and protection issues specific to Florida, namely, the difficulty of obtaining property insurance due to the state's hurricane vulnerability. The nature of historic houses makes obtaining this type of insurance more complicated and the planning guide includes resources such as the NTHP and state-specific resources.⁵²¹ Providing the unique circumstances that Florida faces and connecting those issues to historic and disaster resources is a valuable tool for disaster planning at the individual, local, and state level.

The disaster management manual also provides guidelines for recovery and response actions taken after a disaster event. Florida's manual includes recommendations for creating a Historic Preservation Response Network as well as providing emergency management and historic preservation procedure cross-training for all members of the team. This training includes reviewing FMSFs to select sites where disaster-staging operations take place. By consulting with

⁵¹⁸ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 23–25.

⁵¹⁹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 47–57.

⁵²⁰ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 58–63.

⁵²¹ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, "Disaster Planning for Florida's Historic Resources: Including Case Studies," 35.

historic preservation professionals such as architectural historians and archaeologists, the Historic Preservation Response team ensure that they are not damaging historic sites while recovery efforts are ongoing.⁵²² To emphasize the importance of salvaging historic building materials, the manual also includes brief guidelines regarding debris management and storage after a disaster event. The Historic Preservation Response Network should save unique character defining building features whenever possible for reference when repairing the building.⁵²³ Including recommendations for debris management and the creation of a Historic Preservation Response team demonstrates that Florida is aware of disaster management planning, survey, mitigation, and recovery.

While Florida's disaster management guide and disaster mitigation manual provide guidelines for essential disaster management tools such as creating an inventory, specific mitigation strategies, and responding after a disaster event, there are no mentions of climate change planning. Only once in the plan do they mention an increase in frequency and severity natural hazards,⁵²⁴ with no reference to the cause. Including planning for the effects of climate change as well as alternative management options such as accepting the loss of a historic site is now essential in disaster planning for historic properties. The recovery costs for Florida's natural heritage sites such as the Keys and the Everglades after the 2017 and 2018 Hurricane seasons demonstrates that Florida's SHPO needs face the deliberate loss of sites.

In addition to the lack of discussion on climate change, the planning manuals also do not include much discussion on sites related to tribal history other than a brief mention of THPOs as a historic resource. Florida has tribes present in the state who are planning for the effects of climate

⁵²² Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 44 & 46.

⁵²³ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 45.

⁵²⁴ Division of Historical Resources Florida Department of State, Division of Emergency Management Florida Department of Community Affairs, and 1000 Friends of Florida, 45.

change on their historic resources. The Seminoles of the Everglades and the small island of Egmont Key are endangered from sea level rise and other environmental factors.⁵²⁵ The Seminoles have negative heritage associated with Egmont Key; the small island is tied to the imprisonment and the deportation of their people to the western United States, many of whom did not survive the journey.⁵²⁶ As a community, they are working to preserve elements of history threatened by the effects of climate change, although many within the Seminole Tribe questioned whether they want to preserve this specific heritage.⁵²⁷ Ultimately, Tribe members, archaeologists, and the THPO decided that they should use any means necessary to save the island and its connection to their history.⁵²⁸ In 2015, the USACE committed \$38.6 million to combat erosion on the island.⁵²⁹ In addition to the erosion of Egmont Key, the Seminole tribe and their home in the Everglades were inundated by Hurricane Irma in 2017.⁵³⁰

Part of the reason these disaster planning manuals for historic resources do not include climate change as a risk factor is the timeframe when they were written. Florida published their disaster planning guide in 2006 and released the mitigation guide two years later in 2008; many years before FEMA added climate change as a requirement for State Disaster Mitigation Plans in 2015. Much like Pennsylvania's HMP, Florida's current plan includes climate change as a hazard and how it affects each hazard that impacts the state.⁵³¹ The HMP also emphasizes integrating

⁵²⁵ Paul N. Backhouse, "Made from the Sands of Florida: Egmont Key, Section 106, Climate Change, and the Seminole Tribe of Florida," *SAA Archaeological Record* 18, no. 1 (January 2018): 27.

⁵²⁶ Backhouse, 26.

⁵²⁷ Backhouse, 27.

⁵²⁸ Backhouse, 29.

⁵²⁹ Backhouse, 29.

⁵³⁰ United States. Department of the Homeland Security. Federal Emergency Management Agency, "2017 Hurricane Season FEMA After-Action Report," v.

⁵³¹ Florida Division of Emergency Management, "Enhanced State Hazard Mitigation Plan State of Florida," 2018, 89–419, <https://www.floridadisaster.org/contentassets/c6a7ead876b1439caad3b38f7122d334/shmp-2018-full-02-23-2018.pdf>.

climate change and sea-level rise research into state and local planning efforts.⁵³² Florida's planning and mitigation guides were comprehensive at the time they were written, but now that research and disaster planning objectives have changed, these resources should be updated. The Seminole Tribe have already shown consideration for planning for the potential loss of historic sites at the local level, even though this is not the path the tribe chose. If 1000 Friends of Florida, The Florida Department of State, Division of Historic Resources, and the Florida Division of Emergency Management work together to update these documents in conjunction with the state's climate change planning efforts, these guides could be used as best practices for other state and local guides.

The City of Annapolis, “Weather it Together”

Another example of local governance integrating historic preservation and disaster management is Annapolis, Maryland. In 1965, downtown Annapolis was designated a National Historic Landmark by the DOI; a distinction shared by only 42 other districts throughout the US at the time.⁵³³ Annapolis has also been the site of climate change action. In 2015, the Congressional Forum “Climate Change at the Water's Edge” took place in the city; bringing together city, state, and federal government leaders to discuss the effects of flooding on coastal communities and climate change's threat to national security.⁵³⁴ In response to these climate change planning efforts, the city began the process to incorporate cultural resources and historic properties into their HMP. Unlike the other local and state plans analyzed in this assessment, Annapolis developed their Cultural Resources Hazard Mitigation Plan (CRHMP) with the direct purpose of responding to the effects of climate change on their city.

⁵³² Florida Division of Emergency Management, 6.

⁵³³ Don M. Bain et al., ““Weather it Together”: A Cultural Resource Hazard Mitigation Plan for the City of Annapolis,” April 2018, 1, <https://www.annapolis.gov/DocumentCenter/View/10064/Consolidated-CRHMP-Report-April-2018>.

⁵³⁴ Bain et al., 26.

The ultimate goal of creating this CRHMP was to integrate it into the city's HMP and to serve as a model community-based planning approach for other historic coastal communities.⁵³⁵ Annapolis' CRHMP works to accomplish this by utilizing resources provided by historic preservation organizations and disaster management organizations. The planning process followed the exact steps outlined in FEMA's Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning Guide discussed in Chapter 2. The CRHMP also utilized NRHP guidelines to conduct an intensive level survey of historic resources within the identified survey area. The survey utilized data sheets to detail the significant building characteristics including construction date, use, number of stories, structural system, exterior material, condition, and whether it has a basement.⁵³⁶ Taking advantage of these two planning tools ensures that Annapolis adhered to established best practices for disaster planning of historic properties.

Annapolis' CRHMP also connected planning efforts with national and international resources. The CRHMP utilized information from FEMA and the NFIP regarding flood adaptations and keeping flood risk data up-to-date.⁵³⁷ Annapolis collaborated with NOAA, the National Weather Service, the National Climate Assessment, the Union of Concerned Scientists, United States Naval Academy and the USACE for resources on climate change projections and planning.⁵³⁸ For best practices on climate change planning for historic resources, Annapolis collaborated with the NPS and the US branch of ICOMOS.⁵³⁹ To develop guidelines for the CRHMP, Annapolis used the UN's Sendai Framework for Disaster Risk Reduction 2015-2030, the Maryland Climate Change Commission, and the Maryland HMP as models.⁵⁴⁰ Collaborating

⁵³⁵ Bain et al., 41.

⁵³⁶ Bain et al., 60.

⁵³⁷ Bain et al., 67.

⁵³⁸ Bain et al., 38 & 51.

⁵³⁹ Bain et al., 51.

⁵⁴⁰ Bain et al., 65.

with other agencies at the state, national, and international level provides information and models that are necessary to build a sustainable response that effectively protects historic resources from climate change.⁵⁴¹

While the planning process and survey tools used to create the Annapolis plan's inventory followed best practices, the hazard identification and risk assessment was limited. Although the plan mentioned other hazards present in the city such as urban fire, earthquakes and tornadoes, the CRHMP's hazard assessment focused solely on the city's number one hazard, flooding. Utilizing the city's 2015 Flood Insurance Rate Map (FIRM) and GIS to identify the low-lying areas of the city, the planning team delineated the most vulnerable area of the city that fell within the 1% and .2% annual chance floodplains.⁵⁴²

Annapolis' plan was also the first one in my thesis study to include an inventory of historic resources within the plan. Within that inventory, certain properties were noted as non-contributing structures and others were prioritized as "High Community Value" through public surveys and workshops.⁵⁴³ FEMA's planning guide includes "Organize Resources" as step one because having an inventory of what resources are extant is one of the basic tools of creating a disaster plan. To emphasize how these resources contribute to the local community, the CRHMP also included the economic value of these resources. Detailing the benefits of heritage tourism, jobs, and revenue, the CRHMP provided the total assessed value of the study area if it were lost to a natural disaster event.⁵⁴⁴ As discussed in Chapter 2, when recovery efforts were underway in post-Hurricane Katrina New Orleans, the ability to measure the value of historic and cultural resources was difficult because market value did not determine their significance. Having a

⁵⁴¹ National Park Service, "Cultural Resources Climate Change Strategy," 5.

⁵⁴² Bain et al., "Weather it Together", 15.

⁵⁴³ Bain et al., Appendix E.

⁵⁴⁴ Bain et al., 20.

concrete monetary value of what would be lost if these resources are damaged or destroyed helps in planning efforts, especially when it comes to applying for recovery funds in the future.

The CRHMP also focused on the effects of sea-level rise (SLR) on the coastal city. Utilizing scenario planning, Annapolis' plan discussed the consequences estimated for the city based on the projections of two NOAA SLR scenarios. NOAA SLR Scenarios are named for the number of meters of global sea level rise by the year 2100; NOAA 2017 SLR Scenarios 1.0 (i.e., 1.0 meters of global SLR) and 2.5 (i.e., 2.5 meters of global SLR) were chosen for Annapolis Scenario Planning (Figure 5.4).⁵⁴⁵ However, as climate change effects cannot be fully estimated due to unpredictable natural conditions, Annapolis intends to reassess these climate projections as the plan is implemented as well as when it is updated in five years.⁵⁴⁶

In 2008, The Governor's Commission on Climate Change issued Maryland's Climate Change Action Plan, which identified three possible ways the state could respond to SLR: protect, retreat/relocate, and abandon. Because of the historic significance of Annapolis' Historic District, the city chose to protect their historic resources,⁵⁴⁷ with the exception of archaeology sites. The CRHMP included mitigation actions to stabilize and protect archaeological sites; however, if none of these options are viable, the city will conduct a Phase III survey to document the site before it is lost.⁵⁴⁸ Annapolis' plan is the only one in my thesis study to include projections for SLR and the impact on the city's resources. This information, combined with the acknowledgement that some archaeological sites may be lost, highlights that Annapolis utilized best practices for climate change management options in their city's CRHMP. These options help ensure that while some resources may be lost, the information they provide to the nation's overall

⁵⁴⁵ Bain et al., 37.

⁵⁴⁶ Bain et al., 36–37.

⁵⁴⁷ Bain et al., 26–27.

⁵⁴⁸ Bain et al., 121–22.

history will not and that disaster management efforts can be prioritized for resources that can be saved.

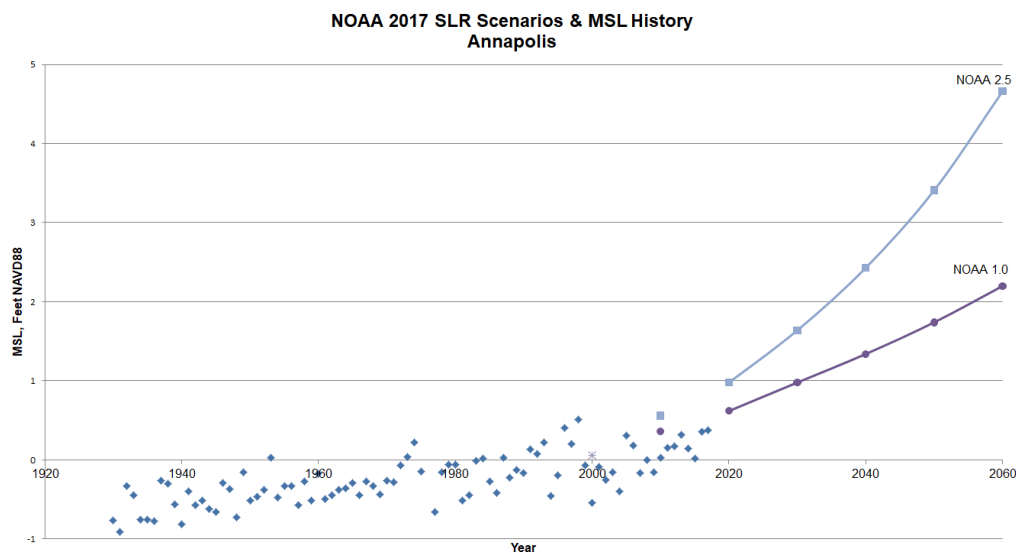


Figure 5.4: Bain et al., NOAA SLR Scenarios and MSL (mean sea level rise) History Annapolis, “Weather it Together”: A Cultural Resource Hazard Mitigation Plan for the City of Annapolis, <https://www.annapolis.gov/DocumentCenter/View/10064/Consolidated-CRHMP-Report-April-2018>, 37, (accessed August 15, 2018)

One of the strongest elements of Annapolis’ CRHMP is the alternative mitigation actions outlined as project areas. Many of these actions mirror the Hard, Soft, and Non-structural adaptation methods discussed in Chapter 3.⁵⁴⁹ In fact, the plan described the natural adaptation measures underway throughout the city as “soft” measures. These soft adaptation measures for Annapolis include green infrastructure such as rain gardens that capture water and reduce flooding risk throughout the city.⁵⁵⁰ The hard adaptations proposed for the city include structural measures such as raising existing infrastructure along the waterway, improving the city’s storm drainage system, and installing permanent or semi-permanent flood barriers.⁵⁵¹ While a permanent or semi-permanent floodwall can help improve an area’s flood-risk, the unique circumstances of a historic district must be taken into account. The barrier’s presence and design

⁵⁴⁹ Horowitz, “Planning before Disaster Strikes: An Introduction to Adaptation Strategies,” 43.

⁵⁵⁰ Bain et al., “Weather It Together,” 88.

⁵⁵¹ Bain et al., 89–91.

may not harmonize with the district's aesthetics and it cannot interfere with the district's historic waterfront view.⁵⁵² In addition to these infrastructure improvements, Annapolis' CRHMP also discussed flood preparedness best practices for individual buildings by providing information on preventative maintenance, enhanced retrofitting, and preventative rehabilitation to private property owners.⁵⁵³ These practices included the importance of regular maintenance and upkeep as one of the most cost-effective ways to make a historic structure more resilient to future disaster events.

A less cost effective and more challenging option discussed in Annapolis' CRHMP is the elevation of historic structures. The plan outlined the cost associated with elevation and focused on minimizing the visual impact as much as possible. As an adaptation measure, the plan suggested including the elevation as part of the interpretative narrative history of the structure. For example, at the beginning of the 20th century one of Annapolis' historic homes was elevated, this elevation is now included in the house's history.⁵⁵⁴ Utilizing adaptation options such as interpreting the change of a resource due to climate change allows more drastic measures like the elevation of historic structures to take place while ensuring that the building's historic integrity and narrative is not lost.

The remainder of the adaptation options in Annapolis' CRHMP primarily focused on non-structural options. Engaging the public through various workshops, meetings, and lectures helped the "Weather it Together" planning team spread the message regarding the importance of flood preparedness and the need to act now.⁵⁵⁵ Other more long-term planning options included changes to city plans and policies. Updating the city's Comprehensive Plan to include the risks of SLR ensures that land use, economic development, environmental, and transportation policies

⁵⁵² Bain et al., 91–92.

⁵⁵³ Bain et al., 81.

⁵⁵⁴ Bain et al., 81–82.

⁵⁵⁵ Bain et al., 96.

reinforce the objectives and goals outlined in the city's HMP and the CRHMP.⁵⁵⁶ Building codes, zoning laws, and historic property tax incentives that encourage hazard mitigation for private property owners and businesses also help protect the integrity of historic sites and economic benefits they provide.⁵⁵⁷ By including non-structural policy methods that encourage and incentivize hazard mitigation planning, Annapolis ensures the reinforcement of best practices for climate change planning for historic properties throughout the city.

Overall, Annapolis' CRHMP is the most comprehensive of the three plans assessed. "Weather it Together" adheres to the best practices for planning for the effects of climate change on historic resources outlined by FEMA and NPS because it is modeled after many of the same resources used to create my assessment checklist. The plan acknowledged the threat of climate change to the city and its resources, and estimated the potential economic losses with SLR scenarios provided by NOAA. Utilizing climate change and historic preservation resources from state, national, and international organizations contributed to the plan's sustainable long-term response efforts. Including management options and adaptation actions in addition to mitigation strategies allowed the plan to address the threat of climate change. By prioritizing resources, "Weather it Together" recognizes that not every site can be preserved and the best efforts will be undertaken to protect and document historic and archaeological sites. Hard, soft, and non-structural adaptation actions proposed throughout the city represent long-term planning essential to protect both historic and non-historic resources that contribute to Annapolis' quality of life and economy.

The few areas where the plan could improve are those which relate to recommended hazard planning and inclusion of other historic resources. Climate change is increasing the severity and frequency of all natural hazards, but "Weather it Together" limited their hazard

⁵⁵⁶ Bain et al., 108.

⁵⁵⁷ Bain et al., 102–5 & 114–15.

assessment to flooding and sea-level rise. While this is Annapolis' number one threat, other hazards that can affect historic properties should be assessed and taken into account. Drought can increase the risk of fire, extreme heat and cold can cause power outages and loss of climate control, and snow and ice from severe winter storms can damage building features. In addition to estimating the effects of other hazards, the CRHMP also mainly focuses on historic properties.

Although the plan included mitigation strategies and adaptation options for archaeological sites and it mentions cultural landscapes, it does not discuss other cultural resources such as cemeteries or tribal resources. Tree fall and equipment used to clean up debris after a disaster event can damage historic cemeteries and Annapolis contains a number of vulnerable historic cemeteries including Annapolis National Cemetery established in 1862. Regarding the treatment of tribal resources, Maryland does not have a THPO or federally recognized tribes, but they do have Native American culture and history present. In 2012, Maryland formally recognized The Piscataway Indian Nation and Piscataway Conoy Tribe with Maryland Indian Status. Today, the Maryland Commission on Indian Affairs serves eight indigenous tribes present in the state.⁵⁵⁸ These resources should also be taken into account in disaster planning efforts. With more funding opportunities, hopefully Annapolis' CRHMP will integrate these missing elements to truly be an example of best practices for climate change planning of cultural and historic resources. Ultimately, as it exists now, "Weather it Together" is an almost fully comprehensive example of best practices that could be replicated in other historic coastal cities such as Ellicott City, Maryland.

⁵⁵⁸ "American Indian Tribes Today - Captain John Smith Chesapeake National Historic Trail (U.S. National Park Service)." Accessed August 29, 2018. <https://www.nps.gov/cajo/learn/historyculture/american-indian-tribes-today.htm>.

Located on the Patapsco River, Ellicott City's Historic District has experienced two major floods since 2016.⁵⁵⁹ In response to these disaster events, the city has proposed a 5-year, \$50 million demolition plan that would destroy 5% of the historic district.⁵⁶⁰ The city's plan intends to mitigate ongoing flood issues and includes measures for the appropriate Section 106 reviews that would need to take place.⁵⁶¹ Preservation groups worry that instead of mitigating flood risks; it will create new flood patterns and will result in the de-listing of Ellicott City's Historic District from the NRHP.⁵⁶² The Ellicott City's proposal is an example of reactive disaster preparedness, the city could have benefitted from disaster pre-planning like "Weather it Together".

Conclusion

Florida and Annapolis' plans as well as Pennsylvania's planning process assessed in this chapter discuss an individual state's, four counties', and a city's efforts to protect historic and cultural resources from natural hazards. While they all adhere to the basics of disaster planning, only Annapolis' plan focuses on the growing threat of climate change. This is partly due to lack of funding and resources as well as a need to update the plans. Florida and Pennsylvania's hazard mitigation plans include climate change in their hazard assessments, but Florida's manuals are a decade old. Clearly, the state and counties are aware of the threat of climate change but this

⁵⁵⁹ "Plan to Tear down Ellicott City Buildings Raises Preservation Concerns - The Washington Post," accessed October 24, 2018, <https://www.washingtonpost.com/>.

⁵⁶⁰ Preservation Maryland, "Preservation Maryland Statement on Ellicott City Demolition Proposal," Preservation Maryland, accessed October 24, 2018, <http://www.preservationmaryland.org/preservation-maryland-statement-on-ellicott-city-demolition-proposal/>.

⁵⁶¹ Preservation Maryland, "Federal Agency Asks Important Questions about Ellicott City Demolition Plan," Preservation Maryland, accessed October 24, 2018, <http://www.preservationmaryland.org/federal-agency-asks-important-questions-about-ellicott-city-demolition-plan/>.

⁵⁶² Maryland, "Preservation Maryland Statement on Ellicott City Demolition Proposal."

knowledge did not translate directly to their plans to protect historic resources. Annapolis, Maryland has the most comprehensive disaster mitigation plan for cultural resources, but even “Weather it Together” has gaps in planning for multiple hazards and types of resources.

The best practices for integrating climate change planning into disaster management for historic properties determined by my assessment checklist were based on information established by FEMA and the NPS and consisted of the following elements:

- **The Planning Process:**
The Planning Process should include the basic guidelines for creating a hazard mitigation plan based on FEMA publications. Historic property and cultural resource specific guidelines such as considerations for Section 106 review should also be included to adapt the hazard planning guidelines to their unique needs. Based on feedback I received from NJ SHPO staff, the planning process should also include considerations for state and local regulatory historic reviews similar to Section 106. Additionally, this element should include the consideration of climate change impacts on historic resources based on guidance from the NPS’ CRCC.
- **Hazard Identification and Risk Assessment:**
Hazard Identification and Risk Assessment is another basic hazard mitigation planning tool based on FEMA publications. Risk assessment guidelines should include inventorying vulnerable historic properties located in hazard areas as well as estimating their economic value to the state, county, or city. This element should also emphasize the importance of prioritizing vulnerable historic and cultural resources, documenting a baseline for them, monitoring their “vital signs”, and documenting every type of historic resource. While these planning guidelines are not climate change specific, they are essential to the disaster management of historic resources. As climate change increases the frequency of major disaster events, hazard mitigation and risk assessment for historic resources will become best practices for climate change planning.
- **Mitigation Strategy and Priorities:**
Another key element of disaster planning is mitigation; once hazards are identified in the risk assessment, strategies need to be established to mitigate them. For historic properties and cultural resources, best practices for mitigation strategies include training for those involved in the care and maintenance of historic resources as well as compliance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties.
- **State Mitigation Capabilities:**
Disaster planning for historic resources requires funding and technical support from state agencies. Best practices for disaster planning for historic resources should evaluate state and local programs as well as legislation to ensure the whole community is planning for the effects of climate change on historic resources.
- **Management Options:**
Management Options and the next element, Adaptation Actions and Options, are exclusively related to integrating climate change planning into disaster management of historic resources. Best practices utilizing management options focuses on climate

change planning such as scenario planning for different SLR scenarios. It also emphasizes the importance of considering the loss of vulnerable historic sites and resources as well as the need to identify and document them.

- **Adaptation Actions and Options:**
Adaption Actions and Options also includes documenting vulnerable resources and preparing for their loss in addition to other adaptation options. Climate change planning must include methods and guidance for long-term adaptation approaches such as improving the resilience of a historic resource or relocation of the resource to ensure that they comply with the Secretary of the Interiors' Standards for the Treatment of Historic Properties. Additionally, Adaptation Actions and Options best practices should include possible constraints and opportunities to long-term adaptation approaches such as lack of funding or technological resources.
- **Plan Review, Evaluation, and Implementation:**
To ensure a hazard mitigation plan for historic resources is effective it must remain up-to-date. The plan must include methods and schedules for reviewing the plan, the historic inventory, as well as the latest climate change projections to ensure that the risk assessment, mitigation strategies, and adaptation options are executed based on the most accurate information.
- **Local Coordination and Mitigation Capabilities:**
Similar to the state's mitigation capabilities, local and tribal mitigation capabilities must also be evaluated to ensure funding is prioritized appropriately and the whole community is cooperating in climate change planning.
- **Integrated Planning:**
Best practices for Integrated Planning ensures that the most up-to-date climate change and cultural heritage information is shared by local, regional, national, and international organizations.

Climate change effects must be included in disaster management to address historic and cultural resource vulnerabilities. While creating mitigation actions is easiest for historic properties based on the very nature of the built environment, structures are not the only cultural resources. Archaeological sites, cultural landscapes, cemeteries, and tribal resources should be inventoried and included in the planning process. Because the federal government is no longer assessing the threat of climate change in relation to natural hazards, states and local municipalities have the responsibility to include this information in order to protect their community's historic and cultural heritage.

Chapter 6: Conclusion

Disaster planning in the United States begins at the state and local level. State, county, and city hazard mitigation plans help prepare communities for natural disaster events and protect their economic and cultural resources. In the past, historic preservation and disaster management were not well integrated. But within the last few decades, this has changed with FEMA offering resources such as Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning Guide to assist in integrating these two fields at the local level. Natural disaster events also led to disaster management policy and planning changes. Hurricane Katrina (2006) led to the creation of the NDRF which emphasizes planning at the local level as well as the importance of cultural and historic resources. Later, Hurricane Sandy (2012) led to the passage of environmental policies that focused on planning for the effects of climate change.

Enforcing his deregulatory agenda, President Trump is reversing Obama-era policies meant to curb pollution and prepare the United States for climate change. The Trump Administration's denial of human-induced climate change also affects disaster management. After a record 2017 hurricane season, FEMA acknowledged the inadequacy of their response, while also removing all mentions of climate change from their Strategic Plan. Planning for the effects of climate change is essential to protect communities as well as their historic resources. Trump's actions have thus endangered cultural heritage and historic resources by cutting funding for cultural programs and selling National Monument lands to fossil fuel industries. The Trump Administration's lack of planning for climate change and disregard of historic resources endanger intangible cultural practices as well as tangible historic resources.

States and local municipalities must integrate climate change planning as well as historic resources into their hazard mitigation plans. Out of the three state and local plans included in my assessment, only Annapolis is incorporating these aspects into their CRHMP. While I determined

that Annapolis is the best example of the three plans, “Weather it Together” is still not a fully comprehensive example of best practices because it did not plan for all resources present in the city and only included flood inundation in their hazard assessment.

While the basic disaster guidelines outlined in my assessment checklist such as hazard identification, risk assessment, and mitigation strategies are essential to a HMP for historic properties, they do not fully prepare historic properties for the effects of climate change. State and local municipalities must also evaluate their existing mitigation capabilities and, where necessary, coordinate with outside local, national, as well as international organizations to update their cultural heritage and climate change plans and legislation. Collaboration with multiple stakeholders is necessary to ensure the most up-to-date SLR and cultural heritage information is available for planning purposes. This collaboration is also critical to implementing the HMP and creating new Management Options and Adaptation Actions to prepare historic properties for climate change.

The best practices established by my Historic Resource Disaster Management Plan Checklist and assessment of existing HMPs emphasize the need for new planning and preparedness methods for historic resources. Climate change’s uncontrollable nature and impacts on cultural resources and heritage sites will require unique planning methods from the United States and the global heritage framework. Disaster planning for these resources will have to include new elements to account for the effects of climate change; management options and adaptation actions provide tools for long-term planning and the prioritization of resources. Standard elevation guidelines need to be created for historic buildings that protect them from sea-level rise but do not damage their historic integrity. Prioritization of cultural resources and guidelines for the documentation and loss of sites is also required as climate change effects increase.

Historic and cultural resources contribute to the quality of life and mental well-being of a community. They are also economic resources and their preservation and protection from natural hazards and the effects of climate change are good business practice. As natural disaster events increase in frequency and severity due to climate change, cultural resources' influence on the resilience of a community will also increase. Several Atlantic coastal states such as Delaware, Maryland, New York City, Virginia, and South Carolina have already developed climate change adaptation plans to address the vulnerability of their communities.⁵⁶³ With the changes occurring at the federal level, states and local municipalities need to utilize the best practices established by my assessment checklist to extend these planning methods and create comprehensive, climate change-driven disaster mitigation plans for historic properties. Under a presidential administration that does not show regard for climate change planning or historic resources, states and municipalities are the first line of defense to protect these resources. As Annapolis stated in their plan regarding public awareness and education, the objective is simple: “the necessity to act now”.⁵⁶⁴

⁵⁶³ NJ Climate Adaptation Alliance, “A Summary of Climate Change Impacts and Preparedness Opportunities for the Coastal Communities in New Jersey,” 6–7.

⁵⁶⁴ Bain et al., “Weather It Together: A Cultural Resource Hazard Mitigation Plan for the City of Annapolis,” 96.

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Appendix A: List of Acronyms

AA	Antiquities Act
ABFE	Advisory Base Flood Elevation
ACHP	Advisory Council for Historic Preservation
AIA	American Institute of Architects
ARPA	Archaeological Resources Protection Act
BFE	Base Flood Elevation
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CLG	Certified Local Government
CRCC	Cultural Resource Climate Change Strategy
CRGIS	Culture Resource Geographic Information Systems
CRHMP	Cultural Resources Hazard Mitigation Plan
DMA	Disaster Mitigation Act
DOI	Department of the Interior
EHP	Environmental and Historic Preservation
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FMSF	Florida Master Site File
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GPS	Global Positioning System
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
ICOMOS	International Council on Monuments and Sites

IPCC	Intergovernmental Panel on Climate Change
MAT	Mitigation Assessment Team
NASA	National Aeronautics and Space Administration
NDRF	National Disaster Recovery Framework
NEH	National Endowment for the Humanities
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGO	Non-governmental Organization
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRHP	National Register of Historic Places
NTHP	National Trust for Historic Preservation
NYCHA	New York City Housing Authority
PKEMRA	Post-Katrina Emergency Management Reform Act
SAT	Save America's Treasures
SHMP	State Hazard Mitigation Plan
SHPO	State Historic Preservation Office
SHPP	State Historic Preservation Plan
SLR	Sea Level Rise
SRIA	Sandy Recovery Improvement Act
THPO	Tribal Historic Preservation Office
UNESCO	United Nations Educational, Scientific and Cultural Organization
USACE	United States Army Corp of Engineers

Appendix B Assessment Checklist

HISTORIC RESOURCE DISASTER MANAGEMENT PLAN CHECKLIST	Y/N	Location in Plan
Name of State/Municipality		
Planning Process		
P1. Does the plan describe the planning process used to develop the plan? [44 CFR §§201.4(b) and (c)(1)] ⁵⁶⁵		
P2. Does the plan describe how the state coordinated with other agencies and stakeholders? [44 CFR §§201.4(b) and (c)(1)] ⁵⁶⁶		
P3. Does the plan describe developing systems for indicating and comparing cultural resource vulnerability to climate impacts? ⁵⁶⁷		
P4. Does the plan identify historic preservation and cultural resource experts present on the planning team? ⁵⁶⁸		
P5. Does the plan identify resources for hazard mitigation related to historic properties and cultural resources? ⁵⁶⁹		
P6. Does the plan include guidelines for cautions regarding public disclosure of sensitive cultural information? (i.e. locations of archaeological sites or details of certain cultural practices and traditions) ⁵⁷⁰		
P7. Does the plan include guidelines for adhering to regulatory review such as NHPA Section 106 review procedures? ⁵⁷¹		
Notes:		
Hazard Identification and Risk Assessment		

⁵⁶⁵ United States, “State Mitigation Plan Review Guide” 45.

⁵⁶⁶ United States, “State Mitigation Plan Review Guide”, 45.

⁵⁶⁷ National Park Service, “Cultural Resources Climate Change Strategy,” 10.

⁵⁶⁸ United States. Department of the Homeland Security. Federal Emergency Management Agency, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 1–1.

⁵⁶⁹ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 1–1.

⁵⁷⁰ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 4–1.

⁵⁷¹ United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 4–1.

H1. Does the risk assessment include an overview of the type and location of all natural hazards that can affect the state? [44 CFR §201.4(c)(2)(i)] ⁵⁷²		
H2. Does the risk assessment provide an overview of the probabilities of future hazard events? [44 CFR §201.4(c)(2)(i)] ⁵⁷³		
H3. Does the risk assessment address the vulnerability of state historic assets located in hazard areas and estimate the potential dollar losses to these assets? ⁵⁷⁴		
H4. Does the plan include a method of assessment to identify vulnerable historic resources? ⁵⁷⁵		
H5. Does the plan include an inventory of vulnerable cultural resources and historic properties? ⁵⁷⁶		
H6. Does the plan include methods for prioritization of vulnerable historic properties and cultural resources? ⁵⁷⁷		
H7. Does the plan describe a method for documenting a baseline for historic properties and/or cultural resources? (i.e. resource location, condition, significance, and national, regional or local contexts) ⁵⁷⁸		
H8. Does the plan include a method for assessing and monitoring the cultural resource condition “vital signs”? ⁵⁷⁹		
H9. Does the plan account for all types of historic and cultural resources? (i.e. historic structures, landscapes, archaeological sites) ⁵⁸⁰		
Notes:		
Mitigation Strategy and Priorities		

⁵⁷² United States, “State Mitigation Plan Review Guide,” 45.

⁵⁷³ United States, “State Mitigation Plan Review Guide,” 45.

⁵⁷⁴ United States, “State Mitigation Plan Review Guide,” 45; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–1.

⁵⁷⁵ National Park Service, “Cultural Resources Climate Change Strategy,” 32.

⁵⁷⁶ National Park Service, 32; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 1–1.

⁵⁷⁷ National Park Service, “Cultural Resources Climate Change Strategy,” 33; United States, “Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning,” 2–1.

⁵⁷⁸ National Park Service, “Cultural Resources Climate Change Strategy,” 33.

⁵⁷⁹ National Park Service, “Cultural Resources Climate Change Strategy,” 10.

⁵⁸⁰ National Park Service, “Cultural Resources Climate Change Strategy,” 28.

M1. Does the plan describe the mitigation planning process for historic properties and cultural resources? ⁵⁸¹		
M2. Does the mitigation strategy include goals to reduce / avoid long-term vulnerabilities from the identified hazards? [44 CFR §201.4(c)(3)(i)] ⁵⁸²		
M3. Does the plan prioritize mitigation actions to reduce vulnerabilities identified in the risk assessment? [44 CFR §§201.4(c)(3)(iii) and (iv)] ⁵⁸³		
M4. Does the plan identify current and potential sources of funding to implement mitigation actions and activities? [44 CFR §201.4(c)(3)(iv)] ⁵⁸⁴		
M5. Does the plan identify possible constraints and opportunities to mitigation actions and activities? ⁵⁸⁵		
M6. Was the plan updated to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities? [44 CFR §201.4(d)] ⁵⁸⁶		
M7. Does the plan include guidelines for training those involved in the care, maintenance, and interpretation of cultural resources? ⁵⁸⁷		
M8. Does the plan comply with the Secretary of Interior Standards for the Treatment of Historic Properties when recommending mitigation actions for historic properties and cultural resources? ⁵⁸⁸		
Notes:		
State Mitigation Capabilities		
M9. Does the plan discuss the evaluation of the state's hazard management policies, programs, capabilities, and funding sources to mitigate the hazards identified in the risk assessment? [44 CFR §201.4(c)(3)(ii)] ⁵⁸⁹		
M10. Does the plan develop guidance to relate state/local historic preservation legislation and programs to climate change mitigation? ⁵⁹⁰		

⁵⁸¹ United States, "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning," 3–1.

⁵⁸² United States, "State Mitigation Plan Review Guide," 45.

⁵⁸³ United States, "State Mitigation Plan Review Guide," 45.

⁵⁸⁴ United States, "State Mitigation Plan Review Guide," 45.

⁵⁸⁵ National Park Service, "Cultural Resources Climate Change Strategy," 35.

⁵⁸⁶ United States, "State Mitigation Plan Review Guide," 45.

⁵⁸⁷ National Park Service, "Cultural Resources Climate Change Strategy," 30.

⁵⁸⁸ National Park Service, "Cultural Resources Climate Change Strategy," 14.

⁵⁸⁹ United States, "State Mitigation Plan Review Guide," 45.

⁵⁹⁰ National Park Service, "Cultural Resources Climate Change Strategy," 12.

M11. Does the state demonstrate commitment to a comprehensive mitigation program? [44 CFR §201.5(b)(4)] ⁵⁹¹		
M12. Is the state effectively using existing mitigation programs to achieve mitigation goals? [44 CFR §201.5(b)(3)] ⁵⁹²		
Notes:		
Management Options		
Ma1. Does the plan consider alternative management options such as scenario planning? ⁵⁹³		
Ma2. Does the plan consider loss of historic resources in management goals? ⁵⁹⁴		
Ma3. Does the plan include a method of assessment for determining the potential loss of a resource? ⁵⁹⁵		
Ma4. Does the plan include a method of documentation of a potentially lost resource? ⁵⁹⁶		
Notes:		
Adaptation Actions and Options		
A1. Does the plan include adaptation options as management approaches? ⁵⁹⁷		
A2. Does the plan develop adaptation approaches for long-term climate change impacts and acute disasters? ⁵⁹⁸		
A3. Does the plan describe methods and provide guidance for any or all the following adaptation options for historic resources? ⁵⁹⁹		
1. No Active Intervention needed for resource		
2. Offset Stress of resource		
3. Improve resilience/resistance of resource		
4. Manage change of resource		
5. Relocate/facilitate movement of resource		

⁵⁹¹ United States, “State Mitigation Plan Review Guide,” 47.

⁵⁹² United States, “State Mitigation Plan Review Guide,” 47.

⁵⁹³ National Park Service, 34.

⁵⁹⁴ National Park Service, 34.

⁵⁹⁵ National Park Service, 34.

⁵⁹⁶ National Park Service, 37.

⁵⁹⁷ National Park Service, 35.

⁵⁹⁸ National Park Service, 12.

⁵⁹⁹ National Park Service, 36–37.

6. Document Resource and prepare for loss		
7. Interpret the change of resource due to climate change effects		
A4. Does the plan identify possible constraints and opportunities to adaptation actions and activities? (i.e. Funding, technological resources, time frame/urgency, consultation with public/tribal/other stakeholders) ⁶⁰⁰		
A5. Does the plan discuss coordination with funding partners to support further research in cultural resource climate change adaptation? ⁶⁰¹		
A6. Does the plan comply with the Secretary of Interior Standards for the Treatment of Historic Properties when recommending adaptation actions for historic properties and cultural resources? ⁶⁰²		
Notes:		
Plan Review, Evaluation, and Implementation		
I1. Is there a description of the method and schedule for keeping the plan current? [44 CFR §§201.4(c)(5)(i) and 201.4(d)] ⁶⁰³		
I2. Does the plan describe the systems for monitoring implementation and reviewing progress? [44 CFR §§201.4(c)(5)(ii) and 201.4(c)(5)(iii)] ⁶⁰⁴		
I3. Does the plan describe the systems for reviewing and updating inventory data? ⁶⁰⁵		
I4. Does the plan discuss guidelines for monitoring and reassessment of resource condition? ⁶⁰⁶		
I5. If the resource condition changes, does the plan describe the method and schedule to return to the planning stage? ⁶⁰⁷		
I6. Does the plan discuss guidelines for monitoring and reassessment of climate projections? ⁶⁰⁸		
I7. If the climate projections change, does the plan describe the method and schedule to return to the research stage? ⁶⁰⁹		
Notes:		

⁶⁰⁰ National Park Service, 35.

⁶⁰¹ National Park Service,, 11.

⁶⁰² National Park Service, 14.

⁶⁰³ United States, "State Mitigation Plan Review Guide," 46.

⁶⁰⁴ United States, "State Mitigation Plan Review Guide," 46.

⁶⁰⁵ United States, "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning," 4–1.

⁶⁰⁶ National Park Service, "Cultural Resources Climate Change Strategy," 38.

⁶⁰⁷ National Park Service, "Cultural Resources Climate Change Strategy," 38.

⁶⁰⁸ National Park Service, "Cultural Resources Climate Change Strategy," 38.

⁶⁰⁹ National Park Service, "Cultural Resources Climate Change Strategy," 38

Local Coordination and Mitigation Capabilities		
L1. Does the plan generally describe and analyze the effectiveness of local and tribal, as applicable, mitigation policies, programs, and capabilities? [44 CFR §201.4(c)(3)(ii)] ⁶¹⁰		
L2. Does the plan describe the process to support the development of approvable local and tribal, as applicable, mitigation plans? [44 CFR §§201.3(c)(5) and 201.4(c)(4)(i)] ⁶¹¹		
L3. Does the plan describe the criteria for prioritizing funding? [44 CFR §201.4(c)(4)(iii)] ⁶¹²		
L4. Does the plan describe the process and timeframe to review, coordinate and link local and tribal, as applicable, mitigation plans with the state mitigation plan? [44 CFR §§201.3(c)(6), 201.4(c)(2)(ii), 201.4(c)(3)(iii), and 201.4(c)(4)(ii)] ⁶¹³		
Notes:		
Integrated Planning		
C1. Does the plan effectively connect with other local, regional, national, and international organizations and stakeholders to obtain the most up-to-date climate and cultural heritage information? ⁶¹⁴		
Notes:		

⁶¹⁰ United States, “State Mitigation Plan Review Guide,” 46.

⁶¹¹ United States, “State Mitigation Plan Review Guide,” 46.

⁶¹² United States, “State Mitigation Plan Review Guide,” 46.

⁶¹³ United States, “State Mitigation Plan Review Guide,” 46.

⁶¹⁴ National Park Service, “Cultural Resources Climate Change Strategy,” 40.