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Recovery from Minor Tropical Cyclones: the Response of Faith-based Organizations and Government Agencies to Minor Tropical Cyclones in Biloxi, Mississippi

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RECOVERY FROM MINOR TROPICAL CYCLONES: THE RESPONSE OF FAITH-
BASED ORGANIZATIONS AND GOVERNMENT AGENCIES TO MINOR
TROPICAL CYCLONES IN BILOXI, MISSISSIPPI

by

Camilla Carrabella Witherspoon

A Thesis
Submitted to the Graduate School,
the College of Arts and Sciences
and the School of Ocean Science and Engineering
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Science

Approved by:

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ABSTRACT

The impacts of major hurricanes are extensively researched in Disaster Resilience literature and the field of Human Geography; in contrast, the aftermath of minor tropical cyclones is understudied. Along the Gulf Coast in 2020 and 2021, more minor tropical cyclones made landfall than major hurricanes (NOAA, 2021). Despite the frequency of minor tropical cyclones, few studies have considered the resources and actors involved in recovery from minor tropical cyclones.

This thesis uses qualitative methods, including semi-structured interviews and document collection, to examine how Faith-based Organization (FBO) and government agency leaders in Biloxi, Mississippi provide resources to residents, interact with each other, and engage with vulnerable communities in the wake of minor tropical cyclones. Findings show the limitations of governmental agency funding and resources following minor tropical cyclones, revealing why recovery efforts are often dependent on FBOs. Results also demonstrate that many FBO and government agency leaders have found vulnerabilities to and recovery from minor tropical cyclones to be multidimensional. For these local actors, the term *minor* underrepresents the destruction and harm caused by minor tropical cyclones.

Given ongoing hardships from hurricane impacts along the Gulf Coast, this case study offers insights into the key roles that FBOs and government agencies play in recovery from minor tropical cyclones. The findings suggest opportunities for the development of future research on minor disasters, both within coastal Mississippi and beyond.

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CHAPTER I - INTRODUCTION

1.1 Overview of Literature

The United States Gulf of Mexico Coast (hereafter Gulf Coast) has a long history of hurricanes and other natural disasters. In Mississippi, these disasters have led to recurring national recovery support that has failed to address the full extent of disaster damages. Before the well know disasters of Hurricane Katrina and the BP oil spill, Hurricane Camille devastated the Mississippi Gulf Coast in 1969 (NOAA, 2021). In the intervening years between Hurricane Camille and Hurricane Katrina, less significant hurricanes impacted Mississippi, including Hurricane Andrew 1992 and Hurricane Ivan 2004 (NOAA, 2021). Specifically, Hurricane Katrina in 2005 and the BP Oil Spill in 2010 caused lasting economic, environmental, and public health damages (Shao et al., 2020; Cutter et al., 2014).

The literature examining natural disasters and hazards in Mississippi and along the Gulf Coast focuses distinctly on impacts of the aftermath and recovery from catastrophic natural disasters and major hurricanes. The distinction between major hurricanes and minor tropical cyclones is that minor tropical cyclones include storm classifications up to Category 2 hurricanes, which peak with wind speeds of 110 mph based on the Saffir-Simpson scale (Taylor et al., 2010). Aid work after major hurricanes and natural disasters is predominantly funded and resourced at a federal level, and recovery efforts have received national attention.

Even with national funding and resources, natural disasters, such as hurricanes, have contributed to the destabilization of socially vulnerable individuals along the Gulf Coast (Shao et al., 2020; Bjarnadottir et al., 2011). For example, recent research from

2020 considers how hurricanes have harmed vulnerable people (Shao et al., 2020). The literature suggests that multiple factors contribute to vulnerability, including poverty (Gault et al., 2005; Curtis et al., 2007), physical exposure risk (Valk, 2020, Shao et al., 2020), and individual positionality (Muñiz, 2006; Gault et al., 2005; Morse, 2008). The combined impact of these factors on major hurricane recovery is further examined through vulnerability indices (Bohle, 1994; Cutter, 2008; Schlegelmilch, 2020). However, while these indices focus on vulnerability preceding catastrophic natural disasters and major hurricanes, the use of index leads to an insufficient job of addressing vulnerability. After Hurricane Katrina, Biloxi, Mississippi residents received insufficient federal aid as New Orleans was deemed a more urgent emergency (Hayden, 2010; Anthony & Sellnow, 2010; Cutter et al., 2014; Lowe, 2012).

Presently, the literature does not sufficiently consider the toll of minor tropical cyclones on vulnerable communities, despite recent tropical cyclone activity. Biloxi's residents were impacted by tropical cyclone level damage in 2021 by tropical cyclone Claudette and peripheral impacts of Hurricane Ida (NOAA, 2021). Previously, in 2020, five tropical cyclones made landfall in Biloxi, one with category 3 force winds and the rest with minor tropical cyclone force (NOAA, 2021). This research will address this gap by examining the recent minor tropical cyclone recovery in Biloxi. Further, the literature calls for research into the role of and the ways in which small community recovery agencies and organizations interact with one another when aiding recovery (Griego et al. 2020; Andrew et al. 2020). The present study responds to this call by considering how local government agencies and faith-based organizations (FBOs) interact to support vulnerable individuals recovering from the impacts of minor tropical cyclones.

1.2 Research Questions

This thesis investigates the following overarching research question and the subsequent three key questions. The overarching research question is: How do Biloxi's FBOs and government agencies provide resources and engage with vulnerable communities in the wake of minor tropical cyclones, and how do these responses differ from and/or relate to one another? Specifically, this master's thesis examines three key research questions:

(Q1) How do FBOs and government agencies in Biloxi provide resources to vulnerable communities after minor tropical cyclones?

(Q2) How do FBOs and government agencies in Biloxi engage with vulnerable communities after minor tropical cyclones?

(Q3) How do FBOs and government agencies in Biloxi that provide resources to and/or engage with vulnerable communities interact with each other in the wake of minor tropical cyclones?

I employed qualitative research methods in a case study of Biloxi to address these questions. Data consisted largely of interviews with and document collection from government agency and FBO leaders about their experiences in the wake of minor tropical cyclones. Chapter II specifically addresses Q1 and Q3, above. The research process revealed that the funding offered after a major hurricane versus that offered after a minor tropical cyclone impacted the resources provided by and interactions between these government agencies and FBOs. Chapter 3 addresses Q2. Understandings and definitions of recovery were a key component of government agency and FBO leaders' responses to Q2, which asked about engagement with vulnerable communities.

1.3 Theoretical Approach

This section on the theoretical approach for this case study conceptualizes each of the three research questions within natural disaster literature on the Gulf Coast. This theoretical approach provides a brief overarching guide for why these questions should be considered and how the discipline enriches that consideration. For each research question, I present the key literature related to the government agency and FBO aid following previous hurricanes on the Gulf Coast. I examine how the literature presents the context for the study and describe how this research fits into current scholarly discussions.

1. How do Biloxi's FBOs and government agencies provide resources to vulnerable communities after minor tropical cyclones?

This question is key in addressing not only what government agencies and FBOs used for providing resources after minor tropical cyclones, but also, how, and why they were chosen to provide those resources. Scholars have stressed the need to develop more coordinated and systematic approaches for “proactive” hurricane relief (Green et al., 2006; Green et al., 2007; Cain & Barthelemy, 2015). Past research has examined the resources provided by local FBOs and government agencies after Hurricane Katrina along the Gulf Coast (Green et al., 2006; Green et al., 2007; Cain & Barthelemy, 2008); however, studies have lacked in-depth investigations on need anticipation and the distribution of resources following minor tropical cyclones (Green et al., 2006).

Deficient standardization between local FBOs and government agencies can hide what resources each provides as part of their relief effort and who receives those resources (De Vita and Kramer, 2008). Despite strategies to improve resource

distribution, many of Hurricane Katrina's resource issues subsequently occurred in the wake of Hurricanes Harvey (Fitzpatrick et al., 2020) and Michael (Pathak et al., 2020). A specific example of a repeated issue from after Hurricane Katrina is food insecurity, after Hurricane Harvey: Fitzpatrick and others (2020) highlighted how food distribution systems could benefit from including the voice of vulnerable community members in decision-making to improve the distribution of food and other essential items. Knowledge gaps in local resource practices create ambiguity about which vulnerable communities receive resources and what resources are provided in the wake of tropical cyclones.

Gaps in resources and resource distribution harm vulnerable people who are already disproportionately impacted by hurricanes, as seen after Hurricane Katrina (Eliot and Pais, 2006). In their 2020 study, Spielman and others used Social Vulnerability Indicators to define vulnerable people as anyone living with compounding social vulnerabilities (economic, social, cultural, political, and institutional) that impede their recovery from hazards (Spielman et. al, 2020). Hurricane Katrina demonstrated how different people's recovery from the disaster varied drastically based on the social vulnerability factors of race and socio-economic standing (Shao et al., 2020). For example, in 2008 African Americans were twice as likely to be assigned and to have an extended stay trailers as interim housing than white people displaced by Hurricane Katrina (Graif, 2016). Current environmental justice literature highlights the responses to Hurricanes Katrina and Harvey as cases where social injustice was exacerbated by hurricanes (Flores, et. al 2020; Fitzpatrick et al., 2020). Vulnerability extends further than what immediate relief resources are given after tropical cyclones, vulnerability and those

who are vulnerable must be considered in a larger way, as explained by the following quote:

“Vulnerability must be addressed in planning for disaster preparedness, relief, recovery, and redevelopment. Geographic areas and socioeconomic groups that may be particularly susceptible to the negative impacts of a disaster should be afforded direct attention rather than being treated as an afterthought. Consideration of people’s livelihoods is critical, and both their housing and health needs demand attention beyond water, food, clothing, and emergency shelter” (Green et al., 2006, pg. 97)

Thus, it is important to understand and consider resources without conflating them as a full solution or countermeasure to vulnerability.

FBOs and government agencies provide different resources. The definition of resource, as used in this research, exceeds just physical items, and includes more abstract services like counseling and childcare. FBOs on the Gulf Coast, specifically in Mississippi and Louisiana, provided basic physical resources and services that were aimed more at temporary relief after Hurricane Katrina (De Vita and Kramer, 2008). For example, immediately after Hurricane Katrina, FBOs outside of the impacted areas provided food, clothing, temporary shelter, mental health services, and financial support (Cain and Barthelemy, 2007; De Vita and Kramer, 2008). In New Orleans, FBOs were met with significant community trust, and 88% of FBOs providing care offered counseling services after Hurricane Katrina to help people deal with the trauma (Cain and Barthelemy, 2007). FBOs have been shown in some instances to be better positioned than government agencies to respond quickly to needs and predict needs based on their close connection to communities (Cain, 2015; Gheytauchi et al., 2007).

Conversely, as a result of the slow national responses to Hurricane Katrina, many people in New Orleans distrusted government assistance both from federal and state agencies (Cannon et al., 2020; Malhotra and Kuo, 2008). However, government agencies had the resources to focus on long-term aid such as housing redevelopment for low-income housing and city revitalization (Lowe, 2012). It is unclear what resource gap vulnerable people may experience within the timeline of their recovery. How FBOs and government agencies plan for and distribute resources in the wake of hurricanes can illuminate effective strategies for recovery.

FBOs and government agencies matter because they provide essential resources to vulnerable communities during the critical time of tropical cyclone recovery (Marasco et al., 2020). Green and others (2006) stated that the needs of vulnerable people should be anticipated instead of handled as an afterthought. Additionally, there is sparse disaster recovery literature in the Gulf Coast that addresses: (1) *who* receives resources from local government agencies and FBOs; (2) *how* local government agencies and FBOs choose the resources they provide; and (3) *when* in the aftermath of a hurricane government agencies and FBOs provide resources. This thesis explores the intricacies of how FBOs and government agencies make aid-related decisions and how both seek to provide appropriate resources. Furthermore, I scrutinize how vulnerable communities are defined and considered. My research addresses the interaction between local government agencies and FBOs and how that interaction influences resource overlap and gaps in providing aid. Finally, the thesis considers how resource allocation decisions are made and the implications of those decisions.

2. How do local FBOs and government agencies engage with vulnerable communities after minor tropical cyclones?

The different historical strategies FBOs and government agencies have undertaken with respect to community engagement show different approaches to the same concern: supporting vulnerable communities (Lowe, 2012). FBOs and government agencies are positioned to offer different recourses (Cain and Barthelemy, 2015). Hurricane Katrina revealed a difference between how FBOs and government agencies approach local communities. As addressed in Q1, FBOs have close connections to the community (Cain and Barthelemy, 2015; Gheyntanhi et al., 2007), and vulnerable community members may distrust the government (Cannon et al., 2020; Malhotra and Kuo, 2008), thereby leading some vulnerable people to turn to FBOs after Hurricane Katrina. Organizational engagement with the local community has shaped more than just the resources the organizations provide; instead, these approaches influence community trust and how sustainably they are able to aid vulnerable individuals.

Mental health services, a significant kind of engagement, have been predominantly offered by FBOs. Providing access to this resource affects both the connection and the role that FBOs have in their local community. Following Hurricane Katrina, the connection FBOs had to their congregations made them uniquely positioned to support people with mental health concerns (Curtis et al., 2007; Leavell et al., 2012). In New Orleans, 70% of pastors were trained to work with people who had experienced trauma related to Katrina (Cain and Barthelemy, 2015). But hurricanes put immense pressure on the New Orleans clergy who coped with the aftermath of Hurricane Katrina in a multitude of ways (e.g., through laughter, community support, burnout, or

alcoholism) (Leavell et al., 2012). Faith counselors need better resources and support to be able to effectively take care of their congregation (Rowel, 2011). Outside of New Orleans, FBOs in Louisiana and Mississippi have expressed a desire to better train their faith counselors for work with post-disaster trauma community members (Cain and Barthelemy, 2015; De Vita and Kramer, 2008; Cain and Barthelemy, 2007). Mental health services have been central to how FBOs support their communities in the wake of hurricanes. However, it is unclear if there are vulnerable people outside of FBO congregations that need but do not receive counseling. Access to mental health services should be considered when examining FBO community engagement.

Government aid in the Gulf Coast is more sustainable than that provided by FBOs, but generally, insufficient connections with the local community limit its reach (Cain and Barthelemy, 2007). After Hurricane Katrina, one of the largest concerns of community members in Biloxi was the misallocation of funds by local officials and a lack of prioritization of vulnerable people (Lauria, 2015; Lowe, 2012). For example, in Biloxi, government officials prioritized rebuilding casinos over low-income housing (Tierney, 2007; Cutter, 2006). However, government agencies have been able to provide more sustained and, in some ways, larger forms of aid than FBOs, for example direct financial aid to residence through FEMA (Sobel and Leeson, 2006). How government agencies and officials engage with the community matters because it can determine whether people will seek out their resources and support during hurricane recovery.

FBOs and government agencies engage with vulnerable communities differently. This can influence the level of trust endeared to each and their knowledge of community needs. The examples of FBOs providing mental health counseling and government

agencies reconstructing housing demonstrate different forms of engagement and reinforce the idea that these agencies and organizations operate on different time frames (FBOs predominately offer short-term care and government agencies work on long-term revitalization). This Thesis analyzes the dynamics between the agencies and organizations offered to vulnerable communities within Biloxi. This thesis examines how the leaders of FBOs, and government agencies consider their engagement with vulnerable communities.

3. Do FBOs and government agencies collaborate with each other in the wake of minor tropical cyclones (and if so, how)?

Current natural disaster research emphasizes collaborations between FBOs and government agencies. When COVID-19 coincided with an active hurricane season, experts considered how local organizations should tackle simultaneous disasters and risk in 2020: should the safety concerns of COVID-19 or hurricane damage take precedence (Phillips et al, 2020; Shultz 2020)? Collaboration or wanted collaboration between FBOs and government agencies consists of at least one of the following: groups sharing resource dispersal responsibilities (Green et al., 2006), FBOs helping to guide government policy (Rowel, 2011; Stuart, 2010), and government agencies financially supporting FBOs (De Vita and Kramer, 2008). The combination of these three forms of collaboration (resource sharing, policy guidance, and financial support) allow for the optimal assistance of FBOs by the government and government by FBOs, thereby enabling both to better serve their communities.

Resource coordination and incorporation of FBOs and community members in policy decisions are two of the ways for FBOs and government agencies to collaborate. A lack of communication about what resources are provided by FBOs or government agencies, and whom they are distributed to can make resource distribution redundant or insufficient (Green et al., 2006). Improving communication between agencies and organizations could allow resource distribution to serve vulnerable communities more effectively (Green et al., 2006; Green et al., 2007). The government could also improve its resource provision for the community by listening to community members (Green et al., 2006) or collaborating with churches as they plan natural disaster recovery plans for the local community (Rowel, 2011; Stuart, 2010). However, these ideas primarily come from authors who only research the perspectives of FBO participants and advocate the benefits of FBOs without considering the constraints and potential shortfalls of how FBOs provide resources after tropical cyclones.

The government's financial support of FBOs after hurricanes is contested. Hurricane relief was not sustainable for many FBOs in the wake of Hurricane Katrina, as the financial status of many FBOs was undermined throughout the process of recovery. Only one-third of FBOs in Mississippi and Louisiana had experience with disaster relief before Hurricane Katrina so most FBOs improvised (De Vita and Kramer, 2008). Providing for communities is expensive, and 37% of FBOs in New Orleans used part of their general budget to cover the increased need from the community (Cain and Barthelemy, 2007; Cain and Barthelemy, 2015). But even with the proximity of FBOs to the communities in need, government funding has traditionally favored secular organizations. After Hurricane Katrina, secular organizations were three to four times

more likely to receive financial support from the government (De Vita and Kramer, 2008). In the aftermath, one-fifth of FBOs received federal grant funding to help with structural damage and less than five percent received state funding from Louisiana (Cain and Barthelemy, 2015). In all, FBO interviewees from several of the reviewed articles (Cain and Barthelemy, 2007; De Vita and Kramer, 2008; Cain and Barthelemy, 2015) expressed wanting more support and celebration from the government. Moreover, experts suggest increased support for FBOs, expanded collaboration with FBOs, and additional funding for FBOs (Green et al., 2006; Cain and Barthelemy, 2015).

The current theoretical framework examines how FBOs, and government agencies interact in the wake of minor tropical cyclones; perceptions about kind of resources the other provides in addition to how effective they believe there interactions are in furthering recovery. These perspectives have informed the overall network of Biloxi's localized aid. Collaborations can influence which resources each government agency or FBO provides and how they engage with vulnerable individuals. By communicating or sharing funds, government agencies and FBOs can work to optimize resource distribution to vulnerable communities. Furthermore, an FBO that is more knowledgeable about the needs of vulnerable people can help guide government agencies. That said, not all forms of "collaboration" are positive; there might be competition between organizations that could make them less effective at providing aid (Andrew et al., 2020). Therefore, it is essential to understand the collaborations that exist between government agencies and FBOs, and the impacts they have on those who can support vulnerable people. Therefore, this thesis uses the term *interaction* to describe the dynamic between FBOs and government agencies.

1.4 Case Background and Methodology Approach

1.4.1 Case Background

Biloxi was chosen for this study on minor tropical cyclone recovery, in part, because Biloxi has a relatively high vulnerability that is starkly divided between Biloxi as a whole and the south-east end of town, locally known as East Biloxi. Within Biloxi, an historic economic disparity also exists between Biloxi and East Biloxi. This inequality has been a contributing factor in the relatively higher vulnerability of East Biloxi compared to the rest of the city. Historically, residents of East Biloxi have experienced the lowest income in Biloxi even though in the Antebellum period, East Biloxi was a racially diverse area and a hub for fishing, shipping, and manufacturing (Lowe, 2012). Into the 1970s, the area remained commercial as Vietnamese people settled there and became incorporated in the fisheries industry (Lowe, 2012). By 1992, gaming had become the main business for Biloxi with the development of 11 casinos (Lowe, 2012). This refocuses of industry sent fishing and the other commercial of East Biloxi into decline (Lowe, 2012). A recent report from Wilson and others (2018) suggested that residents in East Biloxi still have the lowest median income in Biloxi (Wilson, 2018).

Hurricane Katrina provides an essential reference point in contextualizing this case study. In 2005, Hurricane Katrina did catastrophic damage to 80% of homes in East Biloxi (Morse 2008). Yet, local governmental officials prioritized rebuilding casinos over low-income housing after Hurricane Katrina (Tierney, 2007; Cutter, 2006). Lowe (2012) termed Mississippi a “neoliberal” political culture where officials prioritize economic development over racial justice and social equity (Lowe, 2012).

Mississippi's local government officials also reallocated almost 600 million dollars away from affordable housing following Hurricane Katrina (Mores, 2008). A group of FBOs filed a lawsuit intending to return those funds to benefit low-income residents (Mores, 2008) and the settlement led to the disbursement of 32 million dollars for low-income housing along the Gulf Coast (Lowe, 2012). While this settlement was in progress, some FBOs took the lead in helping East Biloxi recover from Hurricane Katrina by rebuilding homes (Lowe, 2012; Morse, 2008). Through this and other initiatives, FBOs began to address needs in East Biloxi faster than government agencies (Lowe, 2012).

Hurricane relief literature has recognized various aspects of one's identity that may compound an individual's vulnerability to tropical cyclone impacts in Biloxi: This includes women (Gault et al., 2005), disabled individuals (Powell and Gilbert 2006), criminal offenders (Price, 2020), the elderly (Symonette, 2018), Latinx (Messias and Lacy, 2007; Muñiz, 2006), Vietnamese (Bankston, 2020; Mayfield-Johnson et al., 2020; Truitt, 2021), and African American (Morse, 2008; Cutter et al., 2006; Gabe et al., 2005) populations. East Biloxi remains multi-ethnic with small but vital communities of Vietnamese, Latinx immigrants, and African American residents. According to the demographic statistics from 2018 that compare Biloxi and East Biloxi: Biloxi is about 60% white, 21% African American, 7% Latinx, and 5% Asian. East Biloxi, on the other hand, has a population that is 43% white, 36% African American, 7% Latinx, and 10% Asian (Race and ethnicity, 2018). Thus, East Biloxi has a larger proportion of African American and Asian residents than other parts of Biloxi.

1.4.2 Moral Geographies in Mississippi after Hurricane Katrina

Pulling from Human Geography, this thesis considers the subjective perspectives of FBO and government agency leaders on the aid they offer. It also considers their perceptions of recovery in terms of subjective and qualitative metrics after minor tropical cyclones. Human Geography, as presented by Hayden (2010), considers the tension between what it takes for vulnerable people to recover and the government projection of everyone being equally devastated and recovering together.

Mississippians' response following Hurricane Katrina is indicative of a broadly shared identity in the region. Mississippians felt that it was their responsibility to recover and put themselves back together after a hurricane: "Mississippians represent themselves as fitting the model of the "worthy American" who "pulls himself up by his bootstraps." (Hayden 2010, p 189). In Hayden's quote, the idea of pulling yourself up by your bootstraps evokes a sense of rugged individualism, a concept that has been pervasive in American thought since the 18th century (Hayden, 2010). Hayden uses Moral Geographies to express how people's perceptions of their identities are impacted by this cultural narrative, regardless of whether all parts of that narrative are factual and accurate. This demonstrates an impactful tension between a community-oriented sense of equal devastation by Hurricane Katrina and the reality that some people were more vulnerable to Katrina because they had disproportionately fewer resources to recover (Hayden 2010). The tension between rugged individualism and the recognition that not everyone had the resources to pull themselves up by their "bootstraps" is ongoing since Hurricane Katrina provides framing for how the interviewed government agency and FBO leaders approached vulnerability and recovery.

1.4.3 Methodological Approach

This thesis employs a qualitative case study approach. Case studies provide an in-depth analysis of a bounded case, which allows the researcher to explore the complexity which enriches the case (Merriam and Tisdell, 2015). In contrast, a broad, more surface-level analysis could have missed components of FBOs and government agencies leaders' perspectives in Biloxi. This thesis applies inductive and deductive reasoning as part of this research approach (Merriam and Tisdell, 2015; Bernard et al., 2016). The deductive themes come from the literature and inductive themes are emergent from the findings (Bernard et al., 2016). The deductive themes in the research questions are interaction, resources, vulnerability. The included inductive themes relevant to findings were financing for resources and perceptions of recovery. One emergent theme, Hurricane Katrina, was only used as a comparison or reference in a few places but is not extensively written about because Hurricane Katrina is not a recent minor tropical cyclone. Additionally, this case study is bounded by a focus on the FBOs and government agencies who provide aid in Biloxi as the primary research subjects. Notably, while most of these organizations are in Biloxi, a couple of them are on the periphery of the city.

This research provides insight into how government agencies and FBOs think about and implement aid for vulnerable communities after minor tropical cyclones. I provide a brief discussion of general data collection and analytical methods used in this project here with specific methods within each chapter. The key theme of funding for minor tropical cyclones recovery emerged inductively, through this research, and informed findings in other themes, especially resources.

In this case study, semi-structured interviews were used to create space for an in-depth understanding of FBOs and government agency leaders' perspectives on the impacts of minor tropical cyclones and how they address those impacts. This research included the aid work of only government agencies and FBOs specifically because they are the predominant organizations that provide post-hurricane aid in Biloxi, and they have widely contrasted approaches to tropical cyclone recovery. Throughout this thesis FBOs and government agencies will at times be referred to as organizations and agencies.

Examples of government agencies include those at the state level in Mississippi, (e.g., the Mississippi Emergency Management Agency) and those at the local level. Local level agencies include those that are concerned with public safety (e.g., the Biloxi Fire Department, the Biloxi Police Department, and Harrison County Emergency Management), those that are concerned with government infrastructure (e.g., the Community Development Department and the Department of Engineering, City of Biloxi), and finally, other government agencies, including Sea Grant, and Public Housing. Large FBOs include, but are not limited to: the Red Cross, St. Vincent De Paul, Catholic Charities, United Way, a board of interfaith organizations, and others. Small FBOs with congregations span many faith denominations and are not listed here to ensure their anonymity.

Semi-structured interviews were conducted in June-August 2021 with 22 Faith-based leaders from 20 FBOs and 13 government leaders from 8 government agencies in Biloxi. All participants either oversaw or were part of the leadership teams at these FBOs and government agencies; therefore, all participants are interchangeably called leaders in this thesis. During interviews, I collected online publicly available documents, hard copy

referral lists and internal policy documents. Additionally, I recorded interviews and kept handwritten notes from each interview interaction.

I used an iterative data collection and analysis method to analyze my interviews while still conducting more interviews. During fieldwork, I reviewed and compared my notes and observations with interviews that I transcribed. Interview transcriptions were uploaded to QSR NVivo, and I used this qualitative analysis software to conduct inductive and deductive coding techniques. I thematically coded the semi-structured interviews by using my 3 research questions; I coded into themes pertaining to resources, interactions, and vulnerability. I then added the emergent codes of funding and recovery.

I provide complete research results and conclusions within the following two chapters. Chapter 2 presents the considerations of government agencies and FBOs when providing resources for vulnerable communities. This chapter addresses ways in which these government agencies and FBOs are funded and interact with one another, and how this contributes to the success or failure of resource distribution following minor tropical cyclones. Chapter 3 includes a definition of vulnerability and examines how understandings of recovery contribute to the complexity of recovery from minor tropical cyclones. Chapter 4 offers broad conclusions and avenues for future research.

CHAPTER II - FUNDING, RESOURCES, AND INTER-ORGANIZATIONAL INTERACTION AFTER MINOR TROPICAL CYCLONES

2.1 Introduction of Literature

On September 15, 2020, Hurricane Sally made landfall near Gulf Shores, Alabama as a Cat 2, later impacting Biloxi as a minor tropical cyclone hurricane with wind gusts of 44 mph (Berg and Reinhart, 2021). Near the coast, in the greater Biloxi area, over 60 roads flooded, and dozens of trees were downed (Berg and Reinhart, 2021). Tropical cyclone specialists were concerned about Hurricane Sally's rapid intensification before landfall as a risk to human life and infrastructure prior to the hurricane's actual landfall in Mississippi (Dzwonkowski et al., 2021). Although categorized as only a minor tropical cyclone, Hurricane Sally provides an example of how even relatively weaker storms can create disruptive amounts of damage.

Despite the substantial damage caused by Hurricane Sally, primary recovery efforts were managed by local government agencies and FBOs leaders, with limited federal financial assistance. These efforts are facilitated by several kinds of government leaders and faith-based organizers. Government agencies are organized across geographic distribution and contribute resources for recovery from the federal, state, regional, county, city, and town levels (Brown et al., 2020). In contrast, there are only two types of FBOs: one based around congregants and others based around social services (McGinnis, 2011). Local organizations and agencies are more involved in minor tropical cyclone recovery than their state and federal government counterparts. This paper uses a qualitative approach to scrutinize the role of local and regional government agencies and FBOs in resource decision-making and the importance of inter-organizational interaction.

Literature from human geography concerning hurricane recovery governance has primarily centered around recovery from the catastrophic impacts of major hurricanes and small-scale environmental disasters (e.g., Morse 2008; Lowe 2012; 2020; Shao et al., 2020). Andrew and others (2020) express the need for more research into the role of small community organizations in disaster resilience. Additionally, Griego and others (2020) call for further research into how inter-organizational practices can help develop efficient and substantial tropical cyclone recovery.

2.1.1 Government Agencies' and FBOs' Funding for Tropical Cyclone Recovery

There is a discrepancy between recovery funding after minor tropical cyclones and major hurricanes on the Gulf Coast. The Federal Emergency Management Agency (FEMA) covers 75-100% of the initial damage from major hurricanes. In contrast, minor tropical cyclone recovery is often funded through a state's rainy-day fund and totals less than half the funds put into recovery from a major hurricane (Jerch et al., 2020). FEMA spends significantly more on major hurricanes than on minor tropical cyclones; for example, in Mississippi, FEMA spent \$6,510,637 on Hurricane Ida (2021) and only \$18,450 on Hurricane Marco (2020) and Tropical Storm Laura (2020) (FEMA, 2021). Moreover, FEMA assistance is only available after tropical cyclones have been declared a state of emergency (FEMA, 2021). Further, the allocation of FEMA's funding can be delayed. For instance, Hurricane Zeta impacted Mississippi and Louisiana October 28, 2020. FEMA first response authorized on October 30th offered limited resources (tarps, meals, and liters of water) to residence of Mississippi (FEMA, 2021). According to FEMA, further assistance was delayed until after Zeta was reclassified (a category 3 hurricane instead of a category 2 hurricane) and as of March 4th has gone out to 4,100

individuals and households recovering from Hurricane Zeta (FEMA, 2021). Therefore, the initial recovery response for most minor tropical cyclones relies on state and local agencies or organizations on the Gulf Coast.

The current literature on disaster recovery introduces FBO funding in conjunction with government funding. According to Williams and Jacobs (2020), there is a growing need for additional support after disasters go unmet by professional disaster responders like the federal government. Disaster recovery, unadjusted for need, is a detriment to not only the residents but also the nonprofessional recovery organizations, like FBOs, who are working to help people recover (Williams and Jacobs, 2020). In other words, organizations that are not professionally structured to provide aid work can be harmed by a rapid increase in need. This gap is then exacerbated by underfunding (Williams and Jacobs, 2020). Many FBOs and nonprofits did not have the funding to be as adaptable to the dual challenges of COVID-19 and an active 2020 hurricane season as they had hoped (Hutton et al., 2021). A component of that challenge was expanding community needs while missing funding opportunities like fundraisers (Hutton et al., 2021). Disaster recovery scholars argue that funding is an issue and call for more funding for small community-level non-governmental organizations (Shlemegelmich et al., 2020; Bergstrand and Mayer 2020; Lowe, 2012).

2.1.2 Resources Provided by FBOs and Government Agencies after Tropical Cyclones

Disaster recovery literature in the Gulf Coast uses *Resources* and *Services* as umbrella terms to cover wide-ranging aid from many organizations. Many scholars have discussed the value of resources received following hurricanes, though what resources

they include is not always clearly defined (Shinn and Caretta, 2020; Dunning, 2020; Brown et al., 2020). Although others have distinguished between services and resources, for example, Dunning (2020), refers to volunteers' help as a service, which is different from physical aid resources. In contrast, Green and others (2006) categorized resources contributed by government agencies and FBOs following Hurricane Katrina as more than just material goods: they also presented physical, social, and financial resources. Studies have described the value of social resources, which expand understanding of aid beyond typical services. For example, after Hurricane Harvey some scholars defined helping with home repairs and assisting people with locating safe interim housing as social resources (Fitzpatrick et al. 2020; Clay and Ross 2020). Financial resources were considered separately by Green and others (2006), and later, Clay and Ross (2020) grouped them by organizational funding and FEMA funding disbursed directly to individuals. This chapter will use the second form of categorization based on kinds of resources because it is more specific.

Current literature also addresses how people receive resources, considers the inequity of resource distribution, the role of local stakeholders, and resource allocation improvements. Several studies examine how resource allocation after Hurricane Harvey could have been improved (Fitzpatrick 2020; Clay and Ross 2020; Flores 2020). For instance, Flores and others (2020) found that resources were inequitably distributed after Hurricane Harvey, citing uneven allocation and burdensome delays. Likewise, Brown and others, (2020) assert that future planning, policies, and resource allocation need to reflect local stakeholders' views.

How resources are distributed by FBOs can be impacted by a resource recipient's relation to that FBO. FBO leaders' decisions about how to help residents are often guided by their faith when running their organizations (McGinnis, 2011). FBOs support people beyond standard outreach after a disaster; however, current findings show residents are not treated equally by community organizations, like FBOs (Lui, 2020). As Lui (2020) explains, FBOs prioritize their congregants and the people connected to their organizations over other community members.

2.1.3 FBOs and Government Agencies interaction impacts on Tropical Cyclone recovery

Interactions between government agencies can impact the effectiveness of resource and service distribution to local areas, like Biloxi, and moreover influence recovery from tropical cyclones and ongoing aid. Geographical literature frames communication and coordination as primary methods of interaction between FBOs and government agencies.

Interorganizational communication is impacted by social connections and power dynamics between organizational leaders. Andrew and others (2020) stated that social connection is essential to offering quality aid and that some national government agencies and aid organizations lack both the crucial contextual knowledge and the personal connections that local organizations and agencies have fostered over time. For example, after Hurricane Katrina, government emergency managers were the gatekeepers of governmental funding in Biloxi, Mississippi (Wilson, 2018). Wilson (2018) describes how local non-governmental organizations had to negotiate with those emergency managers to get funds for their recovery efforts.

Lack of communication can also be a detriment to effective quantity estimation and allocation of resources. Green and others (2007) explained how limited communication between organizations providing resources can cause insufficiencies and shortages in those resources. Flores and others (2020) also linked resource shortages to inequitable distribution. After Hurricane Harvey, government agencies lacked sufficient communication with non-governmental organizations already providing targeted aid to vulnerable communities.

Hurricane recovery literature highlights how critical coordination is and suggests several ways to improve coordination through better communication and understanding of the roles of other organizations. One study found that inter-organizational coordination had distinct benefits following Hurricane Katrina (De Vita and Kramer, 2008). These benefits included the provision of rebuilding assistance, financial help, increased professional expertise, and the sharing of facilities and other resources (De Vita and Kramer, 2008). One way to improve coordination is to communicate with other organizations before hurricanes and other disasters (Green et al., 2006; Andrew et al., 2020). At all levels, from national to local, government agencies need to understand the availability and capacities of FBOs and community organizations (De Vita & Kramer, 2008). For example, De Vita and Kramer's (2008) research found that local community organizations were not well connected to social welfare programs and additional disaster recovery support. Likewise, Schlegelmilch and others (2020) argued that the national government should consider a "whole community" approach, which values the role of all agencies and organizations despite their differences in size and power when preparing for tropical cyclones.

External factors can impact how organizations coordinate. Green and others (2007) noted the potential for greater inter-organizational flexibility in coordinating a collective response to hurricanes: organizations need to be able to adjust what resources they offer and how they offer them. For example, when the COVID-19 pandemic arose in 2020 amid an active hurricane season, leading experts considered how organizations should tackle simultaneous disasters and risks (Phillips et al., 2020; Shultz, 2020). Ultimately, the typical disaster evacuation shelter protocols had to be balanced against protective measures to reduce the spread of COVID-19 (Phillips et al., 2020).

In most disaster recovery literature, inter-organizational coordination is framed as a benefit, with various shortcomings. Andrew and others (2020) present how neighborhood organizations can impede recovery by competing over scarce resources for their respective neighborhoods. In this case, interactions between organizations have adverse effects on organizations' ability to offer aid after a hurricane based on interpersonal dynamics between leaders of neighborhood-level organizations (Andrew et al., 2020). The present study will use the term "interaction" to describe the dynamic between FBOs and government agencies to move beyond the positive assumptions of coordination in disaster recovery literature.

2.2 Research Methods

This research is a case study of the resources offered by and interactions between FBOs and government agencies in Biloxi, Mississippi. The case study method was selected for this research because it provides an in-depth analysis of research, which allows for a rich understanding of how these organizations operate. Mississippi is an ideal place to research FBOs because 85% of adults identify as religious, and 72% attend

religious services (Religion in America, 2020). Furthermore, the case study method is ideal for Biloxi because the area's physical exposure to the Gulf Coast is distinct from, but related to, that of the surrounding area.

Biloxi's low elevation and coastal exposure put it at a high risk of hurricane damage (Valk, 2020). Biloxi has a population of 45,906 people and nowhere does it exceed 20 feet above sea level, which means hurricane flooding can impact a large portion of the population (Valk, 2020). East Biloxi is at the most significant risk because it is a low-lying, formerly marshy area that is prone to flooding even from relatively minor rainfall events (Wilson, 2018).

Over the last two years (2020-2021) in Biloxi, tropical cyclones Claudette, Ida, Cristobal, Laura, Marco, Sally, Delta, and Zeta have caused damage (see Section 1.1) (National Oceanic and Atmospheric Administration [NOAA], 2021). In 2021 both minor tropical storm Claudette and Hurricane Ida impacted the Mississippi Gulf Coast, including Biloxi. In the year before, 2020, tropical storms Cristobal, Laura, and Marco also impacted the area. Moreover, in 2020, Biloxi experienced Hurricanes Sally and Delta as Category 2 impacts. Finally, Hurricane Zeta was initially classified as a minor tropical cyclone, due to its sustained wind speed of 110 mph (NOAA 2021). Despite later being reclassified as a Category 3 storm and major hurricane, this research will analyze Zeta with other minor tropical cyclones that have impacted Biloxi because the arrival of national funds allocated for major hurricanes was significantly delayed because of Zeta's initial classification as a minor tropical cyclone.

From June to August 2021, semi-structured interviews were conducted with 22 faith-based leaders from 20 FBOs and 13 government leaders from 8 government agencies in Biloxi. The first participants were selected through online publicly available information about stakeholders, the subsequent participants were selected through snowball sampling. The interviews were guided by a theme-based interview guide and images of hurricane tracks over the last four years to jog participants' memories. They focused on the resources that organizations provide and their interactions with each other as they assisted Biloxi's residents in recovery from minor tropical cyclones over the last four years. The original interview questions also focused on how FBOs and government agencies perceived vulnerability and aided vulnerable people; results from these questions are presented in Chapter 3. However, this focus on vulnerability was redirected when some leaders from both kinds of organizations did not have a clear definition of vulnerability.

Interviews were transcribed with Otter.ai software and analyzed iteratively using QSR NVivo software. Each interview was then coded by key themes: from deductive analysis of the literature resources, interaction, and vulnerability. Key inductive themes: emergent from research are the financial backing for resources and perceptions of recovery. The following section outlines the primary findings from this analysis: recovery funding for minor tropical cyclones, recovery resources, and inter-organizational interactions.

2.3 Results

2.3.1 Government Agency and FBO Funds for Recovery from Minor Tropical Cyclones

The local government agencies and FBO leaders interviewed explained how their government agencies and FBOs have prominent roles in minor tropical cyclone recovery, including the provision of funding. This funding is provided partly by necessity: in their experience, the arrival of national funds is slow and restricted or not available for minor tropical cyclones. Additionally, many change their internal budget or operations to help the recovery effort.

There are two distinct kinds of government agencies. The first and most common include those that see it as their responsibility to help everyone. These organizations focus on safety and information for the public. The second kind of government agency is categorized as a social welfare organization, and it primarily prioritizes aiding the people already within the care of its social services.

Biloxi's local government hurricane recovery funds come from either local taxes or as a top-down allotment through the federal or state government. Interviewees from local government agencies indicated that most of Biloxi's government agencies' funds for minor tropical cyclones recovery come from their county budget. Any federal funds are dispersed based on a certain threshold of damages. As one government leader from an organization in charge of public safety explained:

They [the federal government] have upped the threshold, say a tropical storm comes in, and we receive a million dollars' worth of damage as a city. We probably will not receive anything. I think the threshold is four million. On top of that, we've got to

show all those damages through our damage assessments if we're seeking federal assistance to repair the damages. Even then, they review it case by case. The minor storms are trickier to get federal or state assistance for repairs in the aftermath (GOV5).

Several local government agency leaders explained how meticulous their documentation for the damage assessment paperwork needs to be. Even so, damage assessments are not a guarantee of funds. If they miss the threshold by a small amount, they do not qualify.

Because of national damage thresholds, Biloxi's government leaders continue to be unsure if or when they will receive funding for tropical cyclones whose classification could make them a minor tropical cyclone or major hurricane. Hurricane Zeta was an important example for Biloxi's government agencies' leaders because it was initially classified as a minor tropical cyclone in October and then reclassified as a major hurricane about two months later, at the end of December, as explained by one representative government leader:

If it's going to be a catastrophic [disaster], the President issues a state of emergency, and the states can follow suit... [The funding can then] trickle-down... For Zeta, they never declared a state of emergency because it came in as a category two [hurricane]. At the time [in October], President Trump did not declare a state of emergency. He waited to declare a state of emergency until December 31... That held up a lot of funding. We were well into millions of dollars of just debris cleanup. Finally, the federal government kicked in, and that was when we could start applying. We

[Biloxi's local government agencies] had declared a state of emergency and we were just waiting on the federal dollars, which is... the bigger pool of funds (GOV5).

This quote explains that national funds are only released after a federal emergency declaration, which may not align with the timing of state or county declaration of emergency or the needs of Biloxi residents.

One local government agency leader expressed concern about a federal funding loophole that expected the local agency to take financial responsibility for any physical damages to their agency from hurricanes and tropical storms that caused less damage than Katrina:

[We question] whether we can still receive assistance from [national government recovery agencies] in the event of an emergency declaration. Insurance had gotten... almost prohibitive for us to afford what we needed. After Zeta, when we started looking at our buildings, we had enough where we needed a new shingles. Because of how hurricane damage deductibles work, our deductibles were significant [and we were not sure how to cover them] ... After the first disaster, Katrina, we were funded in total [by the national government] ... However, the portion of deductibles now covered is only that in excess of the previous disasters. Meaning [only] damage greater than Katrina [is covered by national funding]. Basically, to me, that says you're not getting any help (GOV8).

The impact of financially covering the damages from minor tropical cyclones adds up as storms hit Biloxi frequently. Another government leader indicated that the recovery funds for many minor tropical cyclones comes out of local tax dollars. County and city government agencies can be forced to pay for repairs after minor tropical

cyclones. Several government agency leaders expressed how funds for minor tropical cyclone recovery come from their operating budget based on the difficulty and unpredictability of getting national funds. Some government agency leaders said they use funds from their operating budget for tropical cyclone recovery because the recovery work needed to happen before federal funds were disbursed. Others were skeptical that the funds would arrive at all.

FBOs in Biloxi, on the other hand, encounter different challenges with national funding and funding from within their FBOs. Biloxi's FBOs have two main types of funding that vary from FBO to FBO. Some FBOs are connected to a national network for disaster relief and aid work. These FBOs have access to a national boost of funding for their agencies and organizations following a major hurricane. However, for most FBOs, funding is entirely dictated by their congregation's ability and willingness to give.

Like government agencies, national funding available from FBO networks can be dependent on the size and impact of the hurricane, with national funding less likely in the wake of minor tropical cyclones. A boost of funding can also come from collective giving; when there are disasters elsewhere, the Biloxi FBOs give, and when there is a disaster in Biloxi, other FBOs, primarily in the same denomination, give back:

Our national organization is so generous. [After] the last two significant disasters [hurricanes], they've offered us money... We worked some pilot programs nationally because we're ready to go all the time with case managers and with funding. We'll go in, get it started and then hand it off. We're not territorial or possessive (FBO9).

Fewer FBO leaders mentioned national interfaith funds and hurricane recovery support; interfaith funds are less common and seemed to only be offered after major historic hurricanes like Katrina.

The national funding for FBOs recovery work is different from government agency funding because it arrives immediately and is used at the FBO leaders' discretion: "We can do what is within our scope of services, with no national direction when we get national support [from our denomination]" (FBO9). Many FBO leaders discussed how they did not have layers of bureaucracy in their way and how quickly they were able to start providing resources after tropical cyclones. These FBO leaders chose how and in what ways to allocate their funds, creating the flexibility to adapt their spending to community needs. For example, if people in Biloxi needed more tarps after a tropical cyclone, they could efficiently buy more tarps with their funds. Most FBOs lack the kind of written regulations that government agencies must follow: most had internal protocols with varying levels of formality, from written hurricane guides to a hierarchical structure for decision making.

Several of Biloxi's FBO leaders differentiated funds as those provided by their denomination, by other denominations, and interfaith funds. One effect of FBO differentiation was that a few FBOs accepted funding from all FBOs but only funded FBOs of their denomination on a local and national level. Many focused more on the mission and resources of another Biloxi-based FBO than the denomination when giving another FBO funding. Several took pride in their interfaith work and co-funding specific recovery efforts, like raising the funding to provide a certain number of meals.

The second FBO funding source primarily used by FBOs comes from congregants' donations. Some FBO leaders are reliant on their congregation to gather resources and funding for recovery efforts. As one mentioned, "All this food comes either from donations from our church members, or sometimes we will do a food drive and ask people to bring certain items to help restock our pantry" (FBO7). According to many FBO leaders, their FBO's aid for the community is intermittent. Several explained that their aid work is run by one or a few enthusiastic volunteers making their assistance unstable and unpredictable. These FBOs also demonstrated that their resources and funds first went to their congregants.

National funds for local government agencies and FBOs have been more directly allocated for recovery from major hurricanes. However, there are some key differences in how national funding is structured for government agencies and FBOs. Government agencies must wait for an emergency declaration and meet damage thresholds to get funding; but even if a government agency follows these protocols, they may still get caught in a loophole and not receive funding. In contrast, aid focused FBOs receive efficient national funding from their denominations, which is then used by FBO leaders for relief at their own discretion. Other FBOs, without a national denomination network, rely on their congregants to provide irregularly available funds to support tropical cyclone recovery. Ultimately, funding for minor tropical cyclone recovery can be outside the national funding scope and a strain for local recovery efforts, especially for FBOs with unstable aid programs.

2.3.2 Government Agency and FBO Resources for Recovery from Minor Tropical Cyclones

This section of the results compares the resources offered by government agencies and FBOs after minor tropical cyclones. First, this section will describe the resources offered by local government agencies after minor tropical cyclones. Next, this section expands on the role of FBOs by considering the complexity of the resources that FBOs provide after minor tropical cyclones in contrast to the resources provided after major hurricanes. Finally, this section presents the role of faith in how FBO leaders approach resource allocation.

A lack of national funds has substantially impacted the resources offered by government agencies in the wake of a minor tropical cyclone. Local government agencies have offered few physical resources, all funded by the state government: they dispensed sandbags before a hurricane and a supply of blue tarps and cleaning supplies after. Local government agencies also reported that they provide financial resources to aid Biloxi residents' recovery from minor tropical cyclones. However, the main social resources offered by government agencies were personnel and safety protocols.

The primary concern of the Biloxi Fire Department, Biloxi Police Department, and Harrison County Emergency Management and some other local government agencies after minor tropical cyclones was community safety, and they were attentive to who had evacuated and who had not. These government agencies used their standard zoning and knowledge of the community to inform where they allocated safety personnel and put emergency zoning into place. Before minor tropical cyclones, these local government agencies are prepared for a rapid change in circumstances and are ready to assist with

rapid evacuation at scale. The parameters of what local government agencies do to assist after minor tropical cyclones is laid out by written protocol. Thus, even when local government agencies face a higher demand on their safety personnel or social resources, they are prepared.

Government resources are standardized, and these resources are equally available to all Biloxi residents. Likewise, FBOs often have some non-emergency resources available, but the majority increase their resources after minor tropical cyclones to match the specific needs of Biloxi residents. Unlike local government resources, a lack of national funds has drastically impacted resources offered by FBOs in the wake of a minor tropical cyclone.

The primary difference felt by FBO leaders between minor and major tropical cyclones was how dependent Biloxi residents were on those resources. Following all tropical cyclones, FBOs provide physical resources like food, clothing, toiletries, and other household items. Pop-up locations are meant specifically After major hurricanes, shipments of physical resources are channeled through local or state government agencies and FBOs. However, after minor tropical cyclones, most of the physical resources listed above are provided solely by Biloxi's FBOs.

The contrast between physical resource provision following major and minor tropical cyclones is further explained through a specific example of resource shipments. Following major hurricanes, many national government agencies and FBOs ship in individual meals and other forms of emergency food. After minor tropical cyclones, there are fewer ways for people to receive meals, and according to FBO leaders, more people come to their food pantries:

After Zeta, we did not gain any resources, no grants or anything like that... we continue with what we were doing before. [After Zeta, the] church was without electricity for three or four days... [Even so] we were able to [be] back up and running almost immediately. We didn't do anything extra, other than open our food pantry. Generally, we have set dates and times we serve, but...our goal was to be back open and available as quickly as possible (FBO5).

Many of the FBOs interviewed have a food pantry or actively contribute to another FBO's food pantry. FBO leaders mentioned other ways that they stretched their supplies to help their communities after minor tropical cyclones beyond the extended food pantry hours mentioned in the quote. Yet, some were able to offer more food in their food pantries, and others were not. One FBO leader framed it as "we help our congregation first, and then if we have requests come in from community members we'll help if we can" (FBO11). Quite a few of these FBOs with food pantries were donation-based and limited in what they could offer the wider community.

Additionally, FBOs must overcome hurdles in providing resources after minor tropical cyclones that government agencies do not have to consider. For example, the resources distributed at pop-up locations are meant specifically to aid with tropical cyclone recovery; yet these locations are challenging for people to find:

People lined up for hours in the hot sun, waiting for water distribution in places it would never come. We listed pop-up distribution points [of water, food, nurses, and mental health services]. We kept the media informed, we're here for the next three days. But somebody on social media or the radio said another location... [I drove by

and told folks] nothing will be here. It's four blocks away. And they still decided to wait there (FBO8).

When the public cannot find pop-up resources, as FBO leaders noted, those resources are wasted and puts a strain on other FBOs. The resources at pop-up locations reveal one of the challenges of getting resources to Biloxi residents.

Another concern is that financial resources offered to support Biloxi's residents have been different after major and minor tropical cyclones. In the wake of major hurricanes, national government funding is distributed for housing repairs. Biloxi's local government agencies receive most of their financial resources from federal government agencies.

FBOs are not the same as government agencies; they can provide only limited direct funds after major and minor tropical cyclones. Most FBOs provided residents with a gas card or money for a specific need in the five-to-30-dollar range. Some \$50-1000 based on someone's story to help with a bill or repair, but assistance is subjective and only available until funds run out. What financial resources FBO leaders can offer is unreliable, and a lack of national funding for house repairs has also strained FBOs in recent years.

As a social resource, home repairs demonstrate how essential FBOs are in supporting residents after minor tropical cyclones. In the wake of minor tropical cyclones, home repairs switch from financial resources to social resources because there is no national funding to recover the repairs. Many FBOs have a crew or several crews who repair roofs and pick up debris from tropical cyclones. Some FBOs have a volunteer training program and have an experienced leader on each crew. The most common effect

of COVID-19 in recovery from tropical cyclones was a shortage in volunteer labor because people were concerned about their safety. Several FBO leaders explained that many of their work crews were composed of retired 65+-year-old volunteers who were concerned about contracting COVID-19. The COVID-19 pandemic revealed how easily destabilized this much-needed social resource of home repairs can be. FBO leaders expressed the challenge of keeping up with the number of people who requested their help and shared that many people thought they would be guaranteed help with recovery.

According to FBO leaders, the influx of financial resources after major hurricanes can make Biloxi's residents unconcerned about the costs of upcoming tropical cyclones. Several government agencies and emergency-service-based FBOs expressed concern about how Biloxi residents assume and are encouraged to believe they will receive the same kind of funds and help that they did after major hurricanes:

You have preachers, you have people who don't know a thing about it, tell them don't worry. The government's going to come in and rebuild your home, or the government's going to come in and give you money (FBO8).

The concern of these FBOs is that they have repeatedly seen the financial resources not come after minor tropical cyclones. Several FBO leaders explained that those Biloxi residents could not get financial resources from the government after minor tropical cyclones came to them. FBO leaders expressed wanting to help if they could, despite their frustration with funding misinformation, because people did not have insurance or any other means of fixing their homes.

Recovery resources from FBOs are inconsistent because FBOs have no formal obligation or protocols to offer resources of any kind after tropical cyclones. FBO leaders feel it is their responsibility to help support the community with resources. Many described this responsibility on a personal-faith level and as part of their organization's mission statement. Many FBO leaders wove their understanding of ministry and shared the gospel during their aid work; they reported that they perceived ministry as one of the social resources they offered to residents.

The term 'ministry' suggests establishing forums of preaching holy texts, praying with people, recruiting for one's church, and inviting others to join a FBO. Many of the FBOs interviewed communicated that ministry was necessary, often offered in conjunction with physical resources and repairing homes. Many FBOs regarded ministry as a valuable resource they offered in conjunction with other aid. One leader framed the inclusion of ministry when they gave out food in the following way: "You can have all the food, water, and shelter, but if you don't know Jesus, then I feel like you're missing the most important aspect" (FBO19). These FBO leaders who offered ministry alongside other resources expressed how many of them were a FBO first and foremost. Many FBOs regarded ministry as a valuable resource they offered in conjunction with other aid.

The FBO leaders that offered house repairs indicated that they had more requests to help people than time to help. Thus, they had to prioritize their congregations and people within their social networks. A few FBOs said that when they were able to help a stranger, the act of helping was impactful for them personally. Yet, their resources, they noted, made aiding strangers a challenge.

She [the recovery aid recipient] kept saying, I need to know how much I owe. They don't owe us anything. This is our ministry. It's all volunteer work. And that it was impactful. We prayed with her. And she's gotten back into a church family now (FBO12).

Those faith-based leaders who did help strangers expressed navigating the moral side of helping people recover from minor tropical cyclones. These leaders expressed the tension they felt when helping people who did not follow the same doctrine:

We help people regardless of who they are; that is a challenge sometimes. We were mucking out a house, and my team discovered stacks of adult magazines and lots of alcohol. But that family had children – they needed help (FBO14).

These FBO leaders expressed the complexities of beliefs that come up for them when their aid work necessitates them withholding judgments about those they are helping. Even with strained resources, many FBO leaders expressed their desire to adapt their organizations to give all they can.

FBO leaders laid out many ways the FBOs provide physical, financial, and social resources after minor tropical cyclones. Furthermore, FBO leaders explain the need for these resources and the ways they are straining to serve. When FBO resources are limited, FBO leaders expressed that they must prioritize those Biloxi residents who have a congregation.

2.3.3 Government Agencies and FBOs Interactions when Offering Recovery Aid After Minor Tropical Cyclones

The interactions among government agencies, FBOs, and those between government agencies and FBOs is particularly important after minor tropical cyclones, in part because national funds and aid have been primarily implemented after major hurricanes. First, this section presents the ways that these interactions and social connections have benefited minor tropical cyclone recovery. Then, this section will explain how interactions can also be detrimental by scrutinizing the way that FBO referrals overwhelm other FBOs. Finally, this section explains why several FBO leaders think referral list systems impede recovery work.

Many leaders, government and faith-based, explained the role of community in their recovery work. FBO leaders expressed a couple of main reasons for working together, such as to aid people who otherwise might not get assistance. This is demonstrated in the following quote:

Above all, we need cooperation because without cooperation, we fail to help the community with the assistance they absolutely need. We need all to work together because otherwise, pockets of people out there with need get left behind (FBO2).

The second reason was that FBO leaders thought working with organizations helped them adapt their aid to new circumstances by pooling resources or changing locations. However, FBO leaders did express limitations to what working together allowed them to accomplish. For example, the external factors of COVID-19 disrupted normal home repair collaborations because there was a shortage of volunteers across most FBOs. Under other circumstances, another FBO could fill one organization's

volunteer gap. Amongst the FBO leaders interviewed, there was a strong sense of community, whether that was just their congregation, a few FBOs they work closely with, or all the government agencies and FBOs that chip in after a minor tropical cyclone.

When FBOs are socially connected, communication can help them avoid offering overlapping resources and promote collaboration on recovery efforts. For example, one FBO that supports the homeless communicated with another FBO nearby and realized that both groups had been serving lunches. The first FBO was then able to use their resources to provide other support rather than providing lunches.

One board with government and FBO leaders on it, was specifically created for long term tropical cyclone recovery. This board's role is to help interorganizational communication about physical and social resources. This board helps the government agencies and FBO leaders strategize how to provide aid in real time. For instance, one agency or organization can identify an area that needs assistance, and, through connections on the Board, other agencies and organizations can learn about it and step in. Or, if there are mixed resources offered, the board can help coordinate what is offered where. For example, the board connected tarps provided by a state government agency with FBO volunteers that needed them to help cover damaged roofs. This board only connects some organizations and agencies; FBOs without congregations were more likely to serve on the board, work with government leaders, or be recognized as key actors to other government agencies and FBOs. The board, however, provides an example of how resources and efforts can be coordinated between FBOs and government agencies.

Referrals are the main way, beyond direct communication or being a part of the recovery board, that social connection-based interaction informs recovery work. Yet, at

times, referrals disrupt recovery aid work. After minor tropical cyclones, most referrals were from one FBO to other FBOs based on the types of resources they offered in comparison to local government agencies who only provided safety personnel. Communication between FBOs is the key difference between most successful and unsuccessful referrals.

At their best, referrals are communicated beforehand. For example, one FBO leader explained that they only refer people to a specific person they know at another organization or call that organization before referring someone. Another FBO leader explained that even the organizations they partner with prefer a referral contextualized to the person receiving aid with, “[These people] have helped people with this in the past, but I cannot guarantee that they have the resources to help you” (FBO13). Additionally, a well-made referral can help match people with the organization best suited to help with their needs.

However, most FBO leaders reported frustration about the frequency of inaccurate referrals. Inaccurate referrals can inconvenience the organizations that are getting referrals. Additionally, if the FBOs being referred to cannot help the person, that person must go to yet another place. Many FBOs talked about how other government agencies and FBOs will “just pass the buck” or send along a person instead of fully helping them.

If one FBO did not communicate with the FBO they are referring someone to, then that can be challenging for the FBO receiving referrals. Several FBOs that dealt with having people dropped off explained that the experience can be “overwhelming.” For

instance, one said: “This is not a shelter. I mean, you can't expect people to just drop them off here. And we're supposed to take care of their needs” (FBO18).

They noted that many people had been dropped off with inaccurate information about what the FBO was going to do for them.

Some FBO leaders suggested improving referrals through creating a shared list of which organizations offered what to better coordinate agencies and organizations between organizations. In fact, several FBOs developed and distributed referral lists. However, these lists can quickly become inaccurate. Interviewee FBO5 noted that:

Other agencies have you on a list, and you would do this, but that list was ten years old, when we used to have a clothing closet, we don't have clothes anymore. But it won't change on the list (FBO5).

According to several FBO leaders, the resources offered can frequently change, even monthly. While helpful at times, lists can also let down organizational leaders and the people they aid:

Somehow. years ago, we must have got on a list, and they keep handing out that list. Periodically, I get someone that's very upset with me [because I can't help them]... I've contacted Mississippi Power and they tell me that our name's off the list. It's good for about a month and then I get phone calls again (FBO13).

This leader explained how people get frustrated with them when they come to get utility assistance that they have never offered. Other examples of how lists have been a convoluted system in Biloxi are through the uncommunicated and inaccurate referrals that can stem from list errors. The organizations using lists handed them out and

presented them as a direct way to receive help regardless of how recent, complete, or accurate the information is.

2.4 Discussion

FEMA aid is released after a State of Emergency Declaration (FEMA 2021) and is less likely after a minor tropical cyclone (Jerch et al., 2020). This thesis's findings concurred with the broad Gulf Coast natural disaster literature, which critiques how hurricane recovery resources are allocated. This thesis works towards addressing research gaps by considering the roles of small community organizations, government agencies and FBOs. It also answers Griego and others (2020) call for examining how inter-organizational practices impact tropical cyclone recovery. This thesis also researched the gap presented by Andrew and others (2020).

To address these gaps, I first considered how funding impacts the role of local government agencies and FBOs in Biloxi during minor tropical cyclone recovery. Then, how local government agencies and FBOs provision and allocate resources. Finally, to reflect on the gap of Griego and others (2020) research, and to further build on the roles of Biloxi's government agencies and FBOs, this chapter scrutinized the interactions between government agencies and FBOs.

Funding for minor tropical cyclones, as addressed by FEMA (2021) and Jerch and others (2020), aligns with what government agencies and FBO leaders discussed. But the literature reviewed did not discuss the thresholds of funding that government agency leaders contend with, the loopholes they can end up in, or the way that not having national funding can impact their internal budgets.

Furthermore, the Gulf Coast recovery literature only vaguely describes the financial hardship of FBOs when disaster recovery is underfunded (Williams and Jacobs, 2020). This research reveals how such pervasive underfunding undermines the stability of FBOs. Congregant-led FBOs are especially susceptible to this destabilization as they try to adapt to community needs after tropical cyclones even when funds are scarce.

Resources, as defined by Green and others (2006) were represented as inequitable because FBO leaders prioritized their own congregants, just as described by Lui (2020). This chapter expands on those findings and shows how not having national funds or resources burdened FBOs. In the wake of minor tropical cyclones, FBOs provided necessary resources to Biloxi's residents even while navigating the extenuating circumstances of COVID-19. FBOs are not obligated to provide recovery aid after minor tropical cyclones, but they choose to provide aid as part of the way they practice their ministry. Many FBO leaders expressed the strain of providing so much and those leaders helped their congregants first because they only had a limited amount to give.

Interactions between government agencies and FBOs have been shaped by social connection, as introduced by Andrew and others (2020). Issues with communication as part of coordination have impeded recovery as well as the impact of the COVID-19 disaster recovery as predicted by Phillips and others (2020). However, according to FBO leaders, COVID-19's largest impact was its depletion of the volunteers who usually help with house repairs. This volunteer shortage showed how easily FBO volunteer programs can be disrupted, and how unstable FBO recovery support can be. The largest gaps in interactions were found between FBOs with other FBO's referrals lists, which had outdated information because FBO resources change frequently, even monthly.

Additionally, poorly made referrals can overwhelm the FBOs that people are being referred to. The referrals demonstrate how FBOs have managed considerable recovery work after minor tropical cyclones without governmental supporting systems in place. Yet, there is some change as some cross-FBO-and-government community boards have formed. Some effective communications have allowed FBOs to redirect resources away from areas of overlap. Referrals made through personal connections between FBOs have helped Biloxi's residents get the aid they need. It is now a matter of creating both more constructive interaction and external support.

2.5 Conclusion

The impact of minor tropical cyclones in Biloxi has been shaped by recovery support from both FBOs and government agencies. Moreover, this support has been defined by the provision and distribution of resources based on the interactions between these relief organizations. The roles of local organizations are shaped by their formal and perceived responsibilities to their communities and the resources they offer. Interactions between organizations demonstrates that there are ways to effectively collaborate or coordinate resources through direct communication. And there are ineffective ways for FBOs and government agencies to interact through referral lists and uncommunicated interactions.

Questions that remain unanswered in Biloxi, Mississippi, are: How well-received and helpful are the resources available to the vulnerable people receiving them? How is the role of FBOs and government agencies different depending on whether a storm is a minor or major tropical cyclone? What is the cumulative impact of tropical cyclones on FBOs' funding and aid work? (See Section 4.2.2) Additional comparative case studies

may examine how FBOs, and government agencies operate with national support systems to answer these questions.

Finally, the roles of FBOs and government agencies during minor tropical cyclone recovery should continue to be researched to better understand the ways that smaller-scale disasters are handled in small-to-medium-sized religious areas. Schlegelmilch and others (2020) suggest a more holistic approach to government and non-governmental organizations dealing with disaster recovery. The value of this research is in presenting the complex and dynamic roles of FBOs and government agencies in recovery from small-scale disasters.

CHAPTER III - Vulnerability and Recovery After Minor Tropical Cyclones

3.1 Introduction

Urban populations along the Gulf Coast have doubled over the last 100 years, despite the increased risk of tropical cyclone impacts (Shao et al., 2020). In 2021, Biloxi's residents suffered minor damage from tropical cyclone Claudette and the indirect impacts of Hurricane Ida (NOAA, 2021). In the previous year, 2020, five tropical cyclones impacted Biloxi's residents with minor tropical cyclone force winds and one with category 3 level winds (NOAA, 2021). Despite ongoing research about the social vulnerability on the Gulf Coast, federal recovery funding is predominantly only provided after major hurricanes (Jerch et al., 2020) (See Sections 2.1.1 and 2.3.1). Therefore, local agencies and organizations provide much of the resources and services after minor tropical cyclones to address the vulnerability in Biloxi (See Sections 2.2.2 and 2.4.2).

Hazards literature has presented various frameworks and indexes to demonstrate vulnerability. These include, for example, the sociological and geographical lens, a place-based model, and a philanthropic approach (Bohle, 1994; Cutter, 2008; Schlegelmilch, 2020). Recent hazards research has created one of the most comprehensive lists of vulnerability called the Social Vulnerability Index (SVI), which considers how the following factors are measures of vulnerability: resources, age, education level, gender, income, employment, housing, and hazards risk (Shao et al., 2020; Bjarnadottir et al., 2011). According to the SVI, the Gulf Coast has one of the highest rates of social vulnerability in the United States (Shao et al., 2020). However, the SVI cannot cover all the dimensions of vulnerability, and the equations do not account for the nuances of how these vulnerabilities compound with each other.

One dimension of vulnerability to consider in Biloxi is poverty. Mississippi has a poverty rate higher than the United States average poverty rate of 19.6% compared to the national average of 12.8% (United States Census Bureau, 2020). The intersection between poverty and other forms of vulnerability needs to be considered (Gault et al., 2005), particularly because tropical cyclones can impact key issues related to poverty, such as infrastructure and property, financial stability, and mental health (Cain and Barthelemy, 2008; De Vita and Kramer, 2008). Yet, poverty is not always included as a measure of vulnerability to or recovery from tropical cyclones (Curtis et al., 2007).

Further, coastal Mississippians' social vulnerability can overlap with the risk of physical exposure to minor tropical cyclones (Shao et al., 2020). Physical geography contributes to Biloxi residents' risk of damage from tropical cyclones especially as Biloxi has low elevation and extended coastal exposure (Valk, 2020). Biloxi has a moderate hazard threat from hurricanes and has an 'elevated' SVI, corresponding to the highest category on the scale of Shao and others (2020). The moderate hazard threat means that Biloxi is at risk of being impacted frequently and severely by tropical cyclones; while the 'elevated' SVI indicates that many of the social vulnerability factors from the SVI are present in Biloxi.

Vulnerability can also concern a person's identity as part of a minority group: hurricane recovery studies on the Gulf Coast illustrate how women (Gault et al., 2005), Latinx people (Muñiz, 2006), and African Americans (Morse, 2008) experienced disproportionate risk and vulnerabilities related to tropical cyclones. Women of color are particularly likely to be negatively impacted by tropical cyclones and experience more significant recovery challenges because of the social disadvantages that they face (Gault

et al., 2005). For example, African American and Latina women statistically have been more than twice as likely to be living in poverty than white women (Gault et al., 2005). Latinx individuals also often contend with a language barrier or are concerned about their legal status, which can increase their vulnerability to impacts (Muñiz, 2006). During Hurricane Katrina, East Biloxi was affected by storm surges from both the oceanic shoreline to the south and the bayside shoreline to the north, putting the predominantly African American households located there at higher risk of physical exposure (Morse, 2008).

Fundamentally, how efficiently and fully people recover from natural disasters is directly related to the aid they receive (Shinn and Caretta, 2020). Various government agencies and FBOs contribute to aid work and government agencies have designated responsibilities based on whether the agencies are organized on the national, state, or local levels (Brown et al., 2020). Furthermore, FBOs can be categorized as either social services-oriented or congregation-focused (McGinnis, 2011) (See Section 2.1). How government agencies and FBOs interact while providing resources and services is complex (See Sections 2.1.3 & 2.3.3).

This chapter uses a qualitative approach to consider how FBOs and government agencies in Biloxi defined vulnerable people and helped them recover in the wake of minor tropical cyclones over the past four years. In this chapter, I compare the perspectives of FBOs and government agencies. The chapter is structured around three main arguments: (1) Minor tropical cyclones disrupt people's lives; (2) Vulnerability is multidimensional; and (3) Tensions exist between community relief and individual recovery.

3.2 Research Methods

In this chapter, this case study of Biloxi considers how government agencies and FBO leaders perceive vulnerability to and recovery from minor tropical cyclones. However, these perspectives must be contextualized by the demographics of Biloxi's residents. East Biloxi has a larger proportion of African American and Asian residents than the rest of Biloxi, which is primarily white (Race and ethnicity, 2018). Additionally, East Biloxi has been historically socioeconomically disadvantaged (Lowe, 2012; Wilson et al., 2018). Therefore, this chapter will consider vulnerabilities specific to East Biloxi as well as vulnerabilities with Biloxi as a whole, but it is important to consider the context in which East Biloxi residents may experience storm damage.

During June-August 2020, semi-structured interviews were conducted with 22 faith-based leaders from 20 FBOs and 13 government leaders from 8 government agencies. These interviews focused on how organizations perceive vulnerability and how they aided vulnerable people in their recovery from tropical cyclones over the last four years. Interviews also focused on which resources the organizations provided to community members and the interactions between organizations. During semi-structured interviews, participants were guided to contain their answers within the discussion of minor tropical cyclones. Participants were selected using snowball sampling techniques (for more detailed methods reference Section 1.4). Interviews were transcribed by Otter.ai and transcriptions were edited for accuracy. Then the transcriptions were analyzed with NVivo and coded thematically using codes entitled *Vulnerability*, *Recovery*, *Resources*, and *Interactions* as presented in the following results section.

3.3 Results

The following results describe how government agency and FBO leaders perceive vulnerability to and recovery from minor tropical cyclones. The first section (Section 3.3.1) provides a brief introduction of how minor tropical cyclone damage can be destabilizing and compound with other intersecting forms of vulnerability. Next, Section 3.3.2 expands upon how East Biloxi's physical geography and demographics increase physical exposure risk and vulnerability. Further exploring perceptions of vulnerability, the next section (Section 3.3.3) explains how local government agencies and FBOs defined and explained vulnerability in a multitude of ways, ranging from, "All Mississippians," (GOV1) to "Vulnerability happens on any level, race, creed, gender, socioeconomic status, or religion," (GOV8). 4) Finally, the last section (Section 3.3.4) considers recovery and how perceptions of vulnerability impact FBOs' and government agencies' definitions of recovery. These results exemplify the complexities of both vulnerability and recovery.

3.3.1 The Impacts of Minor Tropical Cyclones

Several leaders from FBOs and government agencies have highlighted how minor tropical cyclones can be disruptive and damaging: minor tropical cyclones can have major impacts on people's lives. As an isolated disaster, a minor tropical cyclone might be much more manageable, however, compounding with other emergencies, a minor tropical cyclone can be a major disaster. For example, a government leader explained that if a family uses rent money to evacuate from a minor tropical cyclone, this may increase that family's financial risk and could result in them becoming homeless (GOV4). A quote from a FBO leader also expressed the general public's perception of minor tropical

cyclones, and how those perspectives contrast with their own understanding of minor tropical cyclones' aftermaths:

The minor tropical cyclones seem minor to the world watching. But oftentimes [they] can cause just as much financial hardship [as a hurricane], just as much damage and destruction... [there is an] additional layer of recovery that pushes some families over the edge (FBO11).

A government agency leader working on community development expressed how minor tropical cyclones can create disruptions for people by compounding with other life situations.

We tend to say, "Oh, yeah, that was minor in a very dismissive manner" ... [But] It's not a complacency issue... it's choosing between a bad and a worse option... even if it's [a] minor [tropical cyclone] it can have a bigger effect, just because of the compounding factors... we must look at [it], on a broader scale, in terms of increasing resilience (GOV4).

This government agency leader, along with the above faith-based organization leader, explained the nature of minor tropical cyclone damage as it compounds with other forms of vulnerability and instability.

Three government leaders from one government agency expressed how improved infrastructure does not necessarily protect Biloxi's residents from minor tropical cyclones if those residents are in the low-lying area of East Biloxi. Another FBO leader explained how the flood damage caused by Minor Tropical Cyclone Claudette was a concern in the low-income and lower elevation areas of Biloxi but was not as significant for other areas of the city. Meaning, minor tropical cyclones are a heightened risk to East Biloxi, which

has the lowest income and elevation in Biloxi. Therefore, East Biloxi is also more vulnerable to minor tropical cyclones than the rest of Biloxi. The next section expands upon how FBO and government agency leaders consider East Biloxi's physical exposure and vulnerability to minor tropical cyclones.

3.3.2 Physical Exposure Risk and Vulnerabilities in East Biloxi after Minor Tropical Cyclones

For residents of East Biloxi, the physical geography of their neighborhoods offers an ever-present layer of risk exposure – as described in this paper's case background and methods (Section 1.4.1). The following quote from a government leader demonstrates their awareness of the increased vulnerability in East Biloxi:

The West End of the city sits a little bit higher than the east end of the city... [During a minor tropical cyclone, the] storm surge [is split] from almost the dividing line between East and West... north or south of the railroad tracks, at the east end of East Biloxi or the west end of East Biloxi has a gradation of damage as well (GOV2).

The physical exposure to tropical cyclones is not uniform in East Biloxi. The East end of Biloxi has shorelines to the north and south, increasing the risk of flooding on both sides of the railroad tracks. This quote illustrates that even within the community, there are gradients of physical vulnerability within Biloxi and within East Biloxi.

Another physical consideration is infrastructure. The City of Biloxi is still working on infrastructure recovery from Hurricane Katrina, and additional damage from more recent tropical cyclones has added to the recovery needs:

In the East Biloxi area, on the point, they are replacing water, sewer, and drainage.

We just finished construction for the north contract, located in East Biloxi... And all

of that is back from Hurricane Katrina, and right now, we have hurricane Zeta damages [too] (GOV6).

Government agency leaders in Biloxi are aware of the ongoing infrastructure damage in East Biloxi. Mississippi's history of hurricanes and long-standing poverty provide a wider context to understand minor tropical cyclones recovery as presented in the literature and in several government agency and FBO leaders' framing of vulnerability in Biloxi. In the Gulf Coast Disaster Recovery Literature, first Hurricane Camille struck in 1969 (Hayden, 2010). Then Hurricane Katrina in 2005 and soon after the BP Oil Spill in 2010 (Shao et al., 2020; Cutter et al., 2014). Additionally, Mississippi's high and long-standing poverty rate (Sherman & Trisi, 2015) all contribute to an underlying level of vulnerability:

Many places have hurricanes, but the oil spill, Hurricanes, and homeless... here [have] become a disaster. The generational housing and [the] generational poverty here are exacerbated by all the disasters (FBO9).

There are various ways that these factors intersect and impact individual life in the context of tropical cyclones. The whole of East Biloxi is physically exposed to damage from a tropical cyclone in a way that overlaps with other physical vulnerabilities such as old homes or coheired homes (intergenerational housing that is deeded to many people). There can be difficulties with deeding a house to multiple people that impede home repairs:

[In] East Biloxi, it gets complicated; there are coheired homes. The most I've ever seen is 11 people, and only one person had lived in it for the last 30 years...

Everybody needs to sign off that person gets to remain in the home. If you don't, you

make a shiny new home, and then people say we're going to Airbnb it, or I want to live there. [Then] they bleed out the other person. They have no house note, no rent, no mortgage, and no insurance. When it's a home, but it's undeclared, [and] they don't have the money to rebuild (FBO9).

There are issues with coheired homes exposed by tropical cyclones. Coheired homes are often older and more susceptible to storm damage, even from minor tropical cyclones. Several faith-based and government leaders expressed how older homes are often at higher risk to physical damage from storms since they often lack the retrogrades to help prevent hurricane damage as required in new construction projects. Having a coheired home can translate into a physical vulnerability risk if the primary resident is unable to receive physical repair assistance because others will not sign off on repairs or a resident's lack of a formal deed obstructs aid offered to them.

Another compounding factor of vulnerability that intersects with physical exposure risk is that of language barriers. The present research found that local faith-based and government leaders saw the immigrant communities of Biloxi as vulnerable:

[People don't know] Latinxs are in East Biloxi, they assumed it is African Americans, but there are also many Latinxs, and they don't speak English. I mean, it's to where the kids are in here translating for the parent (FBO10).

This FBO leader explained the language barrier that Latinx people must overcome to receive disaster recovery assistance and day-to-day support. Specifically, they highlight how the language barrier is an issue even before a tropical cyclone hits. Access to information about how to prepare for tropical cyclones and their risks is essential for community resilience, especially in East Biloxi. However, the local government recently

decided to stop translating and handing out information in languages other than English due to its cost:

Lower income [households] sit lower. This area [(East Biloxi)] is impacted by hurricanes. Because it is a lower-income area, there are a lot of minorities, and there is a language barrier. Our information is online now. We used to have handouts that went out to the whole city, the last couple of pages were translated into Vietnamese. We don't have that anymore. They can translate it online, but we don't know how many do or how accurate that is. And we don't know how many have access to the internet (GOV3).

Many FBO and government agency leaders linked limited access to tropical cyclone information and vulnerability. The concern of physical exposure compounding with other vulnerabilities might be less impactful elsewhere, but in East Biloxi, coheired homes and language barriers can add significant additional steps to an already challenging and complex recovery process.

3.3.3 Government Agency and FBO Leaders' Definitions of Vulnerability in the context of Recovery from Minor Tropical Cyclones

I don't assume that they [people in low-income households] can't recover without help or need me to speak for them; that's insulting to people. And vulnerability can happen on any level, race, creed, gender, socioeconomic status, or religion. People are more capable than we give them credit for (GOV8).

The above quote is from a government leader who works with people on government assistance. This interviewee was careful throughout their interview to communicate a sentiment of helping and empowering people to create their recoveries

from minor tropical cyclones. Some other government agencies and FBO leaders also shared this complex understanding of vulnerability. However, this was not the only definition of vulnerability.

A few government leaders considered, “All Mississippians as vulnerable to a disaster,” (GOV1). Some were unwilling to broach the topic. Another defined vulnerability based on the severity and movement of the tropical cyclone, “Whoever had the worst exposure was most vulnerable,” (GOV5). Other government personnel used more refined definitions of vulnerability including several government leaders who considered the challenges of poverty while recovering from minor tropical cyclones:

I think we tend to focus on color, but in our smaller communities, poverty, in general, produces huge inequities in how people receive information and ... the number of steps it takes to do a small task (GOV4).

Government leaders’ definitions of vulnerability to hurricanes showed varying levels of nuance. They seemed to fall on a continuum of perceptions that spans from, everyone in Biloxi is vulnerable to an understanding of diverse vulnerability considerations on an individual level.

Many participating faith-based leaders defined vulnerability as either circumstantial or, in one case, a self-created condition. A few FBOs leaders considered vulnerability an individual’s inability to meet their own basic needs. Other FBO leaders expressed concern about individual circumstances that contribute to vulnerability. For example, one interviewee highlighted, “Elderly people in older homes that are not at the current code,” (FBO 1) as being particularly vulnerable. Another mentioned a lack of access to potable water, asking, “Do they have running clean water? If they do not, I will

get them cases of water, whether [or not] it's \$5 a gallon,” (FBO 4). Multiple FBO leaders considered individuals at fault for putting themselves in a position of vulnerability when exposed to minor tropical cyclones:

The biggest issue that is not addressed is mental health. The vast majority [of vulnerable people] are homeless because of their decisions by self-medicating with drugs or with alcohol and behavioral choices (FBO 5).

Another FBO leader expressed frustration with impoverished people “wasting” their money on tattoos and renting large TVs instead of being able to take care of themselves after a hurricane. This leader critiqued other faith-based leaders who tell people the government and faith-based support organizations will provide their recovery needs, “It makes people complacent,” (FBO8). Additionally, one leader framed a lack of information as those who, “Aren't aware,” or who neglect to be aware, remarking that they would face issues even in a small storm if the electrical grid were affected:

[The most vulnerable people] aren't aware or neglect to be aware of the easy things. Like stay away from the water and get out of the low-lying areas. But it doesn't take much of a storm to create problems for people. If the electricity goes out, that's a problem (FBO7).

In contrast, one faith-based leader shifted the focus to inadequate communication as a fundamental cause for minor tropical cyclone vulnerability:

People who don't have television or internet or radio, who aren't tuned in and don't know what's going on—they're the most vulnerable, and then those in low-lying areas (FBO 6).

Many other organizations also considered the physical exposure that contributes to vulnerability, noting that East Biloxi's low-lying area was at a higher risk of hurricane damage. Some government agency and FBO leaders acknowledge the individuality of vulnerability more readily than others. Leaders from agencies and organizations continue to explore the nuances or critique individual vulnerability.

3.3.4 FBO and Government Agency Leaders' perceptions of Recovery from Minor Tropical Cyclones

Interview participants from FBOs and government agencies framed recovery as either a community effort or an individual process. Community recovery emphasizes physical recovery, whereas individual recovery includes emotional elements. These two different perspectives of recovery show how, in a community-centered perspective, individual timelines and vulnerabilities are not fully considered. For an individual recovery perspective, no precise timeline for recovery is specified.

3.3.4.1 Government Agencies and FBOs Community Recovery Narratives after Minor Tropical Cyclones

The respondents who regarded recovery as a community process presented ways to measure when recovery had been met. One faith-based leader presented an idea for when recovery is complete as:

[When you're] back in decent housing, the job market is up, and unemployment is down. Kids are in school, and we're back to semi-recovered normality. Recovery is also natural: it includes the fishing industry (FBO16).

Other definitions of recovery focus more on the community's physical repairs to houses, lawns, and other property or physical features. Although Hurricane Zeta hit in

October 2020, during this study's interviews almost a full year later, several FBO leaders mentioned unfinished repairs, highlighting, "We're still seeing blue roofs," as a reference to ongoing construction work:

It depends on how much damage. We're still seeing blue [tarps on] roofs from Zeta. ...There was a lot of roof damage and people are still working because roofing companies just became overloaded (FBO14).

Another leader mentioned that it took six months to clean up the streets, while others still thought that recovery did not necessarily mean the completion of all physical repairs; rather, it was indicated by a return to normal activities. Some FBOs specified short-term and long-term recovery, stating that short-term recovery is the physical repairs but later did not fully explain the meaning of long-term recovery.

Other FBO leaders held community-based ideas of recovery that used diverse definitions of community. For example, one interviewee stated:

People help each other; it doesn't have to be a church, [but it can be] neighbors helping neighbors. That's how most communities recover from anything faster, [it's] when people in the community are willing to help each other out (FBO12).

One FBO leader started by discussing their congregation and then shared a broader sense of community:

...a couple of folks in the congregation are still waiting for roofs. We're talking about seven months out now. And most of them recovered, probably within two or three months, but the congregation... [is] insured and had resources from the community (FBO5).

Several interview participants from government agencies measured recovery in terms of cost and time. Government agencies will often report that full recovery has not yet been met to obtain more funding from the state or federal government. One organization explained the incentive for the local government of Biloxi not to declare themselves recovered:

... recovery could last for years. Because I'm going to keep that order in place if I can in order to avail myself of all of the resources the government is going to give me... [the] FEMA office for Katrina was open for seven years after the storm (GOV2).

Almost all government agencies measured recovery through metrics. Some examples are cost thresholds, time since a hurricane's impact, and what kind of government employees cover each component of hurricane recovery. Keeping those metrics in mind helps them get as much funding as possible. Seemingly in contrast, the following government leader first explained why people want recovery and are quick to declare themselves recovered:

They want businesses to come back quickly. They want families to be healed, and they want to have a vibrant community and a sense of place that everybody feels good about. And when you talk to communities, they are very quick to want to place that, like call it recovered right away (GOV4).

Government agencies' leaders indicated that they used these two contrasting approaches simultaneously: in other words, they do their best to help the community recover quickly while keeping their recovery paperwork and support lines open. Hence, they are still able to access any federal funds that have been delayed.

An exception to the general government leader approach to minor tropical cyclone recovery was GOV4, who critiqued the government agency language often used during tropical cyclone recovery.

We used the term, “bounce-back,” a lot instead of thinking about moving forward, or being better prepared, or better adapted, for future conditions (GOV4).

Interviewees explained that the term “bounce-back” pushed for a return to normalcy, even when things have changed that might never change back. Several FBOs concurred that the pressure to “bounce-back” to normal was unrealistic and explained how, for the above reason, that pressure is harmful. The same interviewee suggested that recovery happens when one community has the resources and capacity to help another. Yet even that measure of recovery can fall short because:

Some of them will offer things that they don't have; they'll overextend their programming to help each other... which was remarkable. But underneath, it's pretty apparent that some things are still broken (GOV4).

This last quote about recovery demonstrates how recovery is multi-layered. Just because a community or organization has extended its resources to others does not necessarily mean that they are recovered, stable, or that they have resources beyond what they need for themselves.

3.3.4.2 Government Agency and FBO Leaders' Individual Recovery Narratives: after Minor Tropical Cyclones

Several FBO leaders spoke about their personal recovery experiences and revealed that they did not feel they had recovered from Hurricane Katrina. They described a feeling of the unease of still living by the coast:

We have gotten better in many ways, and most of us have gone, ‘Oh well, it was just stuff’ ... When the weather conditions start building up again, you start feeling like, ‘Oh, no. I would never live by the water again; it changes your perspective (FBO6).

In this quote, and other personal narratives, recovery is beyond the replacement of physical items, recovery is also emotional wellbeing.

A few FBO leaders established the link between psychological and physical recovery among the people they serve. These faith-based leaders identified the cumulative toll of emotional or physical damage and the way that people can inadvertently slow their recovery:

Several people have not physically recovered from Zeta, which happened in October of last year... A tree fell on this man's house... He's almost facing PTSD-type effects from Katrina then [since] Zeta he can't seem to find the motivation to get his house fixed. So, he still has a giant hole in his roof, and the tarp keeps blowing off. Several others seem the same. They have the resources... [but they are] mental[ly] and physically exhausted (FBO14).

This quote exemplifies why people may not recover on community or externally created timelines.

Several faith-based leaders expressed frustration with the expectation that they would help people recover whom they perceive as not helping themselves. However, this sentiment was described in a couple of different tones. Some leaders thought people were too dependent on aid, while another FBO leader expressed the need to empower their community to help themselves. One interviewee actively working to empower the African American community explained the significance of pushing back on racial

stereotypes. FBO leaders with sentiments of self-sufficiency, on the other hand, indicated that individuals should take responsibility for their own recovery. Some felt that individuals were unnecessarily draining resources, while others wanted people to do what they could for themselves to save resources for the next storm recovery effort.

Interviewees noted that failure to fully fix or recover from physical damage can create a compounding effect. For instance, if people use their recovery funds on something else or can't prove that the damage is from the most recent tropical cyclone, they can be blocked from getting recovery funding. Then, many seek out FBOs as a last resort. One interviewee explained:

[If they] didn't get their roof fixed, the next hurricane is worse. One of the things you must prove to FEMA is the damage [on your home is not] from the last disaster...

[After] Zeta, people said 'I got my insurance money from Katrina, but I had to spend it on X, Y, and Z. Now my insurance won't cover me anymore.' FEMA is also not going to cover them... They're not playing with it for bad reasons. People do what they must do to survive (FBO9).

Interviewees also indicated that, even if people think they are using the recovery funding correctly, they can still put themselves in a tricky spot. The same FBO leader explained that people do not always have the knowledge needed to recover. They had to explain to people how to open a bank account after getting relief funding or how to allocate funds. One interviewee described an example of how a woman's decision-making put her in increasingly vulnerable positions:

[With over] \$10,000 from FEMA, she bought new appliances, painted the inside of her house, and replaced flooring, but she didn't get a roof done. And a roof needs to

be done. She said, 'I didn't know to start outside, top-down.' We don't know if there's going to be money to repair her roof. And now all that money she spent on the interior will be damaged (FBO9).

Just because people receive funds or aid does not mean that it will necessarily lead to their recovery or make them more adaptable for the next tropical storm.

3.4 Discussion

Literature on Gulf Coast disaster recovery does address the challenges and vulnerabilities of major tropical cyclones; however, current scholarship does not yet sufficiently show the grave and accumulative impacts that minor tropical cyclones can have on individuals. Government agency and FBO leaders interviewed unsettle the word “minor” in the context of minor tropical cyclones by explaining the ways that a minor tropical cyclone can still have a major impact on vulnerable people’s lives. Their descriptions of how a minor tropical cyclone can destabilize people, forcing them to choose between bad and worse situations, humanizes the individual circumstances of vulnerability. Minor tropical cyclones illustrate why it is essential to consider dimensions of vulnerability as intersectional and compounding. Yet not all assumed factors of vulnerability connect or compound in ways that are stereotyped, and poverty does not necessarily imply vulnerability.

In human geography literature, vulnerability has been analyzed through many indices and has been considered both through poverty and through physical exposure (Bohle, 1994; Cutter, 2008; Schlegelmilch, 2020; Shao et al., 2020). This human geography literature and the natural disaster literature highlights poverty as an important variable of vulnerability. The results of this paper found that the government and FBO

leaders interviewed were most likely to concur with Curtis and others (2007), who suggested that poverty cannot always be a measure of vulnerability. Conversely, Gault and others (2005) view poverty as an underlying component of all vulnerability. The current thesis presents a wide range of perspectives on and definitions of vulnerability specifically within the case study of Biloxi that expands beyond those viewpoints offered in the literature review (see Sections 1.4.1 and 3.1).

In Biloxi, minor tropical cyclones disproportionately affect housing: mobile homes and old houses have a higher chance of destruction in the wake of minor tropical cyclones (Taylor et al., 2010). Specifically, the concern of East Biloxi centers, in part, on old, coheired homes that present layers of issues when recovering from minor tropical cyclones. Furthermore, the increased physical exposure risk of East Biloxi, which has been discussed in the work by Shao and others (2020); Valk (2020), as well as this research, reinforce the need to better understand the multidimensional ways that risk and vulnerability compound each other.

In human geography literature, vulnerability has been analyzed through many indices and has been considered both through poverty and through physical exposure (Bohle, 1994; Cutter, 2008; Schlegelmilch, 2020; Shao et al., 2020). The natural disaster literature, from the Gulf Coast and Biloxi specifically, explores how people from minority identity groups are particularly vulnerable to minor tropical cyclones. The present research found that neither faith-based nor government leaders have a shared definition of vulnerability, which could create a challenge for assisting those disproportionately impacted by minor tropical cyclones. Vulnerability within East Biloxi was in conjunction with physical exposure, housing, and minority language barriers.

More broadly, the concept of vulnerability was approached from a few angles by FBO and government leaders. Some expressed vulnerability in sweeping statements like, “All Mississippians are vulnerable to a disaster,” (GOV1), while others articulated nuanced views regarding the uniqueness and individuality of vulnerability.

Vulnerability and recovery are deeply interconnected, both as concepts and in practice. Moreover, vulnerability can delay or act as a barrier to recovery. Recovery from minor tropical cyclones, like vulnerability, represents more than the ideas conveyed through a simple definition or metric and it is best examined more as a multifaceted process. When recovery is framed in metrics, particularly physical ones, it is easy to allow people and their needs to slip through the cracks and think that Biloxi has “bounced-back.” As one government leader suggested, however, communities cannot go back; the best they can do is build forward (GOV4). Government agencies simultaneously work toward quick recovery in communities while still presenting themselves as not yet recovered to state and federal agencies.

Community recovery is based on external metrics, like whether debris is picked up or whether people have their physical needs met. However, the complexity of individual recovery unsettles the concept of “bouncing-back” and shows the true psychological strength it takes to be in a place where tropical cyclones regularly occur. Like the term “vulnerability,” there are many definitions and understandings of what recovery is and how it is implemented. Individual cases show how many facets and types of vulnerability can impact people’s ability to recover.

3.5 Conclusion

Minor tropical cyclones, despite being categorized as minor, can cause serious disruption and destruction in Biloxi. Throughout the natural disaster literature and within the findings of this study, certain vulnerabilities have been considered as potentially increasing tropical cyclone risk and hardship during recovery. Key literature and the testimony of government personnel and FBO leaders demonstrate that the physical exposure of East Biloxi and wide-ranging individual circumstances were most closely connected to vulnerability. Recovery was also defined by government agencies and FBO leaders as either something that is determined by full community metrics, such as clearing debris from the streets, or by individual circumstances. Both findings of vulnerability and recovery reveal a tension between government agencies and FBOs with community or individual-oriented perspectives.

Further questions that remain unanswered in Biloxi are: how do people deemed vulnerable by government organizations and FBOs perceive themselves? How is vulnerability to and recovery from storms perceived differently when comparing the aftermath of a minor or major tropical cyclone? Finally, how is aid work implemented in Gulf Coast areas on the outskirts of major hurricanes that receive minor tropical cyclone level damage? (See Section 4.2.1) More comparative case studies might elucidate how FBOs and government agencies are perceived by Biloxi residents. Finally, the results of this paper suggest avenues for future research examining how recovery from a minor tropical cyclone contrasts or mirrors more broadly the ways that smaller-scale disasters are handled in small-to-medium-sized religious areas.

CHAPTER IV – CONCLUSION

4.1 Findings and Conclusions

This thesis considered the roles of government agencies and FBOs in minor tropical cyclone recovery within Biloxi, Mississippi. FBOs and government agencies have faced challenges and changing conditions when working to help Biloxi residents after minor tropical cyclones. Results from this research contribute to a growing understanding of natural disaster recovery on the Gulf Coast, introducing some of the ways in which minor tropical cyclones impact individuals on the Mississippi coast. This section reintroduces findings from Chapter 2 and 3, how they relate to the project's overall research questions, and the current paper's contribution to scholarship. Research on the recovery of communities and individuals from minor tropical cyclones contributes to the fields of human geography, natural disasters, and coastal governance. Future research directions are discussed in Section 4.2.

Chapter 2 responds to the first research question for this project: (Q1) How do FBOs and government agencies in Biloxi provide resources to vulnerable communities after minor tropical cyclones? The main finding for this first question was that aid provision and allocation is unstable after minor tropical cyclones. National funding is key to the availability of certain forms of resources and aid after a tropical cyclone, and this funding can be impeded or fail to come at all after a minor tropical cyclone. Local government agencies are unlikely to receive national funding following a minor tropical cyclone, and they can offer only limited aid as dictated by their protocols. In contrast, FBOs can provide resources that are often federally funded following major hurricanes. FBOs work to fill the gaps created by a dearth of federal government resources following

minor tropical cyclones, but their ability to do so is inconsistent. Many FBOs allocated resources first to their congregants before offering remaining resources to the wider community. These remaining resources were often insufficient to meet the needs of Biloxi residents.

To further understand resource provision and allocation, Chapter 2 also answered the third question: (Q3) How do FBOs and government agencies in Biloxi that provide resources to and/or engage with vulnerable communities interact with each other in the wake of minor tropical cyclones? The engagement of FBOs with vulnerable communities is important to consider after minor tropical cyclones given that national funds and aid is typically unavailable if storms are not categorized as “major” events. Most, if not all, support for Biloxi’s residents after minor tropical cyclones came from local government agencies and FBOs. Government agencies and FBO leaders’ descriptions of interactions with one another reinforced the concern that stable, reliable, and regular resources are not being offered after minor tropical cyclones. For instance, some FBO leaders reported being overwhelmed by referrals of aid-seekers from other FBOs, demonstrating a lack of adequate coordination and/or communication between FBOs regarding resource availability.

Unsustainable aid after minor tropical cyclones is particularly concerning because of the vulnerability of many Biloxi residents. Chapter 3 responds to the second research question: (Q2) How do FBOs and government agencies in Biloxi engage with vulnerable communities after minor tropical cyclones? The main finding was that vulnerability to and recovery from minor tropical cyclones is multifaceted. FBO and government agency leaders had many different definitions of vulnerability. Two key

themes emerged in the data: physical exposure risk to a community and an individual's identity as a member of a minority group. Recovery was also defined in one of two ways: through community metrics or individual well-being. This chapter demonstrated how minor tropical cyclones can have compounding impacts on Biloxi's residents.

The compounding and intersectional nature of the vulnerability is also why it is crucial to look at faith-based and government leaders' perceptions of vulnerability. Faith-based and government leaders' perceptions, as revealed through this study, present the tension between acknowledging the compounding nature of vulnerability and following the mentality of "rugged individualism" as presented by Hayden (2010) in this study's theoretical approach (Section 1.3.1). The current research compared how faith-based and government leaders perceive vulnerability, its relation to physical circumstances, and recovery. Most government agency leaders defined vulnerability in a general sense and did not fully address the compounding nature of vulnerability. Some faith-based leaders had more nuanced perspectives of vulnerability.

The findings from Chapters 2 and 3 contribute to the following two conclusions. The first is that resource availability and provision after a minor tropical cyclone is unreliable because of inadequate funding, resources, and local interaction between FBOs. Second, local government agency and FBO leaders' perceptions of vulnerability and recovery complicate aid work, which impacts the vulnerable people who struggle to recover from minor tropical cyclones.

4.2 Future Directions

This work has revealed additional questions and avenues for further research in these areas. Two potential research questions are presented below in Section 3.3.4.1, Section 3.3.4.2, and Section 3.3.4.3.

4.2.1 How is aid work implemented in Gulf Coast areas on the outskirts of major hurricanes that receive minor tropical cyclone level damage?

This thesis considers the impacts of minor tropical cyclones but does not differentiate between minor tropical cyclones and the peripheries of the impact zones of major hurricanes. A possible future direction for Gulf Coast research lies in considering how the areas outside of the direct impact of major hurricanes are treated when enacting local and national recovery aid. As stated in Chapter One, past research found that most resources from the federal government following Hurricane Katrina were directed to New Orleans because it was deemed a greater emergency (Hayden, 2010; Cutter et al., 2014; Lowe, 2012). This is an example of national aid and attention going to a place where the impacts of a major hurricane were deemed most catastrophic while other impacted areas may have been neglected. This avenue for future research could encompass the gradation of funding resources across space in conjunction with the category of a tropical cyclone.

4.2.2 What is the cumulative impact of tropical cyclones on FBOs' funding and aid work?

This thesis reveals that minor tropical cyclones can create a strain for FBOs, but it does not consider the long-term implications of providing aid over multiple disasters. Additional research into funding for tropical cyclone recovery could be conducted via a longitudinal analysis. In the literature, major hurricanes have challenged the capacities of

FBO resources. A future study could consider the toll on FBOs from extending themselves after tropical cyclones when recovery is not fully supported by national, state, and local government agencies funding and resources.

4.2.3 Other questions from Chapters 2 and 3: concluding thoughts

Questions for future research could consider the positionality and perspectives of vulnerable people. The following two questions examine resource provision from the perspective of vulnerable people and their conceptualization of their own vulnerability. How well-received and helpful are the resources available to the vulnerable people receiving them? How do people deemed vulnerable by government organizations and FBOs perceive themselves? To understand the role of aid, future research could address the complexities of resources and vulnerability. From the vantage point of vulnerable people receiving resources, research could expand on the ease of access to aid, effectiveness of aid, and which FBOs or government agencies vulnerable people contact.

Other questions from the end of chapter 2 and 3 present the opportunity for further comparison between FBOs and government agencies: How do the roles of FBOs and government agencies differ in response to minor vs. major tropical cyclones? How is vulnerability to and recovery from storms perceived differently when FBOs and government agencies compare the aftermath of a minor and major tropical cyclones? This thesis considered the differences between the roles of FBOs and government agencies; however, it centered around minor tropical cyclones. Further research could explore the gap between funding and resources provided after major and minor tropical cyclones, as revealed by the findings of this thesis.

Further, findings for this thesis reveal the importance of FBOs to recovery in Biloxi and could inform other recovery research in religious areas. The complexities of resource provision and distribution, along with organizational and agency interactions, demonstrate the value in researching what is offered and also considering how resources are offered in disaster recovery. Finally, this thesis addresses the understudied impacts of minor tropical cyclones. Minor tropical cyclones can gravely impact people's lives; this adds to the fields of Human Geography, Disaster Recovery, and Political Ecology by showing the value of studying what might initially seem like a small natural disaster or environmental hazard. Other areas of research, especially ones that have predominantly focused on major disasters, could use this thesis to help consider the value of research on minor disasters and understand the human dimensions and implications learned by studying minor tropical cyclones.

APPENDIX A – IRB Approval Letter

Office of
Research Integrity



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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-21-98

PROJECT TITLE: How Faith-based and Government Organization aid Vulnerable People in wake of Minor Hurricanes

SCHOOL/PROGRAM: Coastal Sciences

RESEARCHER(S): Camilla Witherspoon, Leslie Acton

IRB COMMITTEE ACTION: Approved

CATEGORY: Expedited

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: May 27, 2021

A handwritten signature in cursive script that reads "Donald Sacco".

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

REFERENCES

- Andrew, S. A., Bacot, H., & Craw, M. (2020). A Multiorganizational Cooperation Framework for Neighborhood Disaster Resilience. *State and Local Government Review*, 52(1), 53-66.
- Anthony, K. E., & Sellnow, T. L. (2011). Information acquisition, perception, preference, and convergence by Gulf Coast residents in the aftermath of the Hurricane Katrina crisis. *Argumentation and Advocacy*, 48(2), 81-96.
- Bankston III, C. L., & Zhou, M. (2020). Involuntary migration, context of reception, and social mobility: The case of Vietnamese refugee resettlement in the United States. *Journal of Ethnic and Migration Studies*, 1-20.
- Berg, R. & Reinhart, B. (2021, April 14). National Hurricane Center Tropical Cyclone Report. National Oceanic and Atmospheric Administration.
https://www.nhc.noaa.gov/data/tcr/AL192020_Sally.pdf
- Bergstrand, K., & Mayer, B. (2020). "The Community Helped Me:" Community Cohesion and Environmental Concerns in Personal Assessments of Post-Disaster Recovery. *Society & natural resources*, 33(3), 386-405.
- Bernard, H. R., Wutich, A., & Ryan, G. W. (2016). Analyzing qualitative data: Systematic approaches. SAGE publications.
- Bohle, Hans G., Thomas E. Downing, and Michael J. Watts. "Climate change and social vulnerability: toward a sociology and geography of food insecurity." *Global environmental change* 4.1 (1994): 37-48.

- Bjarnadottir, S., Li, Y., & Stewart, M. G. (2011). A social vulnerability index for coastal communities at risk to hurricane hazard and a changing climate. *Natural Hazards*, 59(2), 1055-1075.
- Brown, S., Goldsmith, C., Halperin, L., Winarksi, K., & Vedlitz, A. (2020) *Role of Coastal Bend Organizational Stakeholders in Regional Recovery and Resilience Efforts*.
- Cain, D. S., & Barthelemy, J. (2008). Tangible and spiritual relief after the storm: The religious community responds to Katrina. *Journal of Social Service Research*, 34(3), 29-42.
- Cain, D. S., & Barthelemy, J. J. (2015). The New Orleans Religious Community Rebuilds After Hurricane Katrina. *Race, Gender & Class*, 184.
- Cannon, C., Gotham, K. F., Lauve-Moon, K., & Powers, B. (2020). The climate change double whammy: Flood damage and the determinants of flood insurance coverage, the case of post-Katrina New Orleans. *Climate Risk Management*, 27, 100210.
- Clay, L. A., & Ross, A. D. (2020). Factors associated with food insecurity following Hurricane Harvey in Texas. *International journal of environmental research and public health*, 17(3), 762.
- Curtis, A., Mills, J. W., & Leitner, M. (2007). Katrina and vulnerability: the geography of stress. *Journal of health care for the poor and underserved*, 18(2), 315-330.
- Cutter, S. L., Emrich, C. T., Mitchell, J. T., Piegorisch, W. W., Smith, M. M., & Weber, L. (2014). Hurricane Katrina and the forgotten coast of Mississippi. *Cambridge University Press*.

- Cutter, S. L., Emrich, C. T., Mitchell, J. T., Boruff, B. J., Gall, M., Schmidtlein, M. C., ... & Melton, G. (2006). The long road home: Race, class, and recovery from Hurricane Katrina. *Environment: Science and Policy for Sustainable Development*, 48(2), 8-20.
- Cutter, Susan L., et al. "A place-based model for understanding community resilience to natural disasters." *Global environmental change* 18.4 (2008): 598-606.
- De Vita, J., & Kramer, F. D. (2008). The Role of Faith-Based and Community Organizations in Providing Relief and Recovery Services after Hurricanes Katrina and Rita. *APSE Research Brief*.
- Dunning, K. H. (2020). Building resilience to natural hazards through coastal governance: a case study of Hurricane Harvey recovery in Gulf of Mexico communities. *Ecological Economics*, 176, 106759.
- Dzwonkowski, B., Fournier, S., Lockridge, G., Coogan, J., Liu, Z., & Park, K. (2021). Cascading weather events amplify the coastal thermal conditions prior to the shelf transit of Hurricane Sally (2020). *Journal of Geophysical Research: Oceans*, 126(12), e2021JC017957.
- Elliott, J. R., & Pais, J. (2006). Race, class, and Hurricane Katrina: Social differences in human responses to disaster. *Social science research*, 35(2), 295-321.
- Federal Emergency Management Agency. (2021). *2020 Declared Disasters Archive*. Retrieved December 15, 2021, from <https://www.fema.gov/disaster/declarations>
- Fitzpatrick, K. M., Willis, D. E., Spialek, M. L., & English, E. (2020). Food Insecurity in the Post-Hurricane Harvey Setting: Risks and Resources in the Midst of Uncertainty. *International Journal of Environmental Research and Public Health*, 17(22), 8424.

- Flores, A. B., Collins, T. W., Grineski, S. E., Griego, A. L., Mullen, C., Nadybal, S. M., ... & Trego, S. A. (2020). *Environmental Injustice in the Disaster Cycle: Hurricane Harvey and the Texas Gulf Coast*.
- Gabe, T., Falk, E. H., Mason, V. W., & McCarty, M. (2005). Hurricane Katrina: Social-demographic characteristics of impacted areas. *Washington, DC: Congressional Research Service, Library of Congress*.
- Gault, B., Hartmann, H., Jones-DeWeever, A., Werschkul, M., & Williams, E. (2005). The women of New Orleans and the Gulf Coast: Multiple disadvantages and key assets for recovery: Part I. Poverty, race, gender and class. Institute for Woman's Policy Research. <https://iwpr.org/wp-content/uploads/2020/11/D464.pdf>
- Gheyntanchi, A., Joseph, L., Gierlach, E., Kimpara, S., Housley, J., Franco, Z. E., & Beutler, L. E. (2007). The dirty dozen: Twelve failures of the Hurricane Katrina response and how psychology can help. *American Psychologist*, 62(2), 118.
- Graif, C. (2016). (Un) natural disaster: vulnerability, long-distance displacement, and the extended geography of neighborhood distress and attainment after Katrina. *Population and Environment*, 37(3), 288-318.
- Green, J. J., Kleiner, A. M., & Montgomery, J. P. (2007). The texture of local disaster response: Service providers' views following Hurricane Katrina. *Journal of Rural Social Sciences*, 22(2), 3.
- Green, J. J., Gill, D. A., & Kleiner, A. M. (2006). From vulnerability to resiliency: Assessing impacts and responses to disaster. *Journal of Rural Social Sciences*, 21(2), 6.

- Griego, A. L., Flores, A. B., Collins, T. W., & Grineski, S. E. (2020). Social vulnerability, disaster assistance, and recovery: A population-based study of Hurricane Harvey in Greater Houston, Texas. *International Journal of Disaster Risk Reduction*, 51, 101766.
- Hayden, B. (2010). The hand of God: Capitalism, inequality, and moral geographies in Mississippi after Hurricane Katrina. *Anthropological quarterly*, 177-203.
- Hutton, N. S., Mumford, S. W., Saitgalina, M., Yusuf, J. E., Behr, J. G., Diaz, R., & Kiefer, J. J. (2021). Nonprofit capacity to manage hurricane-pandemic threat: Local and national perspectives on resilience during COVID-19. *International Journal of Public Administration*, 44(11-12), 984-993.
- Jerch, R., Kahn, M. E., & Lin, G. C. (2020). Local Public Finance Dynamics and Hurricane Shocks (No. w28050). *National Bureau of Economic Research*.
- Lauria, M. (2015). Markets of sorrow, labors of faith: New Orleans in the wake of Katrina, by Vincanne Adams. *Urban Geography*. 36(3), 467-470.
- Leavell, K., Aten, J. D., & Boan, D. (2012). The lived coping experiences of South Mississippi and New Orleans clergy affected by Hurricane Katrina: An exploratory study. *Journal of Psychology and Theology*, 40(4), 336-348.
- Liu, W. (2020). Disaster communication ecology in multiethnic communities: Understanding disaster coping and community resilience from a communication resource approach. *Journal of International and Intercultural Communication*, 15(1), 1-24.
- Lowe, J. S. (2012). Policy versus politics: Post-Hurricane Katrina lower-income housing restoration in Mississippi. *Housing Policy Debate*, 22(1), 57-73.

- Malhotra, N., & Kuo, A. G. (2008). Attributing blame: The public's response to Hurricane Katrina. *The Journal of Politics*, 70(1), 120-135.
- Marasco, D., Murray-Tuite, P., Guikema, S., & Logan, T. (2020). Time to leave: an analysis of travel times during the approach and landfall of Hurricane Irma. *Natural Hazards*, 103(2), 2459-2487.
- Mayfield-Johnson, S., Fastring, D., Le, D., & Nguyen, J. (2020). Addressing the social vulnerability of Mississippi Gulf Coast Vietnamese community through the development of community health advisors. *Sustainability*, 12(9), 3892.
- McGinnis, M. D. (2011). Religion policy and faith-based organizations: Charting the shifting boundaries between church and state. *In Annual Meeting of ASREC, the Association for the Study of Religion, Economics and Culture, Washington, DC.*
- Merriam, S. B., & Tisdell, E. J. (2015). Qualitative research: A guide to design and implementation. *John Wiley & Sons.*
- Messias, D. K. H., & Lacy, E. C. (2007). Katrina-related health concerns of Latino survivors and evacuees. *Journal of health care for the poor and underserved*, 18(2), 443-464.
- Morse, R. (2008). Environmental justice through the eye of Hurricane Katrina (pp. 7-9). Washington, DC: *Joint Center for Political and Economic Studies, Health Policy Institute.*
- Muñiz, B. (2006). In the eye of the storm: how the government and private response to Hurricane Katrina failed Latinos. *National Council of La Raza.*

- National Oceanic and Atmospheric Administration. (2021). *2020 Tropical Cyclone Advisory Archive*. Retrieved December 15, 2021, from <https://www.nhc.noaa.gov/archive/2020/>
- Pathak, A., Zhang, L., & Ganapati, N. E. (2020, November). Understanding Multi-Sector Stakeholder Value Dynamics in Hurricane Michael to Facilitate Collaborative Decision Making in Disaster Contexts. In *Construction Research Congress 2020: Infrastructure Systems and Sustainability* (pp. 249-258). Reston, VA: American Society of Civil Engineers.
- Phillips, C. A., Caldas, A., Cleetus, R., Dahl, K. A., Declet-Barreto, J., Licker, R., ... & Carlson, C. J. (2020). Compound climate risks in the COVID-19 pandemic. *Nature Climate Change*, 10(7), 586-588.
- Powell, R., & Gilbert, S. (2006). The Impact of Hurricanes Katrina and Rita on People with Disabilities: A Look Back and Remaining Challenges. *National Council on Disability*.
- Price, A., Cochran Jr, D. M., Raber, G., & Hill, J. (2020). Evaluating Exposure to Coastal Hazards in the Supervised Offender Population Using Social Disorganization Theory. *Southeastern Geographer*, 60(3), 215-234.
- Race and ethnicity in East Biloxi, Biloxi, Mississippi (neighborhood). The Demographic Statistical Atlas of the United States - Statistical Atlas. (2018). Retrieved January 27, 2022, from <https://statisticalatlas.com/neighborhood/Mississippi/Biloxi/East-Biloxi/Race-and-Ethnicity>
- Rawls, C. G., & Turnquist, M. A. (2010). Pre-positioning of emergency supplies for disaster response. *Transportation research part B: Methodological*, 44(4), 521-534.

- Religion in America: U.S. religious data, Demographics and statistics. Pew Research Center's Religion & Public Life Project. (2020, September 9). Retrieved December 15, 2021, from <https://www.pewforum.org/religious-landscape-study/state/mississippi/>
- Schlegelmilch, Jeffrey, et al. "A philanthropic approach to supporting emergent disaster response and recovery." *Disaster medicine and public health preparedness* 14.1 (2020): 158-160.
- Shao, W., Jackson, N. P., Ha, H., & Winemiller, T. (2020). Assessing community vulnerability to floods and hurricanes along the Gulf Coast of the United States. *Disasters*, 44(3), 518-547.
- Sherman, A., & Trisi, D. (2015). Safety net more effective against poverty than previously thought. *Center on Budget and Policy Priorities*.
- Shinn, J. E., & Caretta, M. A. (2020). "If it Wasn't for the Faith-based Groups, We Wouldn't Be Where We Are Today": Flooding Response and Recovery in Greenbrier County, WV. *Southeastern Geographer*, 60(3), 235-253.
- Shultz, J. M., Kossin, J. P., Hertelendy, A., Burkle, F., Fugate, C., Sherman, R., ... & Galea, S. (2020). Mitigating the twin threats of climate-driven Atlantic hurricanes and COVID-19 transmission. *Disaster medicine and public health preparedness*, 1-10.
- Sobel, R. S., & Leeson, P. T. (2006). Government's response to Hurricane Katrina: A public choice analysis. *Public Choice*, 127(1), 55-73.
- Spielman, S. E., Tuccillo, J., Folch, D. C., Schweikert, A., Davies, R., Wood, N., & Tate, E. (2020). Evaluating social vulnerability indicators: criteria and their application to the Social Vulnerability Index. *Natural Hazards*, 100(1), 417-436.

- Stuart, T. D., McMillon, G. M., & Chandler, R. S. (2010). Faith Communities, FCS, and Natural Disasters: Expanding the Helping Network. *Journal of Family & Consumer Sciences*, 102(3).
- Symonette, Erika. (2018) "Disaster Preparedness: Developing Sustainable Communities for Older Adults and Other Vulnerable Populations." *Sustainable Communities Review*.
- Taylor, H. T., Ward, B., Willis, M., & Zaleski, W. (2010). The saffir-simpson hurricane wind scale. *Atmospheric Administration: Washington, DC, USA*.
- Tierney, K. J. (2007). From the margins to the mainstream? Disaster research at the crossroads. *Annu. Rev. Sociol.*, 33, 503-525.
- Truitt, A. J. (2021). *Pure Land in the Making: Vietnamese Buddhism in the US Gulf South*. University of Washington Press.
- United States Census Bureau. (2020). *Explore census data*. Retrieved March 23, 2022, from <https://data.census.gov/cedsci/profile?g=0400000US28>
- Valk, K. (2020) *Climate Adaptation Efforts of Coastal Cities in the Southeast United States*. A *Climate Institution Publication*.
- Williams, D. A., & Jacobs, F. (2021). Landscapes of Trust: An Investigation of Posthurricane Engagement and Recovery. *Environmental Justice*, 14(3), 188-197.
- Wilson, B. (2018). East Biloxi: Bayou Restoration as Environmental Justice. In *Resilience for All* (pp. 29-58). *Island Press, Washington, DC*.