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DISASTER PREPAREDNESS IN THE AMERICAN ACADEMY: A STUDY OF INSTITUTIONAL CONTEXT FACTORS FOR COMPLIANCE WITH THE NATIONAL INCIDENT MANAGEMENT SYSTEM

A dissertation
Presented to
The College of Graduate and Professional Studies
Department of Educational Leadership and Foundations
Indiana State University
Terre Haute, Indiana

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

by
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March 2012
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Keywords: Disaster, Preparation, Preparedness, University, College
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ABSTRACT

Recent major disaster events at colleges and universities around the nation have demonstrated that change is needed in the way that higher education institutions (HEIs) approach disaster preparation. The comforting notion that HEIs are immune to natural and manmade hazards has been shattered by events such as the Virginia Tech massacre and Hurricane Katrina’s assault on Mississippi’s coastal campuses. Reports of many other institutional responses to a variety of disaster incidents demonstrate that these two major disasters are not isolated events on the campuses of the American academy.

This study developed a snapshot view of disaster preparation in American HEIs, using National Incident Management System (NIMS) compliance as a proxy for disaster preparedness. This quantitative, retrospective study, with a non-experimental design, used a scientific approach that employed both archival and survey data from a stratified random sample of 108 HEIs that were categorized based on organization and governance, as well as institutional sector, to establish a benchmark measurement of disaster preparation in the various types of institutions. Further, the study examined institutional context factors to investigate the degree of NIMS compliance in place at American HEIs, including organization and governance, previous disaster experience, institutional size, legal representation on the planning and response team, institutional sector, and composite economic losses by state, to see if any of these factors was statistically associated with NIMS compliance.
Results indicate that two of the study variables were statistically significant; institutional size and institutional sector. These findings expose that smaller institutions are lagging behind in disaster preparedness. Additionally, the outcomes reveal that private institutions are facing difficulty keeping pace with their public counterparts in disaster preparation.
ACKNOWLEDGMENTS

The first and foremost acknowledgement is made to the good Lord for blessing me with the health, desire, and capacity necessary to accomplish this task.

To all of you who have helped with the foundational aspects of this dissertation: Donnie Smith, State of Tennessee NIMS Coordinator; Rick Bodane, State of Georgia NIMS Coordinator; Tara Hill, U. S. Department of Education; Rupert Dennis, the U. S. Department of Homeland Security Region IV NIMS Coordinator; Ron Purvis, State of Mississippi NIMS Coordinator; and to Greg Southworth, Southworth Consultants, former Assistant Vice President of EHS and Emergency Management at Tulane University, who planted the idea for this dissertation; thank you to each of you for your help.

To all of the study participants, thank you for your help and insights, without which this study could not have happened.

To Dr. Eric Hampton, thank you for your feedback and guidance during our discussions on my research methods and the interpretation of the results.

To Dr. Brad Balch, thank you for your thoughtful and genuine care in reading my work and advising my progress through a sincere and intellectual presence on the committee.

To Dr. Hans Chun, thank you for your counsel prior to joining the committee, and for your diligence and keen insight as a committee member.

To my dissertation Chair, Dr. Josh Powers: every once in a while a teacher comes along who has the ability to help a student to discover personal potential for growth previously
unknown by that student. Thank you for being one of those teachers, and for helping me to make some of those discoveries.

Special thanks are in order to my parents, Donald and Helena Wilder, and my parents-in-law, Mervin and Marie Hall, for their continual encouragement and support.

And most importantly to my wife, Elizabeth, my main advisor/proof-reader/friend, and to our sons, James and John, all who weathered the storm with me, through the incredibly difficult circumstances of Hurricane Katrina and family health issues; you are due untold thanks for your prayers, patience, encouragement, and sacrifices.
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PROLOGUE

Gulfport, Mississippi, September 5, 2005, 2:18 p.m. The man carried what appeared to
be a standard issue assault weapon. He wore a sidearm, too. Yet, his grim expression conveyed
more seriousness even than his weaponry. He was dressed in camouflage with a dark colored
beret. Nevertheless, the uniform’s pattern, meant to conceal him in a jungle environment, made
him stand out like a sore thumb in the urban jungle of twisted debris left behind in the storm’s
aftermath. I could see this as I approached the checkpoint. Three or four similarly armed
soldiers flanked him. They stood near several military vehicles arranged in defense of an attack.

As he waved me down, I could not help but feel like I was an intruder in my own
neighborhood. I rolled down the driver’s side window as he asked, “May I help you?” I was
about to tell him where I was going, when I heard the steady beat from a rapidly approaching
pair of helicopter gun-ships, many of which were patrolling the area in tandem formation. The
constant and intensifying thwop! thwop! thwop! pounding from their rotor blades increased in
volume, making communication impossible until their eventual retreat down the coastline. Yet,
once the helicopters retreated, it was quiet, alarmingly quiet: no dogs barking, no birds singing,
no neighbors mowing lawns, and no children laughing, not even the buzz of flying insects. They
did not return until the second week.

The checkpoint was set up at the railroad track that runs east-west along the coast, and
separates Hurricane Katrina’s ground-zero area from the less damaged parts of the Mississippi
Gulf Coast. Those items that demonstrate human habitation south of the tracks were completely
devastated, leaving only fractured remnants of a once peaceful existence, like those pictures of the damage from a nuclear explosion. It appeared that the storm had almost wiped the ground clean of structures in most areas. It seemed that the whole city was crumbling.

Multiple coils of razor wire now lined the north side of the tracks for miles in both directions, placed there to ward off potential looters and disaster sightseers, the criminal and the curious, as well as legitimate entrants. The coils of the shiny, sharp wire separated in a small area just ahead, enough to allow single-file approved vehicular traffic to pass. The razor wire barricade was probably crossable on foot between checkpoints, but the ditch running along the south side of the tracks contained water and piles of debris that were blown and washed up by the storm. There was also the potential danger that the ditch contained snakes: cottonmouths, rattlesnakes, and water moccasins displaced by the storm. The elevated railroad bed made a natural stopping point for the debris field, a natural demarcation line that the storm seemed to have accepted as well.

It was a week to the day after Hurricane Katrina, and the search for survivors had deteriorated into a search for remains. Cadaver dogs yelped frantically down my street, as the white-garbed crews performed their sorrowful, but necessary, duties. One of the things the television coverage did not portray was the sense, and variety, of the odors. The stench from garbage, seaweed, displaced saltwater, sewage, decay and rot all mixed in the sweltering heat of the 85-degree days to overpower one’s sense of smell.

My mind drifted to the college, the University of Southern Mississippi’s Gulf Coast campus, which was south of the tracks facing the water of the Gulf, with only a small strip of asphalt separating it from the sand of the beach. The damage was extensive. Katrina had not been kind to the institutions of higher education on the Gulf Coast. She left most of them in
shambles, with little hope of resuming operation in their physical plants, some potentially for
years, and others likely never.

I was jolted out of my mental wanderings about the school by the abrupt follow-up
remark from the military man, “I’m sorry, but the only access to the area is by emergency
vehicles, rescue teams, utility support, and official traffic.” “But it has been a week to the day
since the storm and I have not been back in since she hit. I need to check on my things,” I
counterered. “I’m sorry, but the police department closed the area until further notice,” he shot
back.

I had been turned away. I had lost everything that was in my office from before I had
started as a professor. Textbooks from my bachelor’s degree, master’s degree, and doctoral
degree programs – all were gone. All the reprints from my research articles, all the journals, all
the papers in progress, all the text and reference books, all the files, all the computer hardware
and disks, all samples of student work for accreditation were gone. It did not matter that there
were backup copies. The copies were gone, too. The library was gone. The Education
Department, the Engineering Department, the English Department, it made no difference. Items
of particular importance, transferred for safekeeping to my home (which had survived Hurricane
Camille in 1969, and numerous hurricanes over its 65-year existence), were gone along with the
house itself. Diplomas and awards were gone, as was the first watercolor my son had done for
me. Professional photographs of my family, and clay paperweights from my children–all were
gone. It was all gone!
CHAPTER 1

INTRODUCTION

Major disasters and emergencies happen everywhere and anywhere, as demonstrated across the Mississippi Gulf Coast during Hurricane Katrina. Institutions of higher education are not immune from catastrophic occurrences of natural and/or man made variations. “The devastation that Hurricane Katrina inflicted on the universities of [the Gulf South] in late August 2005 [was] undoubtedly the most serious disruption of American higher education in the nation's history” (O'Neil, Cook, Finkin, Henry, & et al., 2007, p. 1). Physical and economic losses to colleges and universities from Hurricane Katrina alone totaled an estimated $2.5 billion (International Association of Campus Law Enforcement Administrators, 2006). While Jenkins (2008) agreed that it was the most devastating higher education disruption, he noted that it was not the first crisis disruption in the academy.

Disaster in the Academy

There were other high profile disaster occurrences in American academe. Brief descriptions of three examples follow, including the earthquake that devastated California State University at Northridge in 1994, the tornado that thrashed Minnesota’s Gustavus Adolphus College in 1998, and the shootings that occurred on the campus of Virginia Tech in 2007. However, this is not a comprehensive list.
California State University Northridge Earthquake

On the morning of January 17, 1994, a magnitude 6.7 earthquake jolted the greater Los Angeles area awake. The 4:31 a.m. quake’s epicenter was little more than a mile from California State University’s Northridge campus, on a previously unknown fault. Every one of the institution’s buildings suffered damage resulting from the vibration forces of the quake, some to the point of being irreparable (Finlay, 1999). Consequently, damage to the institution “was the worst to occur on any major university campus in the history of the United States” (Gunther & Johnson, 2001, p. 662). The damage total for the institution exceeded $400 million, and it took years to rebuild (Finlay, 1999).

The damage ranged from equipment and supplies crashing to the floor and broken water lines flooding buildings, to severe structural and fire damage to the science complex and the total collapse of a new 14 million dollar parking garage designed to withstand earthquakes (McCurdy, 1994). Nearly a dozen of the state’s community colleges in the area “suffered losses” during the same disaster event, some being “hit hard” with “roofs ripped apart so badly that the sun could be seen from inside each of the buildings,” (McCurdy, 1994, p. A21). The quake lasted only a few minutes, but the repair of damage to the campus and collegiate community took years.

Gustavus Adolphus College Tornado Impact Event

On the afternoon of March 29, 1998, a series of thunderstorms ominously rolled across south and central Minnesota, spawning 14 tornados. It became the largest, early season outbreak of severe weather in the state’s history (T. Krause, personal communication, November 19, 2008). At about 5:20 p.m., the eighth of the tornados, an F3 on the Fujita scale, struck the small town of St. Peter, Minnesota. Gustavus Adolphus College was in the direct path of that one and
one-half mile-wide tornado. The vortex winds exceeded 200 miles per hour as the storm roared through the campus (Ackil, Van Abbema, & Bauer, 2003).

The damage to the institution was immense. Most of the college’s buildings sustained damage, some beyond repair. Over 2,000 trees were lost at the institution. Some 80% of the windows on campus were shattered, with the total damage estimates exceeding $50 million (R. Thrower, personal communication, February 9, 2009). One estimate suggests that, until Hurricane Katrina happened, the damage to Gustavus Adolphus College was the worst weather-related damage to an institution of higher education in American history (S. Waldhauser, personal communication, February 9, 2009). Although the campus reopened in temporary buildings within three weeks of the event, over a decade later it still showed evidence of the storm with some temporary buildings remaining in use.

**Virginia Tech Active Shooter**

Shortly after 7:00 a.m. on April 16, 2007, a disturbed and unstable student at the Blacksburg campus of Virginia Polytechnic Institute and State University (commonly called Virginia Tech) began a terror spree that would forever change the academic community. He began by shooting and killing two fellow students in a campus dormitory. Returning to his room at another dorm to change out of his bloodstained clothes, he went out again armed with two semi-automatic pistols and approximately 400 rounds of ammunition (Davies, 2008). The student went to the Blacksburg Post Office and mailed a packet containing a letter, photographs of himself with weaponry, and a video of himself reading the letter. Coincidently, while at the post office, “he was recognized by a professor who thought he looked frightening” (Massengill et al., 2007, p. 85). Upon leaving at 9:01 a.m., based on his postal receipt, he returned to the campus (Massengill et al., 2007).
Back on campus, he proceeded to the Engineering Building. At approximately 9:30 a.m., during the second period morning class, he chained the doors shut at the three main entrances to the building. He ascended the stairs to the second floor and walked around peering into several classrooms. At 9:40 a.m., he entered one of the rooms, shot the professor to death, and opened fire on the students (Massengill et al., 2007). Next, he went from classroom to classroom firing his weapons, often from point-blank range, at both professors and students.

The shooting rampage ensued for the next 11-12 minutes, during which time several students with cell phones notified authorities of the incident. The police arrived within a few minutes, and sequentially tried to gain access to the building through all three of the chained entrances, attempting to shoot off the padlocks securing the chains. Unable to make entry into the building through the main entrances, they found and forced their way in through a locked maintenance shop door, which remained unchained, by shooting through the standard lock with a shotgun (Massengill et al., 2007).

Officials investigating the incident suspect that the loud report from the shotgun blast announced the police force arrival to the shooter. As the police ascended the stairs and accessed the second floor of the building, the gunman discharged his last fired round of ammunition into his own skull, ending his life. By the time the shooting ended, the gunman had fired 174 rounds from two handguns, taken the lives of 33 people, and wounded 17 more. Six students sustained injury during their escape through second story windows (Massengill et al., 2007). Although the last shot ended the shooting spree, it did not end the incident. Rather, it began a long period of recovery that ultimately changed not only the individuals and families involved, but also the institution and the academic community at large.
Alert for Higher Education Institutions

These examples illustrate the nature of potential disaster waiting for the American academy. For many of the approximately 4,000 institutions of higher education in this country, such horrendous experiences may seem a remote possibility. Yet, data on emergency management situations, in which people’s lives were lost or at serious risk and/or property damaged or completely destroyed, is much greater than might be commonly believed.

Researchers have warned of the increase in crises for years. Quarantelli (1991a) suggested that the frequency and severity of disasters would increase with time, due to both the increase in disaster agents and the changes in social trends leading to an increase in risk and vulnerability. Shrivastava, Mitroff, Miller, and Miglani (1988) suggested that there is an increase in the frequency of incidents. Robert and Lajtha (2002) noted that, in general, the frequency of crises are trending upward, to the point that, “[t]hey have become almost the daily lot” (p. 181). Both Perry (2007) and Blanchard (2008) stated that the frequency of natural disasters is increasing. In fact, Mitroff (2005) indicated that crisis management situations across the board, based on normal, abnormal, and natural accidents, have steadily increased over the last 25 years. Natural accidents are just that: accidents caused on natural hazards such as flood, tornado, fire, earthquake, and similar incidents. Normal accidents, according to Perrow (1984), are failures of a complex system due to intrinsic convolution, resulting in unintentional consequences. Mitroff (2005) suggests that, due to the complexity of technology, “the potential for large-scale… catastrophes is literally built into [the] basic design and everyday operations” of organizations (p. 9).

Mitroff (2005) explained the abnormal category of accidents as caused by intentional acts of evil, which are determined to disrupt complex technical, organizational, and social systems.
Historically, abnormal accidents were infrequent, but not unusual. However, Mitroff’s analysis showed that, over the 10-year period from 1995 to 2005, the frequency of abnormal accidents is the same as normal accidents, suggesting a sharp rise in their occurrence, and, more importantly, a sharp rise in the frequency of accidents/disasters overall.

In light of the above work, questions arise about college and university preparedness for minimizing the chances of an accident/disaster, and for adequate response to a disaster, when it occurs. Are plans and processes in place to protect students? Do institutions have provisions to preserve vital material resources such as student records, cutting-edge research, or collegiate heirlooms?

The preparation that administrative leaders guide a campus through for a major disaster may determine how the campus community copes with the disaster aftermath, or even if it will be capable of resuming functions, in part or in full, within a reasonable period. This is of paramount importance, because “every organization is virtually guaranteed to experience at least one major crisis in its history” (Mitroff, 2005, p. 8).

**Statement of the Problem**

To date, the research on disaster preparedness has been limited to, and largely focused on, case studies of specific disaster aftermath experiences (Aschenbrener, 2001; Johnson, 2007; Wilson, 1992). Furthermore, there is no clear understanding of what is needed for institutional preparedness for possible disasters/emergencies (Mitroff, Diamond, & Alpaslan, 2006). What has been written about disasters and their aftermath in higher education suggests a need to formalize the process of preparation in order to provide an understanding of how best to inform practice. Once the preparation process is understood, there is a specific necessity to use this
improved information to advance institutional disaster/emergency response, while concurrently minimizing disaster/emergency impact on institutional constituencies.

Underlying the deficiency in awareness and understanding of the state of preparedness in the American academy is the lack of standardization in what preparedness means. To rectify this issue, and to bolster the emergency management discipline by providing for interoperability and compatibility between federal, state, local, and tribal actions in emergency incidents, the federal government has embarked on the lengthy process of developing preparedness guidelines for a nationally consistent response to a wide range of hazards that could occur. President George W. Bush initiated the process to achieve this through Homeland Security Presidential Directive Five (HSPD-5) on February 28, 2003 (Bush, 2003). HSPD-5 directed the Secretary of the Department of Homeland Security (DHS) to implement the National Incident Management System (NIMS).

NIMS provides a core set of concepts, principles, and terminology developed into a set of guidelines based on the National Fire Protection Agency’s (NFPA) Disaster/Emergency Management and Business Continuity Programs standard. This standard began as the Recommended Practice for Emergency Management, after the NFPA Standards Council established the Disaster Management Committee in 1991 and the committee presented their work to the membership for adoption in 1995. In the year 2000, this document transitioned from a recommended practice to a standard. It was at this time that the committee began to take a “total program approach” (NFPA, 2010).

Over the course of the next few years, the committee updated the document to reflect standardization within its editorial formatting and presentation, as well as to develop the outline for disaster/emergency management and business continuity. The most recent version, written in
2010, reflects continued development in conjunction with the Federal Emergency Management Agency (FEMA) to include prevention as a specific aspect of emergency management, paralleling it with related disciplines.

NIMS as a component of a college or university’s emergency management plan can determine the atmosphere and approach for the overall operation of the institution during a disaster. More specifically, it can determine the manner in which the constituents of the institution assume their respective roles and responsibilities, as well as set the tone for an appropriate institutional response. Currently, the National Integration Center (NIC, formerly NIMS Integration Center) has left it to the states to adopt the NIMS standard voluntarily, only limiting preparedness grant funding based on compliance (R. Purvis, personal communication, January 28, 2011). Several states have addressed NIMS directly, and have issued directives to state run colleges and universities to implement NIMS under direct orders from the states’ governmental offices. Yet, it remains unclear how many public colleges and universities have become compliant with the NIMS implementation directives in their states. Further, there are no quantifiable measures of private institutional compliance with the NIMS directive, since, thus far, due to the inherent differences between public and private institutions, NIMS compliance has been primarily directed toward public institutions.

Of additional concern is the fact that little is known about what may lead one institution to become more heavily focused on disaster preparation than another institution. It might be assumed that a major disaster, with an obvious planning lapse, would stimulate such action. This is certainly true for institutions on the Gulf of Mexico coastline, as well as places like Virginia Tech. Yet, in the aftermath of those events, what is it that may lead some institutions to emphasize disaster preparation while others lag in attention to the issue? Knowledge of this
information might provide helpful insights to where the state and federal governments could
direct resources to ensure the highest level of compliance possible.

**Purpose of the Study**

Given the limited literature on emergency preparedness in higher education, combined
with federal and state directives that are increasingly expecting institutions to engage in
substantive disaster planning, a study of preparedness within the NIMS framework was timely
and needed. Hence, the purpose of this study was to investigate disaster preparedness within
U.S. higher education to ascertain levels of NIMS compliance. Furthermore, the study sought to
investigate factors that may impact the degree of emergency management preparedness. These
combined intents were designed to inform both practice and policy, the latter being particularly
important given current U.S. Department of Education (ED) funding programs to support
disaster preparation plan development in higher education institutions (HEIs).

**Research Questions**

The two research questions that guided this study were as follows:

1. How prepared are U.S. colleges and universities for disasters?

2. What influence do particular organizational and institutional context factors have on
   all-hazards emergency management preparedness at U.S. colleges and universities?

Using NIMS compliance as a proxy for disaster preparation, the aim of Question 1 was
descriptive in nature, namely, reporting data on the frequency of institutional implementation of
the NIMS standard, including mean, standard deviation, and frequency values. With the intent to
inform the process of NIMS implementation, Question 2 sought to examine the association that
contextual factors have with the level of NIMS compliance at an institution. This question’s goal
was an understanding of the relationships between certain factors and the application of the NIMS protocol within the organization.

**Definitions**

The list below defines key terms that guided this study. These definitions provide a basis for understanding concepts that are germane to higher education, disaster preparedness, emergency and crisis management, organizational theory, and organizational leadership.

*Disaster/emergency/catastrophe/crisis:* The first subsection in Chapter 2 provides a detailed examination of these terms.

*NFPA 1600:* This is the National Fire Protection Agency’s Standard on Disaster/Emergency Management and Business Continuity Programs. The 2010 document is the most recent, with the next follow up due in 2013.

*NIMS–National Incident Management System:* This is the DHS’s framework providing structure to organizations who work together to prepare for, protect against, respond to, and recover from the entire spectrum of all-hazard events.

**Significance of the Study**

An obvious reason to do a study on disaster/emergency preparedness is to evaluate approaches that work well and yield positive results that can inform both governmental policy and the disaster preparation work at educational institutions. Positive measures that are applicable to reduce the impact of disasters/emergencies could save enormous amounts of time, money, and energy in disaster recovery, allowing a redirection of those saved resources to endeavors that are more productive and germane to the work of the academy (Mitroff, 2005). Further, the actual fiscal drain on the institution and the redirection of human resources from customary duties during emergencies are not the only costs associated with
disasters/emergencies. There is collateral damage caused by the loss of momentum and confused
direction for the institution (FEMA, 2003).

Yet, the greatest overall potential loss to the academic community is not sourced in the
buildings, archives, or institutional heirlooms. It is the loss of treasure in the human
community—the deaths and injuries of loyal and productive personnel, and/or the deaths and
injuries of students—the primary purpose, function, and future of the institution. The buildings
can be fortified or rebuilt, but the human losses are unrecoverable, and shake the foundation and
confidence of the institution at its core. To face such losses when they might have been
prevented through adequate preparation is particularly tragic.

Additionally, scholars have suggested that the institution and its leadership could face
liability for failure to prepare properly for disasters. Binder (2002), Chun (2008), Garris (2005),
Hinckley (2006), and Zdziarski, Dunkel, and Rollo (2007) all have agreed that institutional
responsibility in exercising reasonable care extends to proper preparation that includes disaster
response and recovery.

Another reason that this research is important is the emphasis that the federal government
currently has on incentivizing efforts to become better prepared and ultimately to adopt NIMS.
The ED is currently funding projects designed to encourage compliance with the NIMS disaster
protocol. Knowledge of particular factors that might be associated with institutional NIMS
compliance may suggest targeted ways of investing such resources.

Given the complexity of the higher education enterprise, with its unclear objectives and
outcomes, leadership in colleges and universities is a significant challenge (Cohen & March,
1974). Therefore, it is important to evaluate preparation based on institutional context, to
determine if there are any associations in HEI success with NIMS compliance. Along with this
is the fact that there is no clear understanding of the type of institution that is most vulnerable to falling behind in the preparedness process, why that might happen, or if it is happening. This study sought to help fill this gap in knowledge and practice.

Returning to Hurricane Katrina as an archetype for what can happen to an institution confronting a major disaster, Figure 1 provides a graphical overlay of the research space in which this study is embedded. Other than the central ring, much has been written on each of these topics separately, but no study has sought to integrate them within the context of factors impacting NIMS compliance. The intent of this dissertation was to help provide that integration,
in part through the literature review and in part through the development and testing of a statistical model suitable for informing policy and practice on disaster readiness.

**Organization of the Study**

This dissertation is organized into five chapters. Chapter 1 provided a context for the issue of disaster preparation, framed by the stark reminder of what can happen when disaster strikes. It also presented the problem that the study addresses, along with its guiding purpose. It closed by offering key definitions, while articulating reasons for the significance of the study. Chapter 2, the literature review, uses literature to position the study within the higher education context. The chapter initially discusses the literature on the subject of disasters and disaster preparation in organizations, including the knowledge base within the higher education enterprise. Next, it discusses some of the attributes that describe and define American higher education and its operation as it relates to measurable context factors. Included is a discussion on the legal environment at the American academy as it pertains to the duty to prepare. Next, by reviewing the theoretical framework of organizational leadership and institutional organization, it discusses the literature on academic organization and governance. Finally, in closing, the chapter provides a history on the development and adoption of the NIMS standard, including its application to higher education, and to the variables of interest. Chapter 3 presents the study methodology, including its design, a discussion of the sample, the variable operationalizations, the procedures for data collection, the telephone questionnaire, and the processes for data analysis. Chapter 4 presents the results of the study. Additionally, it covers the questionnaire responses, and both the demographic and institutional characteristics of respondents. Chapter 5 summarizes the study, discusses and interprets the findings, and provides implications for
institutions and government agencies, followed by the study limitations, recommendations for future study, and concluding remarks.
CHAPTER 2

REVIEW OF THE LITERATURE

This chapter organizes the literature review into three major sections. The first section provides a context for disasters and disaster planning, beginning with disaster concepts and a brief history of formal disaster research. It examines the background of disaster research and its application to organizations via a review of authors that have investigated the subject in a range of organizational and educational settings. It then transitions to a more specific knowledge base within the higher education enterprise using an example of a potential disaster that looms over U.S. colleges and universities, namely avian and swine flu: influenza.

The second section examines the theoretical constructs that place the study within the realm of leadership in higher education. It provides a general description of decision-making theory in the disaster and preparedness environment for educational institutions. Following this is a discussion on some of the attributes that explain and differentiate American higher education and its operation, in order to demonstrate both similar aspects and distinguishing features of HEIs when compared with other municipal and business organizations, as they concern disaster preparedness. A discussion on the legal landscape in higher education follows, which examines the metamorphosis of the relationship between the American academy and the diverse constituencies it serves, and discusses the institutional duty of legal responsibility for its
constituencies in preparedness. It closes with an explanation of collegiate organization and governance as it pertains to disaster preparation.

Finally, the last section of the literature review discusses the evolution and framework of NIMS and its application to higher education. More specifically, it examines the previous work on HEI preparedness and the lack of relationship of this work to the NIMS protocol. Next, it looks at the variables used in the study as they pertain to previous research. Finally, it examines the relationship of the NIMS standard to the study in the context of using NIMS implementation, measured by compliance, as a metric for use in this study. It closes with an examination of the application of NIMS to college and university disaster preparation. Figure 2 shows the progressively narrowing funnel shaped flow of the literature review in a graphical format.

**Contextual Foundation: Disasters/Preparation**

This section of the literature review establishes a general context for the study by examining terms and contexts for the concept of disaster. It presents a brief history and survey of disaster/emergency research, followed by disaster preparedness in organizations. Disaster preparedness in HEIs is explored next. The section closes by drawing the connection between the literature and the overall educational enterprise with a discussion of the avian and swine flu, a major disaster that might be on the horizon.

**Disaster Terminology**

There has been discussion of the different terms that best convey the nature of the events, aftermath, and consequences of specific incidents: disasters, emergencies, catastrophes, crises, etc. The earliest definition of disaster, originally written in 1950, is known as the Fritz definition (Fritz, Gorden, Krauss, & Quarantelli, 1950). Since then, multiple definitions of disaster have been proffered. Accordingly, Quarantelli (1985) pointed out that there was little consensus in the
1. Contextual Foundation: Disasters/Preparation

Disaster Research and Terminology
Disaster Preparation in Organizations
Disaster Planning in Higher Education

2. Theoretical Framework

Decision Theory in Preparedness
Institutional Attributes and Legal Duty
Organization and Governance

3. NIMS Genesis and Application to Variables

NIMS and its application to the research
Independent Variable Concepts

NIMS Compliance?

*Figure 2. Literature review flow diagram. (Dimmitt, TX tornado photo courtesy of NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory [NSSL])*
definition of disaster, and posited that researchers should clarify the notion of disaster and its consequences since much of the research used the term. He suggested that in popular research, the study of disasters was effectively the equivalent of the study of emergencies, saying, “whether the term ‘disaster’, ‘catastrophe’ or ‘emergency’ is primarily used, appears to depend on the particular language involved” (Quarantelli, 1985, p. 1). Dynes and Drabek (1994) admitted that they made “no attempt to define the limits to what might be called ‘disaster’ research” (p. 7) leaving open the notion of the underlying agent studied in that research, whether it be a disaster, a crisis, an emergency, etc.

To clarify the term, Quarantelli (2000), as well as Barnshaw, Letukas, and Quarantelli (2008), denote a difference between everyday emergencies/routine accidents and disasters, and as such, the former are not considered here. Quarantelli emphasized the need to differentiate between terms, suggesting that there is a conceptualized differentiation between disasters and catastrophes by disaster researchers. Authors continue to insist on differentiation between terms. Quarantelli explained that catastrophes are worse situations than disasters, indicating that the extent of damage denotes term usage. Interestingly, though Quarantelli referred to disasters and catastrophes as occasions that generate crisis, Mitroff (2005) suggested that a crisis is a separate incident in and of itself; an event in an organization’s life that threatens organizational existence. Mitroff’s focus has been primarily business and industry-based research. Barnshaw et al. noted that theorists have been pushing for greater distinction between the terms used in disaster study. Blanchard (2009) diligently compiled the results of this specialization in defining all-hazards incidents. His document provides more than 100 entries for the definition of disaster, alone, and more than 25 entries for catastrophe.
Yet, as recently as 2008, researchers indicate that the vagueness associated with the use of the terms disaster and catastrophe remains an issue. Braga, Fiks, Mari, and Mello (2008) affirmed the consistent lack of clarity between the terms used to describe these incidents. Perry (2006) suggested that the process of determining accurate term definitions is arduous; noting that further complicating this ambiguity in terms is the effort to create valuable definitions directed toward a specific purpose and audience, in order to place it into a meaningful context. Barnshaw et al. (2008) commented that the effort to define and conceptualize the study of disaster has been ongoing for over 50 years. Quarantelli (1991b) said this about the issue, “Given these variants about the concept, it is not surprising that no one formulation is totally accepted within the disaster research community” (p. 2).

Quarantelli (1991b) highlighted an interesting phenomenon that could impart confusion to disaster study, namely that some researchers preferred to tie the concept of disaster to the physical, agent-specific cause, such as hurricane, flood, earthquake, or other hazard. He cautioned against this, suggesting that this results in some redundancy in disaster preparation leading to multiple plans, due to agent specific incidents.

This leaves open the use of various terms in general discussion on disaster and preparedness research. Accounting for the inconsistency in consensus of disaster researchers and the inherent variation of these discussions, this document does not attempt to endorse the use of any one specific term for these types of incidents and thus uses terms interchangeably, which encompass the nuances intended by previous definitions of the terms: disaster, catastrophe, emergency, crisis, etc.
Disaster Research History and Overview

Dynes and Drabek (1994) noted that historically, disasters were not studied in an academic environment. Disasters were considered societal misfortunes but were not significant topics of study, even in light of the fact that disasters have shaped much of human history. The genesis of the formalized study of disasters is relatively recent. Though the seminal research took place in 1920, and was the first systematic/scientific study of a disaster occurrence, very little was done until the second half of the 20th century (Dynes & Quarantelli, 1992). The original study examined the aftermath of a massive fire and armament detonation onboard a ship in the harbor at Halifax, Canada. Quarantelli (1989) noted that following that initial study, there was virtually no other theoretical/research work done until the 1950s. Quarantelli (2009) cited Carr’s 1932 article about the impacts of disaster on society. Dynes and Drabek suggested that Sorokin did the first theoretical work in his 1942 book on the psychological impacts of disasters on humans.

Both Quarantelli (1989) and Dynes and Drabek (1994) agreed that the impetus for disaster study as a discipline began in the mid-1950s, when the U.S. military initiated research to examine disasters during peacetime in an attempt to extrapolate the results to a projected domestic conflict environment. Consequently, most of the initial work was concentrated for many years in the United States. Interestingly, this appears to be the seminal use of research to inform public policy on disaster planning and response. While this notion of driving policy did not appear to be as central in subsequent years after the 1950s, it has today become more widespread since the establishment of centers for disaster study at universities around the country. The development of material from both the public policy and political science arenas has been instrumental in the process “to completely re-conceptualize disaster policy” (Dynes &
Much of the early disaster research focused on the social aspects of disaster and crisis. This is evident in research from Dynes and Drabek, as well as Quarantelli (1991a).

Currently, there are multiple centers for disaster study, including the University of Delaware’s Disaster Recovery Center, the University of Colorado’s Natural Hazards Center, and the University of North Carolina’s Hazard Reduction and Recovery Center, among others, all with the potential to exert public policy influence. These centers are typically associated with, and rooted in, a department of sociology at their respective institutions. However, more recently, HEIs have begun formal educational programs in emergency management and disaster response. The inaugural program started in 1983 at the University of North Texas. Within a decade, more emergency management programs began to spring up at other institutions around the country and the world. With the inception of these programs, emergency management has been established as its own unique discipline. Many of the emergency management programs are still sociology based. Today, there are more than 200 programs at HEIs around the United States. The history of disaster research centers combined with these formal academic programs firmly established the connection between disaster study and the American academy. Yet, the implementation of disaster preparedness and emergency management did not have its genesis in the academy.

**Disaster Preparation in Organizations**

“Martial arts masters say that the highest form of self-defense is not being there when the trouble starts. Just so, the highest form of crisis [management] is crisis prevention” (Bernstein, 2000, p. 3). Mitigation and prevention is a clear trend in emergency management today. The field of Emergency Management has grown out of the increase in frequency of disasters, of all types, over the last 25 or so years. Blanchard (2008), Mitroff and Anagnos (2001), Perry (2007),
Quarantelli (1991a), Roberts and Lajtha (2002), and Shrivastava et al. (1988) all noted an increase in disaster occurrences. Mitroff, et al. (2006) indicated that the current state of disaster planning emanated primarily from the business world, rather than from academe. Though the study of disasters was examined primarily from a sociological response perspective in academe, and relatively recently at that, Mitroff and Anagnos as well as Wilson (1992) suggested that much of the functional work on disaster planning and crisis management has been the result of the development of what is now known in the business world as risk management and business continuity planning. Mitroff and Anagnos suggested that the concepts associated with crisis preparation and management began the process of coalescing into a discipline with the Tylenol poisonings back in 1981, in what Shrivastava et al. reported as outstanding corporate crisis management.

Initially, active crisis management was associated with industrial accidents, noted Shrivastava (1988). Some examples are Three Mile Island, Union Carbide - Bhopal, or the Exxon Valdez. More recently, disaster research has grown to encompass all aspects of modern life following the September 11 attacks, Hurricane Katrina, and the Virginia Tech Shootings.

Interestingly, due to the susceptibility of computer information systems to even non-disaster occurrences, the information technology (IT) community has been aggressive in their approach to disaster preparedness. Recovery of IT is a natural extension of the regular day-to-day maintenance required of these oft-volatile systems. Much effort has gone into addressing this problem for the reinstatement of these systems, under the typical ubiquitous nuisance computer outage, that has become applicable under the disaster-time reinstatement of these systems. Nollau (2009) pointed out that there are regulations for validation and compliance of “disaster recovery and business continuity program[s] within the IT discipline for 21 CFR 11,
Electronic Records and Signatures” (p. 53). Yet, IT is but one small portion of an organization’s or educational institution’s responsibility in disaster preparedness and recovery. Still, Chun (2008) reported that in 2007 that 56% of HEIs had a strategic plan for disaster recovery of their IT department, and the 2010 Campus Computing Project survey report indicated little progress toward strategic disaster recovery planning, with 62.7% of surveyed HEIs having disaster recovery plans (Green, 2010).

**Disaster Planning in Higher Education**

It is likely that many HEIs have in recent years created some sort of contingency plan for disaster incidents on their campus. After Hurricane Katrina, Lipka (2005) quoted Michael Middaugh, president of the Society for College and University Planning and assistant vice president for institutional research and planning at the University of Delaware, as saying “I would be amazed if there was an institution in this country that's not going back and reviewing its disaster policy” (p. A28). Yet, lacking guiding principles and rich best practice examples, the potential variation and lack of standardization in those campus plans is likely extensive.

The variation in plans could be due to the complexity of the higher education enterprise as noted by Cohen and March (1974), as well as Shrivastava (1988) and Farber (1982). Of significant challenge to the leadership in colleges and universities is the fact that disaster incidents are increasing due to institutional and system complexity. The reality that the complexity of systems, processes, and institutions creates ever increasing potential for catastrophic failure is one of the major reasons provided by leading crisis management and disaster preparedness researchers such as Mitroff and Anagnos (2001), Shrivastava et al. (1988), and Perrow (1984).
As previously affirmed, the current state of disaster planning had its genesis in the corporate rather than the academic world. Mitroff et al. (2006) suggested that, “there is virtually no national research that details how colleges and universities have prepared for such events” (p. 62). Trump (2000) inferred that little research on crisis preparedness strategies in academia exists, because there has been little interest and/or little funding for conducting this research. Bickel and Lake (1999) indicated that there is a general tendency for academia to view the campus as a peaceful and safe place. The Kreps and Bosworth (1994) erudition supported this by suggesting that a large portion of disaster planning “is not substantial, mainly because of the infrequency of events, the absence of resources and constituencies to promote hazard awareness and mitigation, and considerable uncertainty about how much of either is needed” (p. 63). Mitroff et al. (2006) noted that HEIs typically are prepared only for those types of disasters which they have already faced.

Historically, although the American academy has sustained damage through natural hazards, it has largely remained immune to the types of artificial incidents that have plagued the corporate and municipal worlds—until recently. Even a thorough search of the archives at two major university disaster centers revealed that little, if any, research is directly focused on disaster preparation for HEIs, supporting Mitroff et al.’s (2006), Trump’s (2000), and Kreps and Bosworth’s (1994) observations, and further indicating that a significant gap in the literature exists.

(2001) described case incidents in detail, as well as both individual and institutional response and reaction. While this body of research is still relatively small, it is a helpful foundation for broader generalized research. Chapter 1 presented several brief case examples of disaster incidents on campuses around the United States. Recent events, such as Hurricane Katrina, the campus shootings in Virginia and Illinois, and the potential for pandemic disease outbreaks with the bird and/or swine flu, have alerted campus administrators of the looming potential for disaster in their proverbial backyard (Osburn, 2008).

Of the limited research available that directly evaluates disaster preparation in HEIs, Chun (2008) examined the disaster preparation of private, four-year institutions in the state of California. He found that all of the institutions studied had some form of disaster plan in place, though not all plans were equally sophisticated. Chun found that varying preparedness levels existed among the HEIs he surveyed. The “documents varied from a few pages to a binder-thick manual, varied in the amount of included detail, differed in terminology and content, and differed in consistency and standardization from one another” (Chun, 2008, p. 103). He reported that natural disasters formed a common thread of impetus toward disaster preparation in these institutions. While NIMS was a topic of discussion in the Chun interviews, it remains unclear from his research as to how many of the institutions were NIMS compliant. Chun did report, however, that there was a potential reimbursement funding impetus that drove some of the institutions to strive for NIMS compliance.

Another recent study looked at the residential community college system in Texas. Jenkins’ (2008) study showed that “administrators of Texas community colleges with residential student populations had not developed adequate crisis and/or emergency response plans” (p. 75). His research suggested that “the top leadership of an institution… provides a significant
influence on any planning and preparedness efforts conducted by the administrators of the organization” (Jenkins, 2008, p. 76). This, he said, was evidenced by the leadership having “fallen short of adequately preparing their institutions by failing to develop written communications protocols for use during a crisis situation and/or training their staff on what to do and how to respond in the face of an emergency” (Jenkins, 2008, p. 77).

Hartzog (1981) studied senior colleges with enrollments of 5000 or more students, and found that emergency management planning had increased over the ten-year period prior to his study. However, administrators at only one-third of the institutions considered preparedness planning to be of major importance. Hartzog recognized variation in planning approaches, noting that these duties were typically the responsibility of a leader over the administration, operations, business, or finance departments. He indicated that direct oversight was assigned to the manager of the security or safety office. Hartzog suggested that preparedness planning at HEIs was less centralized and more diverse as compared to other organizations.

From this variation of disaster planning effort appearing across the academic spectrum come attempts to develop plans and procedures to position HEIs as better prepared for disaster occurrences. Osburn (2008) noted that while the literature does provide a couple of potential models for developing disaster prepared HEIs, it does not provide any mechanisms or instrumentation to evaluate preparedness plans at HEIs. He pointed to FEMA’s (2003) Disaster Resistant University model and Quarantelli’s (1997) principles as potential options available to institutions. He asserted that institutions would benefit from the development of assessment tools to provide for the evaluation of institutional disaster plans and procedures, providing important feedback paths to strengthen the efforts already in place across higher education, as well as a foundation for further research.
Wenger (1978) suggested that crisis management capability is not only based in the resources that can be brought to bear on facilitating disaster response, but must be grounded in institutional planning for such response. Farber (1982) made an extremely strong statement regarding the planning and preparation of HEIs for disasters, “[a] higher education institution that responds to a disaster with no clear channels of authority or sense of purpose and direction, has usually lost the ability to handle the necessary tasks which must be performed to overcome the disaster” (p. 23). Yet, precisely because of these diverse efforts, and a similar range of efforts within the business and municipal spectrum, there is a need to standardize the process to mitigate, prevent, prepare, respond, and recover from disasters. This trend toward disaster preparedness and emergency management across the spectrum of organizations, from municipalities to industry, culminated in the development of the NIMS.

As it relates to HEIs, the Higher Education Reauthorization Act (2008) requires HEIs to have preparedness plans in place. This document reads as follows:

The Secretary shall continue to coordinate with the Secretary of Homeland Security and other appropriate agencies to develop and maintain procedures to address the preparedness, response, and recovery needs of institutions of higher education in the event of a natural or manmade disaster with respect to which the President has declared a major disaster or emergency. (p. 122)

Today’s HEIs require a significant investment of time and resources to develop and maintain a disaster preparedness and recovery plan that covers all aspects of the academy, including the health and welfare of institutional constituents. As an example of a potential disaster that has captured the attention of leaders at many HEIs recently, and is providing some impetus for administrators to find the resources and time to develop disaster plans, the following
section of this chapter outlines the potential for a pandemic outbreak of the avian, or bird, flu; a concept that has been reinforced recently by the possible swine flu pandemic outbreak of 2009.

**Pandemic Flu**

The potential for an avian or swine flu epidemic/pandemic has been the focal point of national, local, as well as HEI disaster preparation in recent years, so much so, that Harvard Business Review dedicated a special issue to the subject of a pandemic outbreak. Bennis (2006) suggested that, “[i]f a worst-case scenario unfolds as a result of avian flu, organizations will be stressed in ways that can’t be fully anticipated” (p. 24). Therefore, HEIs must make every effort to establish plans to not only respond to a pandemic disaster, but also attempt to prevent a pandemic from disabling institutional operations. Additionally, according to Susser (2006), institutions with substandard plans and policies for handling a pandemic outbreak could be at risk for, “a laundry list of HR-related legal concerns” (p. 34).

Yet, a significant outbreak could happen on a college or university campus. The reason is quite simple: no place is immune to the horrors of a pandemic, and in actuality, some segments of society are particularly vulnerable. Consider the campus environment. Turner (2005) asserted that the following environmental contributors created an opportune environment for widespread infiltration of a flu-type pathogen—close quarters in classrooms and dormitories; diverse student and faculty populations; large athletic events that draw thousands of people, among other potential factors facilitating the spread of disease. Combining these elements with other aspects of collegiate life, such as a highly mobile faculty, staff, and students, it is clear that widespread exposure to, and by extension the ability to spread, pandemic pathogens is easy. These environmental conditions create the potential for the rapid spread of pandemic disease.
Turner (2005) suggested that institutions with a disaster plan component for dealing with respiratory pathogens have a head start in the pandemic planning process, a process that he says is essential for every institution. The American College Health Association (2006) has published an operating framework for institutions to develop plans and procedures to deal with a pandemic situation.

Looking back in history to 1918, collegiate institutions around the nation dealt with the deaths of students from a pandemic outbreak of flu. Dowell and Bresee (2006) noted that as many as “50 million people may have died as a result of the 1918–1919 influenza, and millions more died in the pandemics of 1957 and 1968, each of which resulted from virus mutations” (p. 22). Thus, the potential for a disaster on America’s academic campuses, due to a pandemic or other natural hazard, is very plausible.

**Theoretical Framework**

This section of the literature review provides a theoretical framework that supports the study. It presents a description of the decision-making process in disasters, an important perspective to reflect on when considering why institutions may or may not be implementing NIMS. Next, it addresses some of the attributes that distinguish colleges and universities from other business organizations to demonstrate some of the inimitable traits of the American academy. This leads to a discussion of the legal environment pertaining to preparedness, as examined from the perspective of demonstrating the responsibility of duty that the academy has for its constituencies. It closes with a discussion of the organizational structure of HEIs, and how this may underlie disaster preparedness.
Decision Theory in Disasters and Preparedness

Classical decision-making comes from the field of organizational behavior. Farber (1982) noted that, “There are almost as many definitions of ‘decision-making’ as there are writers on the subject” (p. 9). Decision-making as a method can be distilled down to the process of choosing the best of competing alternatives. It typically has multiple steps associated with the process. Weber (1979) outlined one decision-making approach via the following steps.

1. Problem recognition: Characterize the boundaries of the problem and the requirements that the solution must provide.
2. Identify alternative solutions: Formalize the list of potential alternative solutions.
3. Contrast competing solutions: While managing the advantages and disadvantages of each competing solution, identify the significant consequences of each.
4. Select the best solution: Identify the best matching alternative for the requirements established in the first step.

The decision-making process is an important part of preparedness. It not only influences how an institution prepares for disaster, but, more importantly, if an institution prepares at all. There are studies on organizational behavior in disaster conditions. For example, Quarantelli (1984) examined organizational behavior in disasters. However, as previously stated, there is a paucity of information about how HEIs develop a preparedness status for disasters. This includes decision-making both before and during disasters. Concentrating on the latter, Wilson (1992) and Farber (1982) completed studies on disaster-time decision-making in HEIs. Wilson noted that, “Crisis decision-making is characterized as decision-making under extreme pressure, serious time constraints and potential threat” (p. iv). She, therefore, suggested that the
implementation of decisions must be made far before a crisis is happening. Yet, she gave only a cursory mention of decision-making in her conclusions.

Farber (1982) suggested that preparedness depends on the “quality and quantity of emergency-related resources within an institution” (p. 160). Taking it one step further, he stated that the availability of resources also influences preparedness plans. However, before resources become available, the decision to dedicate those resources to preparedness must happen. Farber’s qualitative study concentrated on how decision-making changes under the adverse conditions of disaster. He maintained the following perspective on the subject:

An understanding of planning and control of decisions at the various levels in the higher education structure “indicates that it is a unique managerial system, significantly different from that found in other organizations. The concept of shared authority and decision-making permeates the university.” (p. 23)

This shared governance concept is one of the unique attributes of HEIs, in general. Shared governance implies distributed decision-making, which illuminates one of the main characteristics of decision-making in many HEIs. Yet, Farber’s findings indicated that disaster-time decision-making is constrained to few individuals in higher-echelon positions within the institution. Farber pointed out that, “Reactions to disaster events tend to center authoritative channels of control in the hands of a few individuals…” (p. 22). He called this a “contraction of authority” (Farber, p. 22).

Wilson (1992) cautioned that, “decision making under such conditions is often poor at best” (p. iv). Farber (1982) noted that post-disaster decision-making became more difficult due to lack of information, which further exacerbated the situation. Additionally, he indicated that disaster-time decisions are made more quickly and with less consideration of alternatives than
under normal decision-making conditions. He suggested that this created a situation where decision quality is inversely proportional to decision speed. The outcome is that decision quality is reduced by providing a less efficient approach to the decision-making process, resulting in fast, but potentially less efficient and lower quality, solutions to disaster-related problems.

Binder (2002) suggests that:

Decision making in an emergency, even by technical experts, may be difficult, so employee awareness is a foundation of any emergency action plan. Employees must be prepared to act virtually instantaneously, perhaps even instinctively. Yet split-second decisions made during an emergency, without proper training and familiarity with the emergency action plan, may worsen the situation. (p. 5)

Quarantelli (1984) supported these findings, saying:

[Leadership] personnel who remain on the job around-the-clock during a disaster will eventually collapse from exhaustion or become inefficient in their decision-making and other areas of responsibility. More importantly, when such officials are eventually succeeded by others, their successors will lack certain information to exercise the necessary authority, because crucial data will not have been formally recorded. Decision-making requires relevant knowledge. Officials with the appropriate information will not always be physically capable of working beyond a certain point. (p. 16)

Farber’s (1982) results have some interesting implications for faculty, and portend a strong message. Specifically, in order to have input and direction from the faculty bear on, and influence, disaster-time decision outputs, the faculty must participate in preparedness measures prior to a disaster occurrence. Otherwise, contraction of authority suggests that faculty influence will not happen. Moreover, in order for faculty consideration and evaluation of alternative
strategies to be integrated into preparation, response, and recovery efforts prior to and during
disaster-time decision-making, their input needs to be considered in advance, as Wilson (1992)
noted.

How decisions are made in an institution is not under scrutiny here. However, this
provides a backdrop against which the issues surrounding preparedness might be illuminated.
Since HEIs are unique organizations, as Farber’s (1982) distributed decision-making process
argument demonstrates, the discussion will be benefited by an examination of some additional
features that delineate HEIs from other types of organizations, and how these may affect disaster
preparedness; topics discussed next.

Attributes of Higher Education

Authors have cited the need to characterize HEIs as unique entities within the spectrum
of organizational structures. Winston (1997) examined HEIs in comparison to the corporate
world with important conclusory results. Bowen (1980) suggested some interesting aspects of
HEI operation that delineate them from other organizations. Bickel and Lake (1999)
acknowledged that there must be recognition, “that the university is a unique, if sometimes
business-like, environment” (p. 105). Zemsky (1990) suggested unique ways in which the
structural elements of institutional leadership change over time with respect to the administration
and the faculty. Today, however, with the contraction of resource flows from traditional sources
(e.g., states), and increased competition for limited resources, universities have had to become
more entrepreneurial, blurring the distinction between industry and academe in ways that were
less so in the past. This subsection examines some of the inimitable qualities and traits of the
American academy, looking at how the issues may surround HEIs in both enhancing and
detracting from their ability to develop and/or adopt a disaster preparedness plan such as NIMS.
Bowen (1980), Winston (1997), and Zemsky (1990) discussed some of the American academy’s peerless traits in articles that sought to explain some of the differences between corporate entities and academic institutions. These authors have outlined some of these differences, arguing that there are a number of foundational issues that distinguish HEIs. These may impact disaster preparedness.

The lattice and the ratchet. First, an area of potential impact on preparedness might be due to an interesting phenomenon presented by Zemsky (1990). He discussed a concept called the administrative lattice and the academic ratchet. The administrative lattice is a situation where the institutional administration grows in an almost lock-step form much like the crystal lattice structures from chemistry. Zemsky suggested that administration has grown around 60% between 1975 and 1985 as compared to the 6% growth of the faculty over a concurrent time period. The growth in administration is due to several reasons—regulatory issues, consensus management techniques, and administrative entrepreneurialism. Regulatory issues drove the size of administration up. This is because institutions needed offices with administrators and staffs to deal with the regulatory agency issues of reporting, financial aid, environmental issues, EEOC, etc. Each time regulatory agencies changed rules or expanded jurisdiction, it had an effect on the size of the administration. This created administrative growth in a structural form.

Next, Zemsky (1990) claimed that consensus management techniques drove the cost of administration ever upward. This is because this type of management seemed to reduce accountability, while increasing the needs for staffing. In fact, the authors suggested that many administrators have become more like solicitors moving between the different offices of the leaders that they support.
Finally, administrative entrepreneurialism grew the administrative lattice. The example Zemsky (1990) used is that of student advising. Many institutions went to an advising scheme where permanent academic advisors did student advising. This was once the realm of the faculty, yet it was given over to the administration supporting its continued growth. In general, the faculty welcomed this change process, so they could focus on their research/scholarship and related work. Another factor driving entrepreneurialism is the prestige attributed to growing one’s unit rather than downsizing it. This is interesting, and speaks directly to the flipside of this issue, namely the academic ratchet.

The academic ratchet is the metaphor that Zemsky (1990) used to describe the way that faculty have systematically disengaged with the institutional mission. He suggested that each time the academic ratchet turned, the faculty took another step away from the centralized activity of the academy to instead focus more on the issues of personal professional growth, particularly scholarship in the field that brought prestige. The upshot of this is that the historic, long-term and symbolic relationship that typically existed between faculty and their institution was eroded in recent decades. Faculty members were more interested in career mobility through publishing and service opportunities that enhance their careers.

There might be potential issues with respect to disaster preparedness in HEIs associated with these concepts. On the one hand, the fact that administrators are concentrating on drawing consensus about daily institutional operations and regulatory issues might hamper disaster planning by diluting their efforts to develop support for creating necessary preparedness plans and procedures. On the other hand, that the faculty has disengaged with their traditional role creates a situation where the professoriate may not only be unable to affect immediate change, but they may not even recognize the need for these plans and procedures because of career and
other distractions. Additionally, there might be strong reticence on the part of the faculty to accept and acknowledge any responsibility for disaster preparedness. As the government works toward NIMS compliance for all organizations and institutions, regulatory issues will invariably increase, which in turn may further impact administrative action on compliance for HEIs.

**The donative-commercial nonprofit and revenue flows.** Next, Bowen (1980) and Winston (1997) described other aspects that make HEIs unique in the organizational world. Winston noted, first, that the academy operates under a non-distribution constraint, that is, it does not distribute profits to owners/shareholders. Second, he suggested that the academy takes on a hybrid form that exists somewhere between a commercial nonprofit enterprise and a donative nonprofit organization. He called this model the *donative-commercial nonprofit*. Third, Bowen considered the overall cash flow and spending trends in HEIs, characterizing this in his *revenue theory of cost* approach for higher education.

Examination of these concepts in further detail elucidates some interesting points. First, Winston (1997) suggested that nonprofits have a defining restriction, what he calls a *non-distribution constraint*. While nonprofits can make a profit, they do not distribute it to their owners/shareholders, since there are no owners. Winston noted that this type of institution is found in markets where there is asymmetrical information, i.e. one where the consumer does not really know what, or even if anything, is being purchased. He suggested daycare and nursing home services as alternative examples to education, and noted that this is understood as a *trust market*. In the educational marketplace, not only do people not know what they are buying, but also, they are not able to discern it for extended periods. They trust that they are purchasing something of value, and they trust that the environment where they will be living and learning will be conducive to those goals, including the need for safety. Since students have little by
which to judge an institution’s disaster preparation plans, they simply are left to assume that such situations have been considered.

Second, the higher education environment also creates a unique situation for administrative leaders, such that unlike in for-profit firms, in higher education there is no real economic reward pressure to strive for efficiency in managing the enterprise. Winston (1997) suggested that, on the one hand, this may lead to higher public trust in an institution’s statements and decisions, due to the lack of a profit motive, thus reducing the potential for the personal gain of the institutional leaders. On the other hand, it might lead to reduced public confidence in an institution’s ability to perform, since the environment lacks sufficient motivating reward structure to incentivize administrative performance. Lack of motivation for efficient management may lead to poor institutional performance, overall. In turn, this may lead to the potential for preparedness to be overlooked in favor of other institutional work or even simply maintaining the institutional status quo.

Said another way, there is a notable difference in the motivating factors for the administrators of colleges and universities, vis-à-vis leaders in for-profit settings. HEI leaders might be motivated by idealistic concepts, such as caring about educational excellence and the students (Winston, 1997). This might be another motivating factor to direct resources away from preparedness to other legitimate institutional activities, leaving little or no funding for disaster preparation. Bickel and Lake (1999) support this position via their research suggesting that institutions “have a tendency to allocate resources to educational and other endeavors first” (p. 5) before concentrating on some safety issues. Jenkins (2008) suggested that some administrators are not sufficiently motivated to commit the resources required to prepare adequately for events that might never take place.
Third, another factor unique to HEIs, which has potential disaster preparation implications, has to do with the nature of institutional goals that are typically quite general, such as educational excellence and the dissemination of knowledge and truth. Since the academy provides so many positive opportunities for making contributions to the common good, there is always some initiative that is worthy on which to spend money. Bowen (1980) characterized this in his *revenue theory of cost* for higher education, proffering a concept that is unique to higher education. Institutions tend to try to expand their reputations and move toward what they perceive as excellence in academia. Both society, as a whole, and the individual benefit from this work. Since institutions try to maximize their revenue flows to support this work, and they spend it all in doing this work, the cost of higher education grows. From a mathematical perspective, the cost space of higher education always expands completely to fill the revenue space as institutions do the noble work of the academy. It is possible that the higher costs of education will promote the administration’s intentional neglect of preparedness due to expense. Bickel and Lake (1999) indicated that “bottom-line administrative mentalities can disserve safety and fracture any sense of shared responsibility for safety on campus” (p. 6).

For these reasons and others, the academy is an unusual operational environment unlike any other in business and industry today. Thus, while HEIs have much in common with the business world, they are unique in other ways. Another of these unique features is the legal environment under which they have operated.

**Legal landscape in higher education.** Relevant to the discussion of unique characteristics of HEIs, with implications for disaster preparation, is the legal context in which the industry functions vis-à-vis students. Historically, institutional responsibility for the student has shifted over time. It began with *in loco parentis*, or in place of the parents, and culminated in
the duty era that characterizes the legal relationship to students in today’s HEIs. Metamorphic is a helpful metaphor for describing the development of the legal landscape in HEIs during its enormous growth phase through the past century. While the concept of in loco parentis was formally established by Gott v. Berea (1913), from a legal perspective it was actually the de facto or customary standard from the inception of American higher education in 1636 with Harvard. The Gott court recognized the model with regard to the law, and set the tone for the first part of the 20th century. The term meant that an institution acted in place of the student’s parents, and thus had the authority to discipline much like a parent disciplining a child. Bickel and Lake (1999) referred to this period as the insularity era, not because of in loco parentis per se but because of the legal frameworks protecting HIEs from legal liability. This is because the academy was immune from the courts based upon “governmental or charitable tort immunity” (p. 29). The university was not required to provide a safe environment for the students. Yet, this started to change with the start of the 1960s.

In what Hendrickson (1999) called a watershed case in the evolution of higher education law, Dixon v. Alabama (1961) brought an abrupt modification to this relationship. The students won the right to due process and, according to Bickel and Lake (1999), the civil rights era was born. The authors characterize this era with the notion that the courts were now willing to step through the gates of the university, since the “constitution came to campus” (p. 7). Students were now being treated more like adults and accorded rights as such. Notably, this is the time of the Vietnam War, and largely, the war drove many issues on the American college campus. The nature of the relationship between students and the academy became somewhat adversarial. Protests arose that eventually led to a change in the age of majority, and once this change took
place, legal adults came to campus. At the same time, the traditional immunity protections began to erode as well.

In the later 1970s to mid 1980s, now that legal adults were on campus, the notion that students were responsible for themselves took hold. Students were on their own when it came to safety. Bickel and Lake (1999) referred to this period as the “bystander era” (p. 9). Here the university became somewhat insulated from tort and negligence liability based, not upon charitable or governmental immunity laws, which by then were nearly gone, but rather on the fact that students were constitutional adults and as such, institutions had no duty to them. This primarily can be seen through the Bradshaw v. Rawlings (1979) case, in which the courts established this institutional bystander position, and in subsequent cases, Baldwin v. Zoradi (1981), Beach v. University of Utah (1986), and Rabel v. Illinois Wesleyan University (1987) where the bystander position was affirmed, insulating institutions from legal liability, but from a different source than during the in loco parentis era. This period, and the following one, can be viewed as more sedimentary, since the relationship is progressing toward one where case law is settling issues on an individual basis, rather than the earlier blanket type court decisions.

From the mid 1980s to the present, Bickel and Lake (1999) described the duty era, a time where the academy must accord its constituents the rights of a consumer. This is much like the relationship between a property owner and a tenant. What defines this era is the notion of duty that a reasonable party would provide in a given circumstance, more specifically, the need to provide a reasonable safe environment as it regards the operations of the institution. Bickel and Lake described the era as an “interstitial and transitional” period (p. 106). They denote several key cases as leading this transition era, including Furek v. The University of Delaware (1987), Poulin v. Colby College (1979), and Tarasoff v. Regents of the University of California (1976).
These cases indicated a departure from the no duty movement. The *Furek* decision, though far from a return to *in loco parentis* doctrine, was seen to usher in the initial stages of the conclusion of the bystander era, (MacLachlan, 2000). *Poulin*, interestingly, is not an example of student relationships with institutions. It shows that an institution’s legal responsibility extended to all constituencies, denoting a significant change in the responsibility level that the academy has reached, primarily through the litigation process.

Bickel and Lake (1999) discussed the notion of the *facilitator* university, one that helps to coordinate services and education with intervention. This is the notion that the academy takes a proactive approach to legal relationships with students in order to mitigate issues before they happen. To this effect, Chun (2008) indicated that the American academy must consistently monitor the case law that refines the relationship between an institution and its constituents in order to advance policies and procedures. Further, Chun stated that, “[t]his duty of care adds a new dimension in crisis planning that sets it apart from business and civic organizations” (p. 14).

In fact, it is in this way that it could be argued that *in loco parentis* is creeping back into the academy. Perhaps this notion of facilitating takes a more charitable approach to the relationship with students, providing a more familial environment. It draws strength from the belief that parents try to help and care for their children, and this is what the institutions are starting to do, though it could be argued that many had never stopped. This is in some sense bound up in the notion of duty, but not in a disciplinarian way.

Of important note for this dissertation study, is the course by which the law has developed. Through the litigation process, cases and issues bubble up to create change that eventually settles out in the policies, practices, and the changing legal landscape of the academy. This may happen in the realm of disaster preparedness, as well. Lipka (2005) suggested that
institutions are being forced into a time when crisis management and endowment management carry the same importance level, and that institutions should prepare in order to reduce the exposure to potential litigation from angry constituencies. Chun (2008) purported that “[p]otential liability claims may arise also from the absence of a crisis plan, or inadequacy, or failure to follow the plan” (p. 33).

This reality is sourced in the nature of duty that courts tend to apply in determining legal liability. Bickel and Lake (1999) noted that a number of factors may apply to specific cases where a duty exists, including foreseeability of harm, nature of the risk, and closeness of the connection between the college’s act or omission and the student’s injury. This has been borne out through the casuistic process of legal determination. All of these are appropriate topics when considering liability associated with disaster preparedness.

In fact, legal advisors, including Hinckley (2006), have recently argued that a failure to prepare adequately for disasters/emergencies is a failure of an obligation to protect or exercise reasonable care, exposing an institution and its leadership to tort liability. Further, Hinckley asserted that, “other liability causes of action could be asserted as the result of poor planning” (p. 23). Binder (2002) noted that,

Emergency action plans are just a reasonable, logical extension of existing negligence analysis. Plans to respond to a disaster are just as integral in negligence analysis as exercising reasonable care to prevent an accident. Emergency action plans are just as critical in minimizing losses as design, construction, maintenance, operations and inspection. (p. 9)

As Binder suggested, a failure of the leadership to prepare the institution sufficiently for disaster/emergency occurrences might be a breach of duty. Moreover, Binder exhorted that
“failure to prepare such a plan could risk substantial liability under the common law if a tragedy results which a plan could have averted” (p. 5).

Garris (2005) confirmed this, quoting “organizations which have failed to plan for emergencies could be held liable in the event of a fatality or injury” (p. 28). Bickel and Lake (1999) noted that, “[A]s students are injured in preventable ways, universities will lose the insularity which arose in part from the unspoken presumption that colleges generally do a good job of providing safe learning environments” (p. 136). Hendrickson (1999) drew clear and concise conclusions about institutional responsibility, when he wrote that “liability will be found where the institution should have foreseen the danger in allowing a particular condition to exist. Institutional responsibility will also be involved where a duty exists to warn people of a foreseen risk” (p. 232). Considering Bok’s (1982) exhortation that HEIs should be held to the same ethical standards as other kinds of organizations, as it relates to their constituents, these legal ramifications are to be expected. Yet, Mitroff et al. (2006) found that institutional legal counsel was not well represented on crisis management teams in HEIs, which they noted as a surprising finding.

Hinckley (2006) suggested that “it is arguable that this duty is emerging from a ‘penumbra’ of different sources” (p. 21). Since one of those areas driving the institutional legal environment is recent case law subject to duty, how might institutions move forward with a proactive approach to disaster planning? Institutional organization and governance may affect the approach used at an institution for accomplishing disaster planning. Thus, a brief examination of these governance structures is timely to the discussion. Additionally, the decision-making process might be influenced heavily by the organizational structure of an
institution, ultimately resulting in an effect on compliance. As such, organizational structure and governance is examined in the next section of this literature review.

**Organizational Theory**

There is rich literature on the organizational theory of HEIs. Two theories that are particularly appropriate for this study include the models of organizational functioning discussed by Birnbaum (1988), and the frames of organizations more recently described by Bolman and Deal (1997). An overview of these two general theories of organization and behavior will provide a theoretical foundation upon which an understanding of how organization and governance might affect disaster preparation.

**HEIs through the lens of the collegial/human resource model/frame.** Birnbaum (1988) proposed the collegial model as characterized by the idea of the egalitarian process. The notions of servant leadership and “primus inter pares” (Birnbaum, 1988, p. 89) or first among equals, denote this model. In collegial organizations, participants have a sense of membership based on “specialized training [or] other identifying qualifications” (Birnbaum, 1988, p. 87). Participants respond to, and act within the context of, institutional tradition, while behavior shaping happens through social norms and interaction. Significant uniformity among values and backgrounds exist in a collegial institution, and participants have equal opportunities for participation in organizational decision-making. Birnbaum suggested that the liberal arts college is the best example of a collegial institution, though many institutions are likely to have some traits of the collegium.

Bolman and Deal (1997) proposed the human resource frame with its many parallels to Birnbaum’s (1988) collegial model. In this frame, the relationship between people and organizations becomes the key to functionality and efficiency. Behavior is constrained by
relationship. As such, a symbiotic bond develops where “individuals find meaningful and satisfying work, and organizations get the talent and energy they need” (Bolman & Deal, 1997, p. 119) for success, each benefiting in this system. Problems and inefficiencies are solved through training/education and redesign of work.

The long periods of deliberation in consensus building among the faculty, typical of the collegial institution, might hamper/delay disaster preparation initiatives. Yet, there is little information on these decision processes as they relate to disaster preparation. Chun (2008) looked at disaster preparation in a sample of California’s private 4-year HEIs. These private institutions often are classified under the collegial model. He found a wide range in preparedness, not surprisingly geared primarily toward earthquake hazards. Chun made recommendations that align well with the NIMS protocol, though NIMS compliance was not a specific aspect of his study. Lockwood (2005) noted that the most important reason why leaders do not take action after a disaster strikes elsewhere is denial, the “it will not happen here” attitude (p. 2). Mitroff et al. (2006) also asserted that denial plays a significant role in lack of preparation among HEIs, which may hamper efforts toward preparedness in the collegial institution.

**HEIs through the lens of bureaucratic/structural model/frame.** Birnbaum (1988) proposed the bureaucratic model of HEIs as characterized by the idea of the rational structure. Formal processes and hierarchy denote this model. In bureaucratic organizations, participants work under “lines of authority” or “lines of communication” (Bolman & Deal, 1997, p. 119) where information flows from the bottom up and directives flow from the top down. Participants respond to, and act within the context of, codified rules and regulations, which shape and guide behavior. Participants have little opportunity for participation in organizational decision-making.
Birnbaum suggested that the community college is the best example of a bureaucratic institution, though many institutions are likely to have some bureaucratic processes.

Bolman and Deal (1997) propose the structural frame, which is similar in concept to Birnbaum’s (1988) bureaucratic model. In this frame, rational structure is the foundation for the management and interaction of organizations. According to this frame, organizations exist to “achieve established goals and objectives” (Bolman & Deal, 1997, p. 40). Behavior is constrained by knowledge and skill, and by the organization’s partitioning through job descriptions, functions, procedures, and rules. Problems and inefficiencies are solved through reorganization, since they are perceived to be associated with structural deficiencies.

Rules and rational behavior might enhance disaster preparation in the bureaucratic institution, provided the previous adoption of a preparedness initiative. Yet, Jenkins (2008) reported that, as of 2007, only 7.4% of a residential community college sample in Texas had fully implemented disaster preparedness planning. These public institutions often are considered bureaucratic in nature. This might indicate that some other issues are at play in HEI preparedness and compliance.

**HEIs through the lens of political/political model/frame.** Birnbaum (1988) proposed the political model as characterized by the notions of coalitions and negotiated agreement. Limited resources, multiple objectives, and multiple stakeholders denote the political model. This results in impromptu coalitions forming around various and competing interests. In political organizations, participants work under a “conflict is inevitable” (Birnbaum, 1988, p. 133) natural outcome. Participants respond to, and act within the context of, authority, power, and influence that are diffused throughout the organization. Behavior shaping happens through a combination of social norms, rational procedures, and interaction between often-disparate
groups. Organizational decisions are made through negotiations and coalition building, regularly regarding the allocation of limited resources. Birnbaum suggested that the regional state university is the best example of a political institution.

Bolman and Deal (1997) propose the political frame in a similar way to Birnbaum’s (1988) political model. In this frame, coalition building and power distribution drive competition for limited resources. According to this frame, symbiotic alliances form around the partially synchronized interests among internal groups. While they often have different interests, the groups depend on one another for support. Yet, the disparate interests between these groups often generate conflict, a natural condition of political organizations. Within the bargaining and negotiation process, power becomes the most important resource for making things happen.

The potential for inefficiency due to distributed power within political institutions may cause delays in developing compromises that lead to active disaster preparation initiatives. Lack of consensus among the powerful stakeholder groups (e.g., faculty factions, administration, the board of trustees, state and federal actors) may inhibit progress toward preparedness. No research is available on disaster preparedness that has utilized a political lens to make sense of findings.

**HEIs through the lens of anarchy/symbolic model/frame.** Birnbaum (1988) proposed the anarchical model as characterized by three notions: problematic goals, unclear technology, and fluid participation. Issues of interpretation and “meanings” (Birnbaum, 1988, p. 172) denote this model. In the organized anarchy, participants work under limited or bounded rationality; they are unable to respond to, or participate in, the immense number of competing active elements within the institutional environment. Subgroups may exist within the larger structure, but they do not typically operate as coalitions. Participants coalesce in metaphorical receptacles
where a mix of problem and solution streams meet to form a choice, or decision, point. Apathy abounds in this environment, and chaos is not an unfamiliar concept in the organized anarchy. It often appears that no one specific person or group is responsible for the institution. The process morphs depending on the nature of the participants and their interest in specific issues. Birnbaum suggested that state flagship universities are the best example of the organized anarchy.

Bolman and Deal (1997) propose the symbolic frame which has some parallels to Birnbaum’s (1988) anarchical model. In this frame, interpretation and meaning illuminate issues surrounding organizational operation such that much of the importance of what happens lies in what it means. According to this frame, paths must be available to minimize the impact of the ambiguity and uncertainty that exists in organizations, which cause deterioration in rational processes. The symbolic frame focuses on what is expressed through processes and events rather than what might actually be concretely produced.

The sheer size and diversity of the organizational environment in an organized anarchy might play a pivotal role in disaster preparedness. In an effort to develop disaster preparation plans and protocols at an anarchical/symbolic institutional, higher education leaders might use disaster photographs and stories as symbols of the need for action. No research is available on disaster preparedness that has integrated a perspective on the anarchical/symbolic aspects of HEIs for making sense of findings.

While the study of organizational theory may result in intellectual constructs for understanding organizational behavior under the complex dynamics of disaster preparation, it does not provide a clear understanding of why different institutions might have differing levels of preparation. Farber (1982) noted that there exists a difference in organizational structure and
preparation, saying that, “… reactions to a particular disaster vary quite considerably… from organization to organization” (p. 19). Since the U.S. Government is moving to standardize disaster preparation across the spectrum of both public and private entities, it is timely for the discussion to take up the topic of NIMS and its application to higher education.

**NIMS Genesis and Progress**

**NIMS Background**

This subsection incorporates a discussion on the evolution and framework of NIMS. More specifically, it examines NIMS precursors, NIMS development history, and the NIMS component structure. Next, it considers NIMS in the context of previous HEI disaster research. Finally, the section examines the relevance of NIMS to higher education, demonstrating why it is appropriate for administrators to consider a broad standard like NIMS for application to the college and university environment.

**NIMS Precursors.** In the late 1960s, firefighting services in California had developed a new standard of command and control in the operations of actual fire emergencies. This standardization was the Incident Command System, or ICS (F. Edwards, personal communication, June 6, 2010). Chun (2008) noted that ICS, originated as a result of organizational problems, such as ineffective communications, lack of accountability, and undefined command structure during the response to wildfires in the 1970s. ICS was created to address different emergency response organizational structures, incompatible communications, unclear lines of authority, lack of reliable incident information, and terminology differences among agencies (p. 30), concepts that would later become part of the NIMS bedrock. FIRESCOPE became the parent organization for the ICS concept in about 1973. By 1980, the federal government had developed
the National Interagency Incident Management System (NIIMS), sponsored by the National Wildfire Coordinating Group (NWCG), and similarly was based on the wildland fire perils of Southern California (National Center for Security and Preparedness, 2009). NIIMS was not an all hazards approach to emergency management, and was not well received by practicing emergency management professionals. By 1993, the Standardized Emergency Management System (SEMS) was started in California, and “brought the ICS concept indoors from the field” (F. Edwards, personal communication, June 6, 2010). Previously, ICS had only been applied in the field, not from planning and theoretical perspectives.

One of the County of Los Angeles Office of Emergency Management Department Orientation documents (LACOA); (LACOA, 2007) indicates that SEMS “has been part of the established system for emergency management processes in California since 1996, and is still in use today, along with NIMS” (p. 1). The Department suggests that in California, NIMS will be integrated into SEMS. NIMS is the current instantiation of the ICS to NIIMS to SEMS progression, but at the national level, and was modeled on SEMS (LACOA, 2007).

Still prior to the development of NIMS, the Disaster Mitigation Act of 2000 was signed into law on October 30, 2000. “This law encourages and rewards local and state pre-disaster planning, promotes sustainability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening statewide mitigation planning” (FEMA, 2003, p. 14). FEMA came under the DHS in March of 2003, the year that NIMS was formally developed.

In 2004 the 9/11 Commission asked the American National Standards Institute, through its Homeland Security Standards Panel (ANSI-HSSP), to develop consensus on a National Standard for Preparedness, to improve preparedness in the private sector (National Commission
on Terrorist Attacks Upon the United States, 2004). This resulted in ANSI’s adoption of the Standard on Disaster/Emergency Management and Business Continuity Programs (NFPA 1600), in a voluntary capacity.

**NIMS History and Development.** Due to the ever-increasing complexity of systems and organizations, the modern requirements for disaster preparation and management are potentially huge. The behavior of many individuals and large amounts of resources might need to be coordinated in a crisis. This requires a protocol broad enough to handle a variety of agent specific incidents in different organizational structures, while at the same time detailed enough to handle the specific needs of unique incidents. It must be applicable to all-hazards situations, in order to provide a framework for which everything from training/practice to continuous improvement can be implemented, monitored, and evaluated.

These issues and others were driving the development of better disaster preparation processes. Jenkins’ (2008) research aligned with the above perspective on disaster coordination, and though he does not mention NIMS by name, he supports NIMS concepts by noting that disaster plans

must be widely accepted, understood and followed by the members of the organization.

Second, the plan must be all-encompassing with regards to potential hazards as well as applicable to diverse organizational locations…, however, crisis plans and programs cannot be maintained without regular training on and testing of those plans. (p. 15)

An important point noted by Schneider (2002) was that emergency management must cease being reactive and become proactive. Thus, disaster mitigation processes are “best realized when they result in a shift from a disaster-driven system to a policy- and threat-driven system of emergency management” (Schneider, 2002, p. 142). Perry and Lindell (2003) raised the issue of
inter-organizational coordination in response to disaster. Wilson (1992) spoke clearly on this stating that the development of better working relationships with external organizations and groups is critical, but particularly important with groups such as university boards of trustees, the surrounding community, and law enforcement organizations. (p. 167)

Chun (2008) noted that this creates new requirements for understanding other organizations’ missions, crisis plans, capabilities, etc. in order to work in a seamless manner during a crisis.

Underlying these issues of complexity in disaster preparation is the deficiency in awareness and understanding of the state of general preparedness in America and the lack of standardization in what preparedness means. To help rectify this issue, and to bolster the emergency management discipline by providing for interoperability and compatibility between federal, state, local and tribal actions in emergency situations, the federal government has embarked on the lengthy process of developing preparedness guidelines for a nationally consistent response to a wide range of hazards that could occur. President George W. Bush (2003) initiated the process to achieve this through HSPD-5 issued on February 28, 2003.

HSPD-5 directed the Secretary of the DHS to implement NIMS.

NIMS provides a core set of concepts, principles, and terminology developed into a set of guidelines based on the NFPA’s (2010) Disaster/Emergency Management and Business Continuity Programs standard, (2010). This standard began as the Recommended Practice for Emergency Management, after the NFPA Standards Council established the Disaster Management Committee in 1991 and the committee presented their work to the membership for adoption in 1995. In the year 2000, the document transitioned from a recommended practice to a
standard. It was at this time that the committee began to take a “total program approach” (NFPA, 2010, p. 1).

Over the course of the next few years, the committee updated the document to reflect standardization within its editorial formatting and presentation, as well as developed the outline for disaster/emergency management and business continuity. The most recent version, written in 2010, reflects continued development in conjunction with FEMA to include prevention as a specific aspect of emergency management, paralleling it with related disciplines.

NIMS as a component of a college or university’s emergency management plan speaks directly to Farber’s (1982) criticism of disaster planning in HEIs, namely the need to provide clear channels of authority and a sense of purpose and direction during an incident. As such, NIMS can determine the atmosphere and approach for the overall operation of the institution during a disaster. More specifically, it can determine the manner in which the constituents of the institution assume their respective roles and responsibilities, as well as set the tone for an appropriate institutional response. The NIC had left it to the states to adopt the NIMS standard voluntarily (FEMA, 2007). Johnson (2007) indicated that states are requiring disaster preparation in state HEIs, and have issued directives to state run colleges and universities to implement NIMS under direct orders from the Governor’s office. More recently, the DHS has placed regional coordinators to help states with NIMS compliance, a requirement for the receipt of federal preparedness assistance. Yet, it remains unclear how many institutions have become compliant with the NIMS implementation directives in their states. Further, there are no quantifiable measures of private institutional compliance with the NIMS directive, since, thus far, due to the inherent differences between public and private institutions, NIMS compliance has been primarily directed toward public institutions.
NIMS Structure. The goal of the NIMS protocol is broken into four major concepts: mitigation/prevention, preparation, response, and recovery. However, the NIMS outline was developed to provide a solution for implementing these concepts and is presented by component breakout, rather than under the four major headings. It is well documented in FEMA’s web presence. As of this writing, the December 2008 version is the most recent one available through FEMA. Standardization within the realm of flexibility is an important part of the NIMS model in order to provide application to all hazards situations within the individual incident realm. To this effect, “NIMS is not an operational incident management or resource allocation plan. NIMS represents a core set of doctrines, concepts, principles, terminology, and organizational processes that enables effective, efficient, and collaborative incident management” (FEMA, 2008, p. 3).

The five main components in the NIMS outline are preparedness, communication and information management, resource management, command and management, and ongoing management and maintenance. The first of these, preparedness, includes activities that take place prior to an incident on an ongoing basis. The nature of preparation emphasizes preplanning. This preparation integrates “assessment; planning; procedures and protocols; training and exercises; personnel qualifications, licensure, and certification; equipment certification; and evaluation and revision” (FEMA, 2008, p. 7).

Communication and information management play an important role in the incident response activity associated with a disaster. They must “provide a common operating vision to all command and coordination sites” (FEMA, 2008, p. 7). NIMS standardized the communication and information management requirements needed to develop the structure associated with creating a common operating perspective. This component of NIMS emphasizes
“the concepts of interoperability, reliability, scalability, and portability, as well as the resiliency and redundancy of communications and information systems” (FEMA, 2008, p. 7).

Resources, in the form of personnel, equipment, and/or supplies are required to support critical incident objectives. The management of those resources including their flow requires a malleable approach to be adequate for the needs of a given incident. “NIMS defines standardized mechanisms and establishes the resource management process to identify requirements, order and acquire, mobilize, track and report, recover and demobilize, reimburse, and inventory resources” (FEMA, 2008, p. 8).

The command and management component plays an important role in NIMS to provide a foundation for “effective and efficient incident management and coordination by providing a flexible, standardized incident management structure” (FEMA, 2008, p. 8). This foundation provides the necessary structure for three key organizational constructs: the Incident Command System, Multiagency Coordination Systems, and Public Information.

The NIC, using support technology, oversees the ongoing management and maintenance of NIMS. This includes periodic discussions between agencies on the federal, state, and local levels, and includes nongovernmental organizations in the private sector. Through this interaction, the NIC develops compliance criteria and implementation activities, and “provides guidance and support to jurisdictions and emergency management/response personnel and their affiliated organizations as they adopt or, consistent with their status, are encouraged to adopt the system” (FEMA, 2008, p. 8). The NIMS components undergo routine maintenance and evaluation for continuous refinement under the supervision of the NIC.
NIMS and Previous Studies

The previous work dealing with preparation for disaster events, as reported by Chun (2008), Jenkins (2008), Osburne (2008), and others do not specifically address the NIMS protocol as a national standard for preparedness. To be sure, these previous studies do provide some measure that is closely related to the NIMS protocol, including components of the four major NIMS sections, namely prevention, preparation, response, and recovery. Other studies, including Aschenbrener (2001), Farber (1982), and Johnson (2007) qualitatively examine the aftermath of disasters and institutional response.

One of the studies did mention NIMS in a peripheral way. Chun (2008) looked at the indirect role of SEMS/NIMS in crisis planning at private residential college campuses in California. He discussed the SEMS/NIMS history, and talked about the auxiliary part that they play in disaster preparation at these institutions. More specifically, Chun reported on the perception in several of the institutions he surveyed that NIMS compliance was required for disaster expense reimbursement, thus providing some impetus toward conformity. He noted that at least three institutional representatives indicated that reimbursement funding was contingent on compliance.

None of the previous work examined preparedness compared to a national standard. This study, therefore, fills a gap in the literature comparing HEI preparedness to an objective standard as developed by the DHS and adopted by the ED. This opens the door to examine whether particular variables or factors might be associated with NIMS compliance in HEIs. The next subsection describes the factors that will be tested in this study, to see if they might be associated with NIMS compliance.
Application to the Variables

Institutional Factors and NIMS Compliance

The study used institutional context variables to examine the relationships of those variables to disaster preparedness in HEIs. This section is an examination of the relationship of NIMS compliance to the study variables, for integrating theoretical concepts with the variables to establish their use as viable indicators of institutional NIMS compliance.

Organizational governance. Farber (1982) pointed out that HEIs are unique organizations due to the nature of their distributed governance and shared authority. A number of authors have suggested that organization and governance, central concepts in the literature on the topic of higher education leadership, have important implications for preparedness in HEIs. Jenkins (2008) noted that, “there are a limited number of articles written on the effect that an institution’s culture has on that organization’s preparedness for crisis and/or emergency situations” (p. 7). Padgett (2006) argued that disaster preparedness required a shift in organizational operation, and that this shift must begin with the institution’s senior leadership. According to Mitroff et al. (2006), these leaders must overcome the “this could never happen on our campus – we have a different situation” (p. 67) mindset. Padgett (2006) indicated the importance of upper administration’s role in that process through disaster team development and good communication. Farber (1982) and Wenger (1978) noted that emergency management capability might be related more tightly to organizational composition than to real-world disaster experience.

Jenkins (2008) surveyed Texas community colleges to collect perceptions about the extent that some specific factors might cause institutional administrators to initiate crisis
planning and preparation at their respective institutions. Institutional culture was one of the specific factors for which Jenkins surveyed. Jenkins found that

69.1% of the respondents agreed or strongly agreed to the statement: The culture of our institution has played a major role in influencing appropriate personnel at my institution to develop our current crisis preparedness level. However, 82.8% of respondents who had agreed to the statement that their institutions were prepared for crisis situations also agreed that organizational culture influenced the preparedness levels that their institution.

(p. 64)

This finding suggests that organizational governance may indeed be indicative of compliance with the NIMS protocol. In light of this information and the comments from other researchers, it makes sense to examine the relationship between organizational governance and disaster preparation in HEIs.

**Previous disaster experience.** There are mixed results in the literature to date as to whether previous disaster experience affects disaster preparation at HEIs. Farber (1982) and Wenger (1978) noted that emergency management capability might be related more with organizational composition than with real-world disaster experience. However, Wenger suggested that the level of disaster preparedness likely was correlated to previous disaster experience. Farber refutes this premise suggesting that “empirically [disaster preparedness and experience] vary independently” (p. 22). He did agree that “they are conceptually related, and both seem to be positively connected to an effective organizational response” (p. 22). Jenkins (2008) made a point in support of Farber’s, however. He suggested the basic assumption that those institutional leaders within close proximity to, or with first-hand knowledge of, disaster experiences at other institutions would be more likely to engage in disaster planning at their own
institutions, does not hold. He noted that the “it cannot happen here” denial mentality as being the top reason that organizations lacked preparedness. Mitroff (2005) suggested that previous disaster experience positively influenced preparation, which supports Wenger. Jenkins’ (2008) study of Texas community colleges regarding the degree that specific factors might cause institutional administrators to initiate crisis planning and preparation at their respective institutions is also informative. Previous disaster experience was one of the specific factors for which Jenkins surveyed. Jenkins found that

52.4% agreed or strongly agreed with the statement: Crisis events occurring at my institution in the past have played a major role in influencing appropriate personnel at my institution to develop our current crisis preparedness level. For individuals indicating that their institutions were indeed prepared to respond to a crisis situation, the percentage of respondents agreeing that past crisis events had an influence rose to 65.5%. (p. 65) He continued:

The fact that only 52.4% agreed or strongly agreed that prior crisis events at their institution influenced current preparedness levels may suggest that crisis events have not occurred at many of the represented institutions or that survey respondents simply had no knowledge of past events. (p. 66) Mitroff and Anagnos (2001) clearly stated that institutions are only prepared for what they have previously experienced, as described here.

Our first major finding was that the surveyed colleges and universities were generally prepared only for those crises that they had already experienced. In other words, they do not follow the best-practice model of crisis management that has been identified in the corporate world…. (p. 65)
Farber (1982) spoke to the issue of previous disaster experience of the institution’s primary leader as a potential indicator of preparedness, when he noted that a couple of presidential changes occurred at one of the institutions he studied following a major disaster. Farber implied that since both new presidents were external hires, and thus did not experience the disaster at the institution, there was not the driving impetus to develop a disaster plan, and little was done. Yet, more planning and preparation was accomplished by administrators at another institution he studied having experienced the same disaster.

This suggests that previous disaster experience may indeed be potentially associated with NIMS compliance, or at least is worthy of exploration in a study. In light of this information and the comments from other researchers, it makes sense to examine the relationship between previous disaster experience and disaster preparation in HEIs.

**Institutional size.** There is almost no mention of institutional size as it relates to disaster preparedness. Wenger (1978) conjectured that the level of disaster preparedness was correlated more with system size and organizational complexity. Farber (1982) suggested that the level and value of disaster preparedness at an institution might be more likely related to institutional size. Speaking directly to the issue of institutional size as an indicator of preparedness, Farber stated,

> In respect to physical resources, a larger institution with buildings and facilities spread out over a greater area… [their disaster plans] were expedited, in part by the need for better communication and coordination of emergency efforts throughout all segments of the campus. Size is thus seen as an element which influences the creation of contingency planning. (p. 167)

Farber examined two case studies qualitatively to arrive at this conclusion. Hartzog (1981) noted that size was significant in his study, but did not have a persistent effect across the planning
process at the institutions he studied. This suggests that the literature might benefit from an analytical approach to evaluating the size of an institution and its preparedness level.

Since research on the size of an institution and disaster preparedness is scant, these comments indicate that it is reasonable to attempt an assessment of institutional size as an indicator of compliance with the NIMS protocol. This information might shed light on these comments and provide a foundation for future work.

Legal representative on the disaster planning team. The idea of including legal counsel on the disaster preparedness planning team is not well researched. However, experts have commented on the subject. Ernst (2006) exhorted to “involve your legal counsel in the planning stage. Have your legal team review your plans. They can help anticipate challenges and legal questions that may arise” (p. 39). Pearson and Mitroff (1993) noted that in the best cases, membership on such teams includes all functions and specialties required to deal with crises, such as the CEO and top executives from operations, legal, human resources, management information systems, security and safety, environmental health, public affairs, and finance. (p. 54)

Hutchens, Annulis, and Gaudet (2008) affirmed the notion that a legal representative should be on the planning team for disaster management.

A single example of previous work was found that contained information on the extent of legal representation on a disaster planning committee. Mitroff et al. (2006) established that legal counsel was not well represented on crisis management teams in HEIs, which they noted as a surprising finding. They found that of all the major participants on the planning team, the legal advisor was present the least frequently of all participants at 66%.
Since legal cases and issues bubble up to create change that eventually settles out in the policies and practices of the HEIs, it is important to investigate what role legal counsel may play in the extent of compliance in disaster planning at HEIs. As discussed earlier in this chapter, the legal implications of disaster preparation in the post-duty era are significant. As such, it would make sense that legal counsel participation on disaster planning teams could impact preparedness, and thus compliance.

**Institutional sector: Public vs. private.** Two institutional studies have been done that are specific to a particular institutional sector. Chun (2008) surveyed crisis planning at private residential campuses in California. His qualitative study evaluated important aspects of disaster planning and the development of those plans. He indicated that all institutions in his survey had some form of disaster preparedness planning in place, although he found that varying preparedness levels existed among the private HEIs he surveyed. He did indicate that the threat of disasters was the biggest impetus for these institutions to prepare.

The only potential preparedness issue associated with these institutions being private was the recognition by three of the institutions that there might be a risk of forfeiting governmental reimbursement funds for private institutions that are noncompliant with governmental disaster preparation mandates. Three of the institutional representatives interviewed perceived that NIMS compliance was a prerequisite for disaster relief from FEMA. Chun (2008) did not provide verification of this as a FEMA requirement.

Jenkins (2008) surveyed public residential community colleges for disaster preparedness. The purpose of his qualitative study was to evaluate preparedness levels and the perceptions of administrators in assessing preparedness levels at their respective institutions. He reported that
approximately “20% of the institutional leaders in Texas community colleges had adequately prepared their institutions” (p. 67) for potential disasters.

Currently, NIMS compliance is not a requirement for general educational funding in public institutions. This may partially explain Jenkins’ (2008) results. Yet, NIMS compliance is a requirement for the Emergency Management for Higher Education (EMHE) grant program funding through the United States ED. Considering that private institutions generally have less government interaction and oversight, it appears that the type of institution, public versus private, may influence the outcome of preparedness efforts by institutions.

**Composite economic loss by state.** Mitroff (2005) noted that the cost of crises, in financial terms, is severe. This is certainly true for HEIs in the United States. The 1997 Red River flood in North Dakota caused damage to three state universities exceeding $200 Million (Aschenbrener, 2001). The total damage to California State University at Northridge from the 1994 temblor was in excess of $400 million (Finlay, 1999). Physical and economic losses to colleges and universities from Hurricane Katrina totaled an estimated $2.5 billion (IACLEA, 2006). There are many more institutions that could be listed here.

The probability of certain disaster types happening in different areas around the United States is not equal. For example, hurricanes are atypical for Utah (U.S. Geological Survey, 2005), and earthquakes are atypical for Wisconsin (U.S. Geological Survey, 2006). Certainly, this does not mean that Utah is completely immune to hurricane remnants, or that Wisconsin will never experience an earthquake. But it is important to understand something about the differing risk for the sample institutions from around the country, since they do not all face the same perils.
An indication of disaster risk for the states might be gleaned from the financial loss suffered by the individual states due to disasters, over a period of time. This could be helpful for balancing the study, since institutions with lower risk of disasters might not tend to apply resources to disaster preparation. Intuitively, it would appear that institutions in states with higher financial loss due to disaster, and thus likely facing higher risk of experiencing disaster, would be more likely to be NIMS compliant. Thus, the propensity for disaster in a particular state may influence the outcome of preparedness efforts by institutions within that state.

**NIMS Application to Educational Institutions**

NIMS is a generic approach to disaster preparedness that focuses on communities, cities, counties, states, and the country as a whole. Is a broad standard such as NIMS applicable in the unique environment of American HEIs? If so, it is important to examine and understand why it is applicable at the institutional level on college and university campuses across the country.

Mitroff et al. (2006) noted that, irrespective of the central mission of academic institutions, “colleges and universities are really like cities in the services they must provide and even some of the businesses they are in” (p. 63). Though not all institutions provide all services, these may include food services, hotel services, retail services, sporting event and entertainment services, healthcare services, and so forth, depending on the particular venues associated with the institution. Ketterer, Price, and McFadden (2008) suggest that HEIs “must be viewed as a unique community requiring response and recovery planning at multiple levels” (p. 5). FEMA’s (2003) Disaster Resistant University Report concurs with both of these, noting that “[h]igher education institutions are themselves communities in many ways, and they can draw on important lessons from the efforts of counties and municipalities to reduce disaster risks” (p. 1).
Bickel and Lake (1999), discussing the transformation of the legal environment surrounding the American academy, state that institutions, “were reconfigured to be more like governmental agencies—more like cities and towns” (p. 42). Yet, at the same time they indicate that the, “university is not a government, nor is it a typical business (e.g. manufacturer)” (p. 107). In addition to its other aspects, NIMS is designed for interoperability, defined to mean seamless interaction and communication; operational perspectives that an institution will rely on and require in order to interface with other support services during an incident. Therefore, this shows that the institution is capable of operating in much like a municipal organization, and that the idea of applying NIMS to higher education is well grounded.

Osburn (2008) suggested that, “[i]nstitutions, like communities and other organizations, may benefit from adoption of an ‘all-hazards’ model in which numerous risks and vulnerabilities are considered and anticipated in the context of a disaster or crisis preparedness portfolio” (p. 26). Although HEIs have similarities to these other organizations, they remain fundamentally different from municipalities and businesses. Yet, the above perspectives point to the ability for institutions to be able to use plans and models based on these other entities, noting that there are likely applicable differences that result within the institutional setting.

Summary

As previously stated, there was no real disaster preparedness practice in place at HEIs for many years. Disaster preparation research is relatively new, in general. HEIs are susceptible to both natural and manmade disasters. They have unique attributes, as compared to businesses, that may complicate their disaster preparation development activities. Yet, the legal environment is pressuring institutional compliance with preparation. Several factors might be associated with NIMS compliance in HEIs, including organizational governance, previous disaster experience,
institutional size, legal representation on the disaster planning committee, institutional sector, and composite economic losses in individual states.

As shown in the next chapter, this study sought to quantitatively evaluate these factors for connections to NIMS compliance in a variety of HEIs. Osburn (2008) noted that while the literature does provide a couple of potential models for developing disaster prepared HEIs, it does not provide any mechanisms or instrumentation to evaluate preparedness plans at HEIs. He asserted that institutions would benefit from the development of assessment tools to provide for the evaluation of institutional disaster plans and procedures. Such tools would provide important feedback paths to strengthen the efforts already in place across higher education, as well as a foundation for further research. Thus, this dissertation fills a gap in the literature and provides a potential means of informing practice.
CHAPTER 3

METHODOLOGY

As previously described, the purpose of this study was to investigate one aspect of disaster preparedness within U.S. higher education to establish a snapshot of readiness levels using NIMS compliance. More specifically, the study sought to investigate factors that may explain the degree of NIMS compliance in place at American HEIs. Guided by these overall purposes, the following were the study’s research questions:

1. How prepared are U.S. colleges and universities for disasters?
2. What influence do particular organizational and institutional context factors have on all-hazards emergency management preparedness at U.S. colleges and universities?

This chapter presents the methodology used in the study, including details on the study population and sample, the data collection procedures, the variable operationalizations, and the statistical analysis on the data.

Study Design

The study used a quantitative mode of inquiry. It was a retrospective, non-experimental design, using a scientific approach that utilized archival data (McMillan & Schumacher, 2001). However, supplemental data collection was needed to gather a few pieces of information that were not archival in order to fully answer the research questions of interest. Since the study sought to explore and explain the relationships of selected factors with NIMS compliance in
HEIs, scores for both the independent and dependent variables were used in a multiple-regression model. The study was derivational in nature, since it used sampled data on both the dependent and the independent variables to develop the regression equation.

Sample

According to the National Center for Education Statistics (NCES) (2009), there are 4,350+ higher education institutions in the United States. An examination of the Carnegie Foundation for the Advancement of Teaching’s (2010) basic classification revealed that there is substantial variety among the institutions that make up the American higher education enterprise. It is precisely due to this variety in the population that the sample for the study had to be delimited. The delimitation was for both practical and logical reasons. First, the study had to be constrained in order to make it reasonable to accomplish. Moreover, the institutions chosen for inclusion in the study were selected based on their alignment with the organization and governance archetypes of Birnbaum (1988) and Bolman and Deal (1997). To accomplish this task, stratified random sampling was employed utilizing the 2010 Carnegie Classifications that best matched the four archetypes from among institutions maintaining regional accreditation.

Institutional Archetypes

The anarchical institution is most keenly embodied in the flagship state and private research institutions. These institutions have high levels of research productivity. For this reason, the institutions selected for inclusion were chosen from the research university category with the very high level of research activity distinction. The Carnegie Classification designates these institutions by the RU/VH: Research Universities (very high research activity) description. Often, these institutions are physically larger than those in the other categories, with larger student bodies. This grouping includes institutions awarding at least 20 research doctoral
degrees during the year the classification was updated, but excludes professional doctoral-level degrees, such as the JD, MD, PharmD, and DPT. Also excluded are special focus institutions and tribal colleges. There are 33 private and 73 public institutions in this category.

The political institution most closely aligns with the regional university. The Carnegie classification best-fit designation for these institutions is the *Master’s S: Master’s Colleges and Universities (Smaller Programs), Master’s M: Master’s Colleges and Universities (Medium Programs), and Master’s L: Master’s Colleges and Universities (Larger Programs)* descriptions. Since the traditionally political institution grew out of institutions like the normal schools from around the turn of last century, the focus of this group is both public and private institutions with strong roots in the preparation of educators. This was determined by the *Graduate Instructional Programs* categories within the Carnegie Classification, which focus the grouping specifically on education. This group includes institutions awarding a minimum of 50 master's degrees, but fewer than 20 doctoral degrees during the year the classification was updated. Also, excluded are the special focus institutions and the tribal colleges. These institutions were delimited to include student bodies between 3,000 and 22,000 students. There are 37 private and 79 public institutions in this category.

The collegial institution is reflected in the traditional liberal arts institution, like those that flourished from the beginning of American higher education. These institutions most closely align with the arts and sciences institutions in the Carnegie Classification called *baccalaureate colleges*, and are denoted by the *Bac/A&S: Baccalaureate Colleges–Arts & Sciences* nomenclature. This group includes institutions issuing a minimum of 10% of all undergraduate degrees as baccalaureate degrees, with less than 50 master's degrees or 20 doctoral degrees awarded. Excluded from this group are the special focus institutions and the tribal colleges.
These institutions were delimited to include student bodies with more than 200 students. There are 99 private and 48 public institutions in this category.

The bureaucratic institution is most uniquely embodied by the two-year associate-level school and the community college. The Carnegie Classification designates these institutions by the grouping of associates-level \textit{Assoc/Pub} and \textit{Assoc/PrivNFP}, where NFP is an acronym for \textit{not-for-profit}. There is great stratification within the public two-year category. Since the number of two-year and community colleges approaches nearly half of the entire population of HEIs in the United States, this group was delimited to institutions with enrollments of between 200 and 10,000 students. Schools with multiple campuses were not considered in this study, since there is no mechanism in place to look at how the multi-campus environment affects disaster preparedness. Using these delimiters, there were 15 private and 165 public two-year colleges in this category.

Clearly, no institution is of one single governance model/frame. Yet, the sample was selected to maximize the alignment of institutions when the organization and governance lens was superimposed, which provided an optimized link between the institutions and the categories. Institutions may exhibit a combination of organizational characteristics, rendering this approach less than perfect. However, assigning the dominant governance characteristic provided a practical schema to the theoretical archetypes, as developed by Birnbaum (1988) and Bolman and Deal (2008), and allowed the study to provide value in informing practice.

Additionally, since collegial institutions are predominately in the private sector and the balance of the institutions are predominately in the public sector, the sector data will not necessarily be numerically even across each archetype. However, the balance between sectors was approximately one third of the sample from the private sector, leaving the sample remainder
from the public sector. This provided some proportionality in sampling. Table 1 shows the randomized sample population’s stratification, as well as the number of institutions in each category.

Table 1

*Population and Sample Size*

<table>
<thead>
<tr>
<th></th>
<th>Private Population</th>
<th>Public Population</th>
<th>Totals</th>
<th>Private Sample</th>
<th>Public Sample</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal Arts Colleges (collegial)</td>
<td>99</td>
<td>48</td>
<td>147</td>
<td>18</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Research Universities (anarchical)</td>
<td>33</td>
<td>73</td>
<td>106</td>
<td>9</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>Regional Univ.’s (political)</td>
<td>37</td>
<td>79</td>
<td>116</td>
<td>9</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>Community Colleges (bureaucratic)</td>
<td>15</td>
<td>165</td>
<td>180</td>
<td>5</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>Totals</td>
<td>184</td>
<td>365</td>
<td>549</td>
<td>41</td>
<td>67</td>
<td>108</td>
</tr>
</tbody>
</table>

In order to maintain the ability to detect a significant effect, while minimizing Type II error, the sample size must be large enough to maintain statistical power (Cohen & Cohen, 2003). A common rule-of-thumb for maintaining generalizability in multiple regression analysis (MRA) suggests that sample size, $n$, in terms of the ratio of observations to independent variables, should maintain a minimum of five, yielding

$$5 \times \text{(Number of independent variables)} = n$$
Miller and Kunce (1973) reported a more conservative minimum of ten samples per criterion variable as appropriate for MRA sample size. The study employs eight criterion variables for the MRA. Therefore, in order to satisfy this MRA requirement, a minimum of (8 criterion variables) x (10 sample HEIs/criterion variable) = 80 sample HEIs would need to be randomly selected. However, for maintaining statistical power, an *a priori* analysis was done to determine if the sample size of $n = 80$ was adequate. The results of the power analysis revealed that the sample size prediction yields $n = 108$ (Soper, 2011). Choosing the more conservative value, the sample consisted of 108 institutions, made up of 27 each from the four archetypal groups. The total population size was 549 institutions, leaving $108/549 = 19.67\%$ as the sample size proportion.

### Procedures, Variables, and Operationalizations

This section describes the data collection procedures and the variables used for the study, as well as the variable operationalizations. This research employed a multi-source approach to data collection. Specifically, the archival data was drawn from multiple sources, both published and self-reported data on individual institutions. Additional information came from a brief, three-question email/phone inquiry. Therefore, this multisource data does not suffer from single-source bias within the selected and defined population.

#### Data Collection Procedures

The archival data were obtained from the sources noted in each variable operationalization section that follows. The data that could only be obtained via contacting specific institutions was collected via a simple three-question email/phone inquiry, as previously mentioned. These questions, elaborated on in the variable operationalization section, included:

- whether a legal representative was on the institutional disaster planning committee,
- whether the institution had previous disaster experience and, if so, how much, and
- what the current institutional NIMS compliance level was.

The questions were posed to the highest ranking emergency management/NIMS compliance/implementation individual at each of the campuses within the sample population. This person was identified via a preliminary examination of institutional websites to determine who had responsibility for the institutional emergency management enterprise and/or through contacting the institution. Once the appropriate institutional contact person was identified, an email or telephone call to that person was initiated. Responses were written down and entered into a statistics analysis program to determine the degree to which a given factor was indicative of emergency preparation compliance with NIMS. Appendix A details the questionnaire protocol.

**Independent Variables**

**Institutional Organization and Governance**

In an attempt to illuminate that differences in preparation might exist between institutions with different organization and governance characteristics, this study applied the Birnbaum (1988) and Bolman and Deal (1997) modelsrames to a subset of colleges and universities in order to reveal potentially new insights into disaster readiness and NIMS implementation in particular at these institutions. Adoption of a formalized and broadly accepted standard such as NIMS by HEIs might be influenced by the nature of their organization and governance context.

The institutional archetype variable’s nominal data were coded as categorical information. Since this was not a dichotomous variable, it could not be coded simply with a 1 or a 0 in the regression model and remain meaningful for interpretation. The procedure for a categorical variable with k categories is to transform it into the same number of dichotomous
variables as the number of degrees of freedom for the variable, that is, $k - 1$ dichotomous variables, where $k$ is the number of unique variable categories. Since there are 4 categories in the organizational governance model/frame variable, the result was that $(4 - 1 = 3)$ transformed variables were needed to make the operationalization. In this case, the variable was coded using *dummy coding* (Davis, 2010). The study design used the collegial model/frame as the organizational governance reference level from which to do comparisons. This design provided contrast between the reference level and the other three organizational governance types. Table 2 shows the variable operationalizations for the organizational governance variable.

Table 2

*Operationalization for Organizational Governance Structure*

<table>
<thead>
<tr>
<th>Frame/Model</th>
<th>Collegial-Structural</th>
<th>Collegial-Political</th>
<th>Collegial-Symbolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureaucratic/Structural</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Political/Political</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Anarchical/Symbolic</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Collegial/Human Resources</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: $n = 108$.

**Previous Disaster Experience**

The previous disaster experience variable (PREVDISEX) is continuous, and was operationalized as the previous number of disaster occurrences that have happened at a particular institutional campus. Mitroff et al. (2006) established a list of crisis situations that may occur on college and university campuses in their study. They used a moving window, i.e. whenever they sampled, they took a snapshot of the three previous years, thus the window moves. This study used this list over the three-year window. The data for this variable was obtained from an email
or phone inquiry. The interviewee was offered the list of incident types, and asked to indicate how many times each type of scenario actually occurred on their campus. Each disaster occurrence was scored as a 1 for a single event. These events were summed to form a cumulative value for the variable (Mitroff et al., 2006). The appendix details the questionnaire protocol.

**Institutional Size**

The institutional size variable (INSTSIZE) is continuous and was operationalized as the size of the student body at the particular sample institution. The archival data for this variable were collected from the Integrated Postsecondary Education Data System (IPEDS) from the Carnegie Classification for the Advancement of Teaching’s (2010) classifications (2010). Data for the fall 2010 were used.

**Legal Advisor on Planning Committee**

The legal advisor as a member of the planning committee variable (LEGALAD) is dichotomous, and represents whether an actual legal representative of the institution participated in the disaster and emergency management planning and training. Mitroff et al. (2006) established a list of potential institutional positions which might participate as members on a disaster planning team. The legal representative is one of the disaster planning committee positions they identified for potential membership on the committee. It is important to review the impact that legal representation has on disaster preparation in light of the changing legal climate in American higher education. Legal advisors noted the potential liability exposure that administrators and institutions open themselves up for in a lack of adequate preparation. Chun (2008) purported that “[p]otential liability claims may arise also from the absence of a crisis
plan, or inadequacy, or failure to follow the plan’” (p. 33). Hinckley (2006), Binder (2002), and Lipka (2005) agreed.

The data was coded as a 1 if legal representation was present on the committee and a 0 if no legal representative was on the planning committee. The data for this variable was obtained from an email or telephone inquiry. The interviewee was given a description of this institutional position that could potentially be a member on a disaster planning team, and asked to indicate if a person providing legal representation actually participated as a team member.

**Public vs. Private Sector**

The institutional sector variable (INSTSECTOR) is dichotomous, and represented whether an institution was public or private. The data was coded as a 1 for public and as a 0 for private. This archival data was collected from the Carnegie Classification (2010).

**Composite Economic Loss by State**

In an effort to illuminate some of the variance in NIMS compliance that might exist between institutions in different states, facing different perils in those states, this study used composite economic loss data from the Spatial Hazard Events and Losses Database for the United States (SHELDUS), developed by the Hazards and Vulnerability Research Institute (HVRI); (HVRC, 2011) at the University of South Carolina. SHELDUS, a county-level data set providing information on 18 different natural hazards, from hurricanes and tornados to earthquakes and wildfires, compiled disaster data from 1960 to 2009. As part of the SHELDUS database, a chart of economic loss for each of the states was compiled. The data is available on the HVRI website. This information is published in the form of pie charts depicting losses from the natural hazards specific to each state. These data were used as a proxy for state-level natural hazard risks. The SHELDUS data set has the advantage of leveraging statewide geographic data
against the measurement of the specific hazards particular to an institution and state, but with the added benefit of bringing a financial perspective to the study.

The composite economic loss variable (COMPECONLOSS) is continuous, and was operationalized as the total dollar loss due to natural hazard occurrences in a particular state, based on millions of 2005 dollars (USD). The composite economic losses for each state, including all perils in the state between 1960 and 2009, was used for this study by summing the damage loss over each of the individual perils affecting each state in order to build a composite economic loss score. Since this data represents economic losses incurred within the particular states, the data was normalized to account for the large discrepancies in both geographical and population sizes between states. To provide an areal weighting, the loss values were divided by the geographical area within the state. This provided a loss per square-mile normalization. Geographical area information was collected from the U.S. Geographical Survey. To provide a per-capita weighting for economic loss, the loss values were then divided by the average population within the state. The study used the average population over the 50-year data collection period to account for changes in state populations. This provided a loss per capita normalization. Population information was collected from the U.S. Census Bureau, and was an average of decennial census data. These actions provided meaningful values allowing direct and valid comparisons between the states.

**Dependent Variable**

**NIMS Compliance**

The dependant variable for the study is NIMS compliance (NIMSCOMP), which was used as a proxy for disaster preparedness. This variable is continuous and was operationalized as the ratio of the number of trained first responders to the total number of first responders at a
particular institution in the sample. NIMSCOMP was designed to be the same reporting statistic accepted by the NIC for use in the NIMSCAST system. The data are reported as a percentage of compliance (A. Flumen, personal communication, June 11, 2010).

The data for this outcome variable were obtained from an email/phone inquiry. A study participant was given a description of the DHS metric for NIMS compliance and asked to provide the institutional NIMS compliance score. The appendix details the questionnaire protocol.

**Data Analyses**

This study sought information about potential associations between the independent variables and the dependant variable. The results may inform the preparedness process by alerting both the funding agencies and institutions to issues surrounding the type of institutions that may fall behind in preparedness. It is not within the scope of this study to identify specific HEIs that are either performing well or performing poorly in preparedness. As such, no individually identifiable or institution specific information is revealed in the study results.

Both univariate and multivariate statistical analyses were used on the data for this study. For the purposes of answering research question one, descriptive statistics were generated and presented. Specifically, means, standard deviations, frequencies, and range values for each of the variables were calculated and described. Data coded in dichotomous and categorical formats were presented in frequencies as well.

Next, as it regards Question 2, regression analysis was used to investigate the variable relationships of interest. First-order data diagnostics were performed initially, however, to examine the potential for multicollinearity, which occurs when one or more of the independent variables demonstrates a linear dependence on one or more of the other independent variables.
(Lomax, 2001). Multicollinearity can lead to potentially unstable regression coefficients when independent variables are highly correlated (i.e., the variables are essentially measuring the same thing). The data was examined via visual inspection of the correlation matrix to determine if second-order diagnostics, such as variance inflation factors (VIF) and regression model pairs, were required to be performed. If high values are found (above .5) during an inspection of a correlation matrix among independent variables, multicollinearity can be more finely investigated via VIF calculations and through the use of regression model pairs that are entered and removed in different combinations to see if the regression results are substantively different.

Following this assessment, and prior to running the regression analysis, additional tests of the data suitability for regression analysis were conducted to verify the usefulness of the captured information. These tests were done to ensure that the assumptions of linear regression were not violated. Since multiple regression is a linear analysis, it shares all the assumptions of correlation, namely sampling from a Gaussian distribution, linearity of relationships, homoscedasticity, interval or near-interval data, absence of outliers, and data range that is not truncated (Lomax, 2001). Furthermore, tests of the data for outliers were conducted.

In any regression analysis, once it is clear that multicollinearity is not present, and the data are suitable for regression, the analysis can be run with confidence. Since multiple regression is a linear operation, it can be represented by an equation that takes on the form of a straight line, \( y = b_1x_1 + b_2x_2 + \ldots + b_nx_n + c + e \), where the \( b_n \)'s are called regression coefficients and represent the amount of variance contribution explainable by each of the independent variable coefficients. In other words, the \( b_n \) coefficient represents a contribution to the change in \( y \) corresponding to an integral change in the \( n^{th} \) independent variable. The \( y \) intercept, \( c \), is a constant (where the regression line intercepts the \( y \)-axis), representing the value of the dependent...
when all the independent variables are held at zero. The standardized version of the $b$ coefficient is a beta weight; the ratio of the beta coefficients is the ratio of the relative predictive power of the independent variables. The unexplained proportion of the variance is captured by $e$ in the formula. Associated with multiple regression is $R^2$, the percent of variance in the dependent variable explained collectively by all of the independent variables. This analysis indicates the variance in the dependant variable explained by the independent variables, using the adjusted $R^2$ analysis to account for multiple independent variables.

**Summary**

This chapter presented the methodological approach for the planning and execution of the study. It covered details on the study design, the sample population, the variable operationalizations, and the data collection procedures. The data analysis plan was also presented. The study findings are presented in Chapter 4, with a discussion of the findings presented in Chapter 5.
CHAPTER 4

RESULTS

This chapter provides a report of both the descriptive and inferential findings from the statistical analysis for the study. First, the descriptive results are developed. This includes means, standard deviations, and frequencies where applicable. The descriptive analysis provides a picture of preparedness for the sample institutions. Second, following a series of tests of the data for the appropriateness of multivariate regression analysis, the inferential results are presented. The regression analysis presents the relationships between the independent variables and the dependent variable NIMS compliance (NIMSCOMP). The discussion of the findings, as well as implications and recommendations, is described in Chapter 5.

Descriptive Results

This study sought information about disaster preparedness levels at colleges and universities in the United States. This section reports on the descriptive aspects of the collected data. Using NIMS compliance as a proxy for preparedness is the basis for determining preparedness levels in the sample population of this study \( n = 108; 100\% \) response rate. Table 3 shows the means, standard deviations, and range values for the four continuous variables used in the study. Since means for dichotomous variables are meaningless in this case, the other variables are omitted from the table. Frequency information for these variables is relevant, however, and is presented below.
NIMSCOMP, operationalized as the ratio of the number of NIMS trained first responders to the total number of first responders and used as a proxy for disaster preparedness, had a mean compliance level of 62.89% and a standard deviation of 32.91%. This indicates that the institutions in the sample had an average of just under two-thirds of their first responders NIMS trained in the arena of disaster preparedness. Furthermore, given the size of the standard deviation, combined with the fact that scores on this variable filled the full range possible (i.e., 0-100%), it is clear that there is considerable variation in preparedness within the sample; some institutions appear to be well prepared while other institutions appear unprepared for a disaster. Fifteen of the sample institutions reported 100% NIMS compliance, and 10 institutions reported that 0% of their first responders were NIMS trained.

Table 3

Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSCOMP</td>
<td>62.89</td>
<td>32.91</td>
</tr>
<tr>
<td>PREVDISEX</td>
<td>.42</td>
<td>.86</td>
</tr>
<tr>
<td>INSTSIZE</td>
<td>9811.70</td>
<td>11826.08</td>
</tr>
<tr>
<td>COMPECONLOSS</td>
<td>2321.91</td>
<td>3585.83</td>
</tr>
</tbody>
</table>

Note: $n = 108$

PREVDISEX, operationalized as the previous number of disaster occurrences experienced by a particular institutional campus in the past three years, had a mean occurrence level of .42 and a standard deviation of .86. This indicates that relatively few institutions have had disaster incidents in the last three years, suggesting that an average institution had .42 disaster incidents during this time period. The variability is .86 for the number of disasters experienced. Scores ranged from 0 to 5 disasters. However, only one institution in the sample
had a score of five disasters and only one had a score of four disasters, which equates to slightly less than 1% of the sample for each of these cases. Table 4 and Figure 3 below present the frequencies for previous disaster experience.

The vast majority of institutions in the sample indicated no previous disaster experiences as reflected in the list of 13 disaster types described in Appendix A. A total of 78 institutions, 72.2% of those surveyed, reported 0 disaster occurrences. In fact, 100 out of 108 institutions, 92.6% of those surveyed, reported 1 or 0 disaster occurrences in the last three years. This indicates that, while institutions are not immune to disaster, they are not continuously experiencing disaster occurrences either.

Table 4

*Previous Disaster Experience*

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>78</td>
<td>72.2</td>
<td>72.2</td>
<td>72.2</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>20.4</td>
<td>20.4</td>
<td>92.6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>3.7</td>
<td>3.7</td>
<td>96.3</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1.9</td>
<td>1.9</td>
<td>98.1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>.9</td>
<td>.9</td>
<td>99.1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>.9</td>
<td>.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3. Previous disaster experience frequencies.

The Table 3 entry for INSTSIZE (as measured by number of students) shows that the sample mean for institutional size and its standard deviation are 9,811 and 11,826, respectively. This descriptive finding suggests considerable variability in the size of the data points in the institutional dataset. Given the range in size of institutions in the United States and the four Carnegie classes selected for the study, this finding is not surprising but is nevertheless important to consider as it regards how institutional size may matter to NIMS compliance. There was one institution in the study that was markedly larger than all the others, and it turned out to be an outlier in the data. This detail is addressed later.

The mean for COMPECONLOSS is operationalized as the per capita average composite economic loss in 2005 dollars in each of the states for all disasters between 1960 and 2009 inclusive. This variable was selected as a proxy for the disaster related environment of a state,
grounding the metric in the geographical disaster related exposure that may be reflective of the disaster preparation in the institutions of higher education within a state. The mean for this variable and standard deviation were $2,321.91 and $3,585.83 respectively, suggesting considerable variability across states.

The first dichotomous variable, institutional organization and governance, was operationalized via the four models/frames discussed in Chapter 3 and linked to the four Carnegie Class types that equate to the archetypes of liberal arts colleges, research universities, regional universities, and community colleges. There was a 100% response rate from the institutions, so the planned institutional distribution in each cell was achieved.

The result for the second dichotomous variable, legal representation on the disaster planning and response team (LEGALAD) is shown in Table 5 and Figure 4. Of the sample, 74 institutions (69% of the sample) did not have legal counsel as an official member of their disaster planning team, and 34 institutions (31% of the sample) did have legal personnel to serve in this position.

Table 5

<table>
<thead>
<tr>
<th></th>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>74</td>
<td>68.5</td>
<td>68.5</td>
<td>68.5</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>31.5</td>
<td>31.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legal Advisor on Disaster Planning Team
Figure 4. Legal advisor on disaster planning team frequencies.

role. To summarize, a clear majority of the institutions in the sample appeared to feel that legal counsel on the disaster planning team was not critical.

The final dichotomous variable, institutional sector (INSTSECTOR), was the classification of an institution as public or private. Given the 100% response rate, the plans for the sample were realized. This provided a sample where 41 institutions were private and 67 were public, which mapped into the description of institutional types as presented in Table 1 of Chapter 3.

**Inferential Results**

While this study sought descriptive information about disaster preparedness levels in American colleges and universities via the first research question, it also sought to examine the relationships between institutional factors and preparedness levels as manifest in the second research question. To investigate these relationships, a multiple regression analysis was performed on the independent variables to see if any correlations surfaced between them and the
dependent variable NIMS compliance (NIMSCOMP). This section presents the results of that multiple regression analysis, prefaced by the exploration of the data for ordinary least squares regression suitability.

**Testing the Data Suitability for Regression Analysis**

Prior to performing the regression analysis on the dependent variable NIMS compliance (NIMSCOMP), first order diagnostics were executed to determine if collinearity was present in the data. Collinearity becomes a problem when one or more independent variables are linearly dependent on one or more other independent variables (Lomax, 2001). A correlation matrix was generated and examined for potential violations. A first step analysis is completed via visual inspection of a correlation matrix and is presented in Table 6.

Table 6

*Correlation Matrix of Independent Variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 INSTSISE</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 COMPECONLOSS</td>
<td>.157</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 COLLEGIAL-POLITICAL</td>
<td>-.188</td>
<td>-.088</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 PREVDISEX</td>
<td>-.106</td>
<td>.005</td>
<td>.177</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 LEGALAD</td>
<td>-.145</td>
<td>-.086</td>
<td>-.022</td>
<td>.013</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 INSTSECTOR</td>
<td>-.385</td>
<td>-.218</td>
<td>-.143</td>
<td>.008</td>
<td>.050</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 COLLEGIAL-STRUCTURAL</td>
<td>-.034</td>
<td>-.133</td>
<td>.532</td>
<td>.100</td>
<td>.158</td>
<td>-.284</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>8 COLLEGIAL-SYMBOLIC</td>
<td>-.740</td>
<td>-.146</td>
<td>.468</td>
<td>-.007</td>
<td>-.058</td>
<td>.148</td>
<td>.336</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*Note:* Dependent Variable: NIMSCOMP

Although correlation values larger than $\pm .8$ indicate potential for collinearity (Lewis-Beck, 1980), a useful rule of thumb is to visually inspect for any correlation larger than $\pm .5$. From the data shown in the correlation table, it is apparent that two of the correlations have
values larger than ±.5, indicating a potential for collinearity. The relationship between the organization and governance category collegial/symbolic (COLLEGIAL-SYMBOLIC) and institutional size (INSTSIZE), shows a correlation coefficient of -.740, and the collegial/bureaucratic (COLLEGIAL-STRUCTURAL) and collegial/political (COLLEGIAL-POLITICAL) organization and governance dummy variables have a correlation coefficient of .532, respectively. While it is unlikely that the second pair is a problem, since they are measuring two separate groups of institutions, the potential for collinearity in the first pair with a -.740 correlation coefficient is possible. Larger institutions tend to be of the anarchical/symbolic structure, leaving this relationship as a candidate for further examination.

As a result, however, all variables were checked using a second order tool, variance inflation factors (VIFs). The calculation for VIF is \(1/(1 - R^2)\), and since \(R^2\) typically ranges from 0 to 1, a VIF can vary between 1 and approaching infinity (recall that \(1/(1 - R^2)\) approaches infinity as \(R^2\) approaches 1, and dividing by 0 is undefined). Table 7 shows the results of the VIF calculations.

VIF values of approximately 1 are considered unlikely to produce collinearity issues. However, a VIF score above 10 is a strong potential indicator of collinearity. Since, once again, two of the variables produced results that were noticeably higher than one (3.86 and 3.45 respectively), although substantially under 10, further tests were run to determine if collinearity was present. The model was run with and without each of the suspect variables to ascertain the difference in results. No changes were found in the significance of the model with or without each of the suspect variables.
Table 7

Variance Inflation Factor Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLEGIAL-STRUCTURAL</td>
<td>1.802</td>
</tr>
<tr>
<td>COLLEGIAL-POLITICAL</td>
<td>1.717</td>
</tr>
<tr>
<td>COLLEGIAL-SYMBOLIC</td>
<td>3.856</td>
</tr>
<tr>
<td>PREVDISEX</td>
<td>1.122</td>
</tr>
<tr>
<td>INSTSECTOR</td>
<td>1.397</td>
</tr>
<tr>
<td>LEGALAD</td>
<td>1.222</td>
</tr>
<tr>
<td>COMPECONLOSS</td>
<td>1.103</td>
</tr>
<tr>
<td>INSTSIZE</td>
<td>3.449</td>
</tr>
</tbody>
</table>

Histogram

Dependent Variable: NIMSCOMP

Regression Standardized Residual

Figure 5. Plot of residuals with normal curve.
Figure 6. Plot of expected and observed probabilities.

Figure 7. Scatter plot of residuals for outliers.
Finally, histogram and scatter plots were generated to determine if the data were suitable for use in the regression analysis (Figures 4-6), looking for normality, homoscedasticity, and the potential impact of outliers. No suitability issues were found through this analysis. An outlier was found in the institutional size variable (INSTSIZE). The outlier was removed and the analysis was repeated without any significant change in results. Hence, all the data, including the outlier, was used for the actual regression analysis, and that is discussed next.

Regression Analysis

In the regression analysis, the stepwise option was chosen to examine independent variable contributions to the model and eliminate independent variables with little or no contributive power. This resulted in the elimination of all but two independent variables, institutional size (INSTSIZE) and institutional sector (INSTSECTOR). Table 8 presents the results of the stepwise analysis model, with the non-significant variables excluded, including the adjusted $R^2$-values, $F$-value, and $\beta$-coefficients.

Table 8

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Adjusted $R$-Square</th>
<th>$F$</th>
<th>Sig.</th>
<th>Standardized Coefficients (Beta)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INSTSIZE</td>
<td>.108</td>
<td>13.939</td>
<td>.000</td>
<td>.341</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>INSTSIZE</td>
<td>.142</td>
<td>9.888</td>
<td>.000</td>
<td>.281</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>INSTSECTOR</td>
<td></td>
<td></td>
<td></td>
<td>.214</td>
<td>.028</td>
</tr>
</tbody>
</table>

*Note: Dependent Variable: NIMSCOMP*
The results show that the final model explained 14.2% of the variance in the dependent variable NIMS compliance (NIMSCOMP). The adjusted $R^2 = .142$, and the $F$-statistic, at 9.888 (using the stepwise method), was significant at the $p = .000$ confidence level.

For multiple regression analysis with $p$ predictors and $n$ observations, with $p + 1$ parameters to be estimated (one regression coefficient for each predictor plus the $y$-intercept), there are $n - p - 1$ degrees of freedom for the error term. This accounts for the error degrees of freedom in an ANOVA table. Therefore, for the original model with eight independent variables, $n - p - 1 = 108 - 8 - 1 = 99$ degrees of freedom. For the revised model with two independent variables, $n - p - 1 = 108 - 2 - 1 = 105$ degrees of freedom. There are $p - 0$ or $p$ degrees of freedom for null hypothesis testing. This accounts for the regression degrees of freedom. Therefore, for the original model with 8 independent variables, $p - 0 = 8 - 0 = 8$ degrees of freedom. For the revised model with 2 independent variables, $p - 0 = 2 - 0 = 2$ degrees of freedom. This leads to parameters for indexing the $F$ table of $F_{8,99}$ for the original model, and $F_{2,105}$ for the revised model. Therefore, $F$ must be greater than 2.03 for significance in the 95% confidence interval for the original model, and 3.08 for the revised model.

Since the value for the $F$-statistic in the revised model was 9.888, and the threshold value for significance in the revised model is 3.08, the model achieved significance. This leads to a couple of important results from this analysis. First, the institutional size is significant in the study, standardized $\beta = .281$, $p = .002$. This means that for each standard deviation change in institutional size, preparedness increases by .281 standard deviations. Thus, the size of an institution appears to be positively correlated to preparedness, suggesting that larger institutions are more prepared than smaller ones. Second, the institutional sector appears to be positively correlated to preparedness, standardized $\beta = .214$, $p = .028$, recognizing that private institutions
were assigned a value of 0 and public institutions were assigned a 1 for this dichotomous variable. The result suggests that the institutional sector appears to be positively correlated to preparedness, and that public institutions are more prepared than their private counterparts.

Since institutional sector (INSTSECT) was significant as a predictor variable, the NIMS compliance scores were broken out via sector. Table 9 shows the comparison of the two different sector means for the sample data. This shows that there was nearly a 20-point spread between the means of the institutional sectors.

Table 9

<table>
<thead>
<tr>
<th>Institutional Sector</th>
<th>n</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>41</td>
<td>.00</td>
<td>100.00</td>
<td>50.366</td>
<td>34.437</td>
<td>1185.938</td>
</tr>
<tr>
<td>Public</td>
<td>67</td>
<td>.00</td>
<td>100.00</td>
<td>70.030</td>
<td>29.444</td>
<td>866.938</td>
</tr>
</tbody>
</table>

The other variables in the study did not produce statistically significant results. Organization and governance was coded as three dummy variable relationships, namely COLLEGIAL-STRUCTURAL, COLLEGIAL-POLITICAL, and COLLEGIAL-SYMBOLIC. None of these variables produced statistical results, indicating that there was no significant difference between the organization and governance types described by Birnbaum (1988) or Bolman and Deal (2008) as they relate to NIMS compliance. The previous disaster experience (PREVDISEX), composite economic loss (COMPECONLOSS), and legal representative on the disaster planning team (LEGALAD) variables were not found to be statistically significant. These variables were chosen to provide an indication of disaster exposure to institutions. None of them, however, appeared to play a significant role as a factor in NIMS compliance.
Additional Analysis for the Study

To supplement the research, and to potentially further nuance the issues affecting disaster preparation in HEIs, additional analyses were done. First, supplementary regressions were run removing each of the organizational governance types, one at a time. Additionally, regressions were run removing each institutional sector, public or private, one at a time. None of these additional analyses provided as good an explanation of variance, and most provided much worse predictions.

Second, since the emergency management function in HEIs frequently is housed under the financial umbrella of an institution, within the purview of a vice president of financial affairs or vice president of operations, two additional variables related to institutional wealth were added to the regression model and tested, institutional endowment (INSTENDOW) and research and development funding expenditures (ESRD). An endowment value for each institution in the sample was recorded from data located in the National Association of College and University Business Officers (NACUBO) (2010) survey of endowments. The research and development funding expenditures (ESRD) variable values were retrieved from the National Science Foundation (2009) Survey of Academic Research and Development Expenditures. This is a composite of R & D expenditures from all funding sources for each institution. Neither of these additional factors was found to be statistically significant.

Finally, two variable re-operationalizations were done to examine the effects on the regression analysis. Given the skew of the data for previous disaster experience (most had no experience), this variable was re-operationalized as a dichotomous one, namely an institution either had previous disaster experience of any level (coded as a 1) or it did not (coded as a 0). Additionally, composite economic loss was re-operationalized as the average yearly loss in a
particular state due to all disaster occurrences over the 50-year period between 1960 and 2009, normalized to 2005 USD. Supplemental analysis was done using these new variables individually. The findings did not prove statistically significant.

Summary

This chapter presented the results of the study. First, the descriptive results were developed, discussing the compliance with the NIMS protocol and the number of institutions that have legal counsel participating in disaster preparation. The average institution is 62.56% compliant with the NIMS protocol. The mean for public institution NIMS compliance is 70.02% and for private institution NIMS compliance the mean is 50.36%. Only 31.48% of institutions had a legal representative on their planning and response team, with 34 out of 108 institutions reporting that a legal counselor participated as a sitting member of the disaster planning team.

Second, the relationships between the independent and criterion variables were presented. Significance was found for two of the eight independent variables, institutional size (standardized $\beta = .281$, $p = .002$) and institutional sector (standardized $\beta = .214$, $p = .028$). The model explains 14.2% of the variance in the dependent variable NIMS compliance (NIMSCOMP). The adjusted $R^2 = .142$ and $F = 9.888$ (using the stepwise method) is significant at the $p = .000$ confidence level. The next chapter describes the findings, as well as implications and recommendations, followed by the study limitations linked to opportunities for future research, and ultimately the conclusion to the dissertation.
CHAPTER 5

DISCUSSION

Using NIMS compliance as a proxy for disaster preparation, the purpose of this study was two-fold: to evaluate disaster preparedness in a random sample of colleges and universities in the American academy, and to determine relationships between institutional factors and preparedness. Specific organizational, operational, functional, and financial factors were identified as potentially important indicators of variation in NIMS compliance for disaster preparation.

This chapter discusses the descriptive and inferential findings, framed by scholarship presented in the literature review. The chapter then describes implications and recommendations for institutional and governmental policy and practice. From there, the chapter shifts to a presentation of study limitations and opportunities for future research. The chapter concludes with summative reflections on the topic and its importance.

**Analytical Results Evaluation**

This section is presented as two supporting but connected parts of the investigation. It begins with an evaluation of the descriptive results from the analysis, including an assessment of the means and frequencies. It concludes with an examination of the regression results, by individual variable, within the context of the theoretical concepts of Chapter 2 and the literature that informed the research.
**Noteworthy Descriptive Results**

Two of the descriptive findings in Table 3 are especially noteworthy, the first focusing on NIMS compliance. A mean for the dependent variable NIMS compliance (NIMSCOMP) was determined from a random sample of 108 colleges and universities. The sample mean was 62.89%, which indicates that the average HEI has a 62.89% compliance rating with the NIMS. The variability of the NIMS compliance dependent variable was 32.91%, indicating a wide range of scores for this variable with the institutional results actually spanning the full range of possibility from 0 to 100%. Less than two-thirds compliance with NIMS is arguably lower than the DHS would like to see. An institution that truly embraces a higher NIMS compliance score is better able to deal with a host of issues, such as preparedness, interagency communication including disaster specific language, resource management, and incident command. Since the study uses NIMS compliance as a proxy for preparedness, the low NIMS compliance values would suggest that a number of colleges and universities are less than adequately prepared for disaster.

As a metric for preparedness, NIMS compliance is an attempt by the federal government to provide a framework within which to build a preparedness plan. The fact that more than a third of first responders at colleges and universities are not NIMS trained suggests that campuses are not fully prepared and the safety of those communities is at potential risk. Furthermore, a potential reason why compliance is measuring low is multifaceted. First, compliance has only been an expectation of the DHS since 2005. Confusion as to what compliance entails, what it costs, and whether it is even necessary may contribute to institutional complacency. Additionally, general institutional inertia may slow progress toward achieving higher levels of compliance. Furthermore, although private institutions are expected to comply with extensive
governmental regulations, the relationship between these institutions and the government is more loosely-coupled than that of public institutions. Simply put, public institutions have greater accountability to government mandated policy regulations through the state education appropriation funding process. From previous discussions in Chapters 2 and 3, it is also important to recall that 100% compliance is not expected given the realities of employee/personnel turnover and attrition, though it was interesting to note that 15 of the sample institutions (13.9% of the sample) reported 100% NIMS compliance.

The second noteworthy finding was previous disaster experience (PREVDISEX). The average institution had less than one previous disaster (.42) during this time period. However, eight of the 108 institutions in the sample had 2 or more disasters, with one institution having four and another one having five disasters. The majority of institutions, 78, had no disasters at all. It must be noted that many of the reported disasters were snow emergencies causing a temporary suspension of campus activities. These situations were classified as emergencies because the institution initiated a response by activating a command center. What is interesting about this is that it might be a working example of both the unclear definition of disaster and how that definition fits into the NIMS protocol. A number of researchers discussed in Chapter 2, including Braga et al. (2008), Quarantelli (1991b), Barnshaw et al. (2008), indicated that terms such as disaster, catastrophe, and others were not well defined. Clearly, a snow emergency could rise to the level of a significant disaster, depending on the outcome and consequences, yet, merely closing an institution for a day or two while crews remove excess snow does not seem severe enough to rise to the level of a true disaster, even if a command center was activated. In light of this finding, then, it is apparent that the disaster and emergency management community
would benefit from clearer definitions, policies, and procedures, which is what the federal
government is attempting to accomplish with NIMS.

**Inferential Results: Statistical Associations with NIMS Compliance**

The study identified eight variables based on organization and governance, operations,
functionality, and finances to examine in relation to NIMS compliance in American HEIs. In
this section, each of these eight is discussed in terms of its relationship to NIMS compliance and
what might explain this finding, informed by previous literature.

**Organization and governance.** The organizational structure of institutions was not
found to be statistically significant in explaining variance in the dependent variable NIMS
compliance for the sample. This was an unanticipated result, since previous researchers have
suggested that organizational governance may affect preparedness. Farber (1982) pointed out
that the distributed nature of shared governance played a role in disaster preparation. Jenkins
(2008) concurred, finding that over 80% of respondents agreed that organization played a role in
preparedness planning. Farber (1982) and Wenger (1978) indicated that disaster preparation was
likely more tightly-coupled to organizational factors than to previous disaster experience. Given
these previous findings, it was expected that one or more types of institutional structures would
emerge in a leadership position for disaster preparation.

One explanation may be that no previous research has done such analysis across higher
education sectors as operationalized in this study. In other words, no previous study has sought
to directly link organizational archetypes to disaster preparation. Hence, it may simply be that
NIMS compliance in higher education is not tied to the governance nuances across those
institutional archetypes represented by the sample.
Second, as the years progress since NIMS compliance was mandated in 2005, it may be that organization and governance will emerge as an indicator of preparation performance, in that one or more structures may begin to play a leadership role in preparedness compliance. Time may reveal that it is easier to bring about change in some of these settings versus others, as it relates to disaster preparation. Though, to date, it does not appear that any one governance archetype thus far has moved more rapidly to NIMS compliance. Over time, this finding could change.

Third, it may prove to be that institutions across archetypes are paying considerable attention to disaster preparedness given the high profile incidents that have been reported through national outlets, hence compelling all institutional types to move as rapidly as possible toward compliance. Clearly, the intent of NIMS is to make disaster preparation a keen focus for all institutions. However, factors appear to be present that have at least partially impeded institutions across the archetypes to reach higher levels of NIMS compliance.

**Previous disaster experience.** Previous disaster experience was the next independent variable in this study not found to be a statistically significant indicator for explaining variance in NIMS compliance. This was another unforeseen result, since logic would suggest that previous hardship in disaster would provide strong impetus to move toward alleviating the potential for a reoccurrence. However, the result is consistent with Farber (1982) and Jenkins (2008), in that Farber noted that emergency management capability might be related more with organizational composition than with real-world disaster experience, and Jenkins suggested that institutional leaders within close proximity to, or with first-hand knowledge of, disaster experiences at other institutions do not appear more likely to engage in substantive disaster planning at their own institutions. The findings do seem to conflict with Mitroff (2005),
however, who suggested that previous experience positively impacts preparation, and Wenger (1978) who suggested that the level of disaster preparedness likely was correlated to previous disaster experience.

One of the underlying issues that could be creating the disagreement between the previous research results, informing this study, is what some of the effort was looking for as an outcome. Previous researchers such as Mitroff (2005) may have detected improvement in disaster planning that, while indicating movement in the right direction, did not equate to adequate disaster planning then, as Farber (1982) and Jenkins (2008) suggest, or within the current era of recent disaster occurrences at HEIs around the country, as this study found. This could be a cause for why researchers found inadequate preparation overall for some institutions. There may well be improvements in the disaster preparation of the institutions in this study that the study is unable to detect because it was not designed to look for that improvement. Improvement does not necessarily equate to NIMS compliance, which might explain some of the lower compliance scores as institutions move toward preparedness, but are not yet current with NIMS. Institutions could be improving, yet remain low in compliance. The research from this study, however, was not designed to measure incremental improvement in preparation. What the current study shows is that NIMS compliance was not indicated by the previous disaster experience independent variable.

To further reconcile the previous work with the current study, it might be that previous disaster experience does, in fact, positively affect disaster preparation, while not being a significant factor in NIMS compliance. While Jenkins (2008) reported that previous disaster experience did not cause adequate preparation results in his study, he did note that about half of respondents indicated that previous incidents had influenced preparation at their respective
institutions. That number rose to over 65% when the respondent also indicated that their respective institution was prepared for a crisis. Yet, Jenkins found that the institutions in his study lacked sufficient preparedness.

It is possible that the respondents in Jenkins’ (2008) survey perceived that previous disaster experience made a difference, but, in fact, that disaster experience was not a significant motivator to achieve adequacy. As such, improvement in preparation was perceivable but did not reach sufficiency. So, while Jenkins did not find that institutions were adequately prepared, there is some indication from his study that previous disaster experience played a role in improving preparedness at HEIs, which is then consistent with Mitroff (2005) and Wenger (1978), and makes sense in the context of this study. Therefore, while previous disaster experience was not found to be a statistically significant indicator of preparedness in this study, that result, in and of itself, helps to reconcile this discrepancy in the findings of the previous research. In sum, it may be that previous experiences do impact subsequent assessment of preparation and changes in policy and practice, but either their time frame is long or the nature of that preparation is more complex than is captured by the NIMS compliance variable in this study, or the previous work by Farber (1982) and Jenkins (2008).

Another angle on the finding is sourced in Farber (1982). He suggested that the previous disaster experience of the primary institutional leader was an indicator of institutional preparation. This indicates that preparedness levels at HEIs might be more effectively linked to specific personnel, rather than institutional, factors. It is certainly possible that the previous disaster experience of institutional leadership and/or of the primary emergency management planning and response person at an institution plays a significant role in preparedness levels at an HEI.
Finally, another issue worthy of note is that many institutions had little or no previous disaster experience, which is consistent with Jenkins’ (2008) findings. Previous research on latency and recency effects, including Lockwood (2005), Jenkins (2008), and Mitroff (2005), would suggest that if an institution has not experienced some kind of triggering event, it may not see a need to pursue a course of action, particularly one with cost implications. Common sense would also suggest that when someone perceives that a particular risk is low his or her likelihood of taking action to reduce or eliminate that risk is low as well, even when a singular incident can have catastrophic consequences. This is described as the “it cannot happen here” phenomenon (Jenkins, 2008; Lockwood, 2008) or the denial mentality (Mitroff, 2005).

**Institutional size.** Institutional size was the first variable to achieve positive statistical significance. This finding found strong support in the literature. Wenger (1978), for example, conjectured that the level of preparedness was correlated more toward institutional size and complexity. Farber (1982) agreed that the level and value of disaster preparedness at an institution might be more likely related to institutional size than other factors. Hartzog (1981) noted that size was significant in his study but did not have a persistent effect across the planning process at the institutions he studied. The results of the current study verify the previous results and conclusions.

The question remains, though, what is it about larger institutions that promotes higher levels of preparedness/compliance? Although the current study was not designed to determine the why, it can offer some speculative reasons. It is possible that administrators at large institutions feel less able to manage safety across campuses that typically span a large geographical area. This might be reflected in perceived vulnerabilities for a more extensive campus. This feeling of lack of control may tend to increase awareness of the need to develop
preparedness, thus increasing NIMS compliance. Another reason might be that it is easier for administrators to distribute the additional financial overhead expense across the larger number of departments in a larger institution. Said another way, it may be that emergency management/preparedness costs represent a smaller proportion of an annual budget at a larger institution. This would reduce the overall burden on a bigger institution.

Yet it might simply be that larger institutions tend to have, out of necessity, onsite police and rescue services, due to their size. These are the formal structures in which to house NIMS compliance personnel, ultimately facilitating better compliance due to a naturally built-in oversight structure. Since the foundations for monitoring NIMS compliance typically exist at these large institutions, it is a smaller step for them to implement compliance policies and procedures, rendering these institutions higher scores in NIMS compliance.

One other interesting issue is that the organization and governance of larger institutions, namely the anarchical/symbolic type, did not achieve significance in the study. This is surprising, since institutional size did achieve significance. As previously stated, it is possible that over time, institutional compliance will spread out, and organization and governance structure will emerge as an indicator of preparation performance.

**Legal representative on the disaster planning team.** Unexpectedly, legal counsel on the disaster preparedness planning team did not prove to be a statistically significant indicator of NIMS compliance. With little research from the past to reference, there is not much with which to compare the result. Experts have commented on the need for legal advice when considering disaster planning, including Hinckley (2006), Chun (2008), and Binder (2002). As mentioned in Chapter 2, the lone example of previous work that was found to contain information on the extent of legal representation on a disaster planning committee was Mitroff et al. (2006). They
noted that legal counsel was not well represented on crisis management teams in HEIs, which they, too, noted as a surprise. The results of their investigation found that of all the major participants on the planning team, the legal advisor was present the least frequently of all participants at 66%.

From one perspective, with only 34 of the sample institutions, 31.48%, reporting legal counsel on their planning team, this study somewhat supports the Mitroff et al. (2006) finding. The frequency is both low and surprising. From another perspective, the results of the current study stand in sharp contrast to the Mitroff et al. study’s results: the frequency of legal representation on institutional disaster planning teams, at 31.48%, was only about half of what they found. One explanation of this could be that the current study clarified the position as a permanent committee member position, as opposed to a position used “as needed,” i.e., used only when a need is perceived by the committee. This limitation might effectively filter the response, and ultimately reduce the final value, resulting in the lower percentage value recorded when compared to the previous work.

An additional insight from the study as to why legal counsel may not have been significant came from one respondent’s answer during the phone conversation questionnaire. He mentioned that having attorneys on the planning committee can have an unplanned effect on the success of the committee and actually limit its effectiveness by

- scaring people not to go on record against the attorney’s position/advice,
- limiting preparation to compliance-based planning, namely, compliance takes over versus operational need (e.g., liability associated with someone filling a role for which they were not trained), and
- looking at risk from an operations vs. compliance perspective.
This respondent suggested that the degree to which the above items occur depends on the attorney’s role, whether acting as an institutional manager or confidentiality manager. 

**Institutional sector: public vs. private.** Institutional sector was the second variable to achieve positive statistical significance in the study, with an expected result. Previous research evaluated preparedness from one sector or the other, but did not directly address differences between the private (Chun, 2008) and public (Jenkins, 2008) sectors. The current study found that public institutions scored significantly higher on the dependent variable NIMS compliance than their private counterparts. This is an important finding for both private institutions and governmental agencies. The big picture for preparedness here is that private institutions appear to be significantly less NIMS compliant than their public counterparts.

Currently, NIMS compliance is not a requisite for receipt of federal government educational funding, such as research grants and student aid, for HEIs. However, NIMS compliance is a requirement for the Emergency Management for Higher Education (EMHE) grant program funding through the ED.

One of the potential reasons public institutions have higher NIMS compliance is the more tightly-coupled state government oversight associated with public institutions. The DHS, through FEMA, has developed the NIMSCAST compliance reporting system that requires states to report NIMS compliance for cities, towns, counties, etc., including state HEIs. Through the state education appropriation funding process, states have the ability to control policies and regulations for public HEIs, including for disaster preparedness. Since NIMS is being adopted by the states, this fiscal/policy connection could easily explain the higher incidence of NIMS compliance amongst public institutions.
**Composite economic loss by state.** Composite economic loss by state was not a statistically significant indicator of variance in NIMS compliance for HEIs. States with larger composite economic losses, by definition, have a greater propensity for experiencing disasters. However, that link did not appear to hold by extension to NIMS compliance for HEIs. It is also interesting to note that there was no collinearity between previous disaster experience and composite economic loss. It seems logical that there would be some correlation between disaster experience and economic losses due to disasters within a specific region such as a state, but that statistical relationship was just .005.

A few different drivers could be underlying the disconnect between state disaster propensity and institutional disaster preparation as measured by NIMS compliance. First, the last three years of previous disaster experiences may not be reflective in a consistent way with the last 50 years of disaster economic losses in individual states. Second, it is possible that, since winter 2011 was severe, the snow-emergencies experienced by many of the sample institutions skewed the previous disaster experience data in a way that does not link to a state’s composite economic loss. Finally, it is important to note that individual institutions may not perceive the state economic loss index to be an actual, or potential, indicator of their specific disaster risk.

**Statistically insignificant variables.** That the study showed that some of the chosen factors were not statistically significant is an important result in and of itself. There has been little previous research done to address disaster preparation in HEIs. Though it is important to know what factors might affect disaster preparedness, it is also important to understand what does not appear to affect disaster preparedness in higher education. The study demonstrated that some individual institutions of each organization and governance archetype have taken appropriate measures toward disaster preparedness as gauged by NIMS compliance. Yet, with
some institutions scoring better on NIMS compliance than others, the results of the study suggest other drivers toward preparation are compelling effort in this arena. Further research will isolate what other motivators might be driving these efforts.

**Policy and Practice Implications for Institutions**

There are a few important implications for HEIs from this study. These are detailed in the subsections that follow. Implications for governmental agencies are discussed in the next section.

**A gap in private institution compliance.** First, the study found that institutional sector was significantly correlated to NIMS compliance, suggesting that private institutions, in general, lag behind their public counterparts in preparedness compliance. Private institutions should be aware of the potential for serious consequences for lack of disaster/emergency planning. Legal advisors, and disaster researchers alike, have warned about these consequences for ill-prepared institutions and their administrators, including Hinckley (2006), Chun (2008), and Binder (2002). Chun went so far as to say that FEMA reimbursement funds following a disaster are jeopardized for private institutions that are not NIMS compliant. As such, private institutions must let that recognition translate into motivation to step boldly toward preparedness. The consequences of being ill-prepared can be serious. The literature has examples of ex post facto analysis of institutions, both public and private, that should have been more attentive to the issues of disaster preparation and emergency management (Aschenbrener, 2001; IACLEA, 2006; Johnson, 2007; Wilson, 1992).

**Better preparation needed across the sectors.** Second, it must also be noted that, while public institutions scored significantly better on NIMS compliance than private institutions, neither public nor private institutions scored highly on NIMS compliance as a group. To be sure,
there were some high performing institutions within each group. However, the NIMS compliance statistical average for institutional sector between public and private institutions was found to be 70.03% and 50.37%, respectively. This indicates that private institutions are not the only ones who need to be attentive in moving towards improving preparedness through NIMS compliance.

One potential factor in the low mean compliance scores across both sectors is the lack of any statewide or federal mandate, though a mandate should not be required for any institution to become prepared for disaster. Constituent safety alone should be the reason to pursue disaster preparation. Since the government is setting the standard with NIMS, it makes sense that public institutions would lead the way in planning and preparation. It is entirely possible that this is exactly what is happening currently through a quasi self-selection process, given the results of this study. There is reason to believe that the results of this study, exposing that a difference already exists between public and private institutions, will be the impetus for motivating private institutions to action.

Both public and private institutions need to work toward identifying impediments to disaster preparation. Once identified, institutional leadership must endeavor to ascertain the mechanisms needed to remove these impediments and strengthen preparation plans and policies. This will begin the process of moving the institution toward higher NIMS compliance and better disaster preparedness.

**A gap in smaller institution preparation.** Third, a similar issue faces smaller institutions. That the study found that institutional size was significantly correlated to NIMS compliance suggests that smaller institutions, in general, are behind their larger counterparts in
preparedness. Smaller institutions need to be aware of the importance of recognizing the questionable position they are in as it regards being ready for a major disaster.

As noted previously, NIMS compliance is associated with trained first responders. Many smaller campuses have no permanent, on-site disaster and emergency management presence. If an institution has no first responders, by definition can it become NIMS compliant? This might portend a serious flaw in the conceptual nature of measuring preparedness through the use of a compliance metric such as the NIMS. This is addressed in a later section.

Another issue for smaller institutions is the cost overhead of retaining experienced personnel for managing disaster and emergency management responsibilities. For larger institutions, many of these responsibilities are coordinated by the campus police or a dedicated emergency/risk management team. As it happens, disaster awareness has become more visible as a real issue for higher education due to incidents like Hurricane Katrina and the Virginia Tech massacre. Unfortunately, institutions are now seeing this importance at a time when a downturn in the economy is further making resources scarce. Institutions are struggling with the notion that Bowen (1980) talks about in his revenue theory of cost, namely that HEIs tend to spend all of the funds that they take in on the educational enterprise. This leaves little to nothing for what has historically been seen as peripheral and potentially unnecessary programs and policies. These extra overhead costs are likely difficult for smaller institutions to justify.

A demonstration of the administrative lattice. Section 4.2 of NFPA 1600 specifies the appointment of personnel to manage disaster preparation policy and practice (NFPA, 2010). The consequence is a requirement for administrative personnel to be put in position to handle the responsibility of the added burden placed on institutions by the government. This is because of the depth of detail required in continuous evaluation, development, training, and improvement in
institutional preparedness policy and practice. An extremely interesting result here is the opportunity to observe the phenomenon described by Zemsky (1990). The addition of administrative personnel for disaster planning and emergency management provides a living example of how the administrative lattice works. In other words, new administrative support personnel are added in a lattice-like process, in this case, in response to further governmental regulation. Thus showing how the administration expands following Zemsky’s example.

To conclude this section, institutions, both public and private, must move to make changes to internal policy that elevates disaster preparedness to a level that requires all participants to engage and participate in planning and practice. This is extremely important, as evidenced by the Virginia Tech massacre, and verified in the 9/11 Commission report (2004): “Indeed, unless a terrorist’s target is a military or other secure government facility, the ‘first’ first responders will almost certainly be civilians,” (National Commission on Terrorist Attacks Upon the United States, 2004). Anyone can become a first responder at a moment’s notice. This is a wake-up call to all HEI administrators at institutions that have incomplete disaster planning to move quickly and decisively toward implementing disaster preparation policies and practices.

**Policy and Practice Implications for Governmental Agencies**

This study opens several important areas in both policy and practice for agencies involved with disaster readiness in higher education. These are discussed in the subsections that follow.

**Building a case for institutional preparation.** There is real variability that exists in the implementation of disaster planning and response in HEIs. This is evidenced by the differences in the mean scores for NIMS compliance for the sample institutions. As mentioned above, many of the responsibilities for disaster preparation and emergency management are currently
managed by the campus police forces of larger institutions, rather than a dedicated emergency/risk management team with membership that includes non-law enforcement personnel. This is a reasonable approach for disasters and emergencies requiring police intervention. However, broader administrative awareness of other potential disaster types across the campus has demonstrable value for response purposes. Administrative preparedness limitations were painfully exposed through tragedies such as the Virginia Tech massacre where the administration was criticized for not taking a more proactive role in minimizing the disaster (Davies, 2008). Governmental agencies need to emphasize the importance of broader administrative engagement in compliance activities to ensure that institutions are adequately prepared.

**Adopting improved measurement metrics.** One way to alleviate the variation in preparedness is to adopt better metrics for measuring an institution’s ability to respond to incidents that may arise. One noticeable omission in the current compliance metric is any requirement of practice drills or functional exercises. Anyone who has ever picked up a musical instrument and tried to play it is painfully aware of the importance of practice. Nobody is going to venture out to a concert to hear a group of musicians who picked up their instruments for the first time that same day. Why then would anyone consider attempting to face an emergency situation without having well rehearsed plans and policies in place, with emphasis on practice? It is easy to visualize that this is of even more paramount importance considering that most disaster situations unfold under incredibly adverse conditions that further stress the administrative leadership’s ability to perform.

Improved objective measurement standards for preparedness/NIMS compliance in HEIs that include a practical component are an imperative. The DHS should move to encourage
adoption of an extended compliance metric that incorporates such a practical component. FEMA should partner with institutions to foster both table-top and full-scale exercises onsite at these institutions. This type of cooperative endeavor would enable FEMA to benefit by using the occasion to develop overarching concepts applicable to higher education, and would provide the institution the opportunity to gain from the site/location specific applications of the practice of those concepts.

Simulations would provide opportunities for FEMA and emergency management personnel to develop best practices for the specifics of colleges and universities that, while similar in some ways to cities and towns (Bickel and Lake, 1999; Mitroff, et al., 2006; Osburn, 2008;), are a unique environment with distributed governance, unlike any other businesses or municipalities (Farber, 1982; Ketterer et al., 2008; Winston, 1997). As such, it would seem that best practices for disaster preparation must take this into account. To be sure, FEMA is coordinating simulation exercises with municipal governments and counties. Some of these even include institutional participation. However, onsite HEI simulations would allow specific and focused scrutiny of institutional preparation shortcomings, providing The DHS with the opportunity to fine-tune best practices for HEIs from an overarching perspective.

Additionally, simulations coordinated by The DHS have the benefit of providing institutions with a focused approach to their own preparedness planning. This could open up campus-wide awareness to disaster preparation. A couple of benefits could accrue from this approach. First, campus-wide engagement of institutional constituents brings everyone onboard with the concepts of disaster planning. Second, the exposure to practice creates confidence in both the institution’s and the individual’s ability to participate effectively in addressing incidents
as they arise. These provide localized application and implementation of global best practices, nuanced with the specifics of the uniqueness and variation that define each institution.

**Considerations of the administrative lattice.** Funding agencies should take note that the additional regulatory cost burden to institutions is not inconsequential. Since much of disaster planning and preparation deals with general public safety, including law enforcement, fire protection, and rescue operations, government agencies should consider creative ways to alleviate the added burden on institutions, both public and private. Since private institutions may provide similar safety aspects to the local community, agencies should work to provide solutions that do not impose sanctions on private institution operation, protecting their sovereignty.

Several options exist to relieve institutions of the added financial/regulatory burden generated by compliance initiatives. First, perhaps agencies might partner with institutions in a matching-funds program that would reduce administrative costs for institutions moving to incorporate NIMS compliance into their operations processes. Grants, a second option, could be a way for these agencies to provide the most relief to any HEI looking to complete the process of implementing NIMS compliance processes within a comprehensive disaster preparation portfolio. A third option for some institutions might be to craft agreements within the local community in order to form partnerships where the institution and community together provide resources toward preparation where neither of the two entities could reach compliance on their own without the other’s participation. This is expanded on in the next section.

**NIMS compliance as a mandate for HEIs.** NIMS compliance mandates at the state level have the potential to overlook institutions that have no first responders, which is a serious flaw in the conceptual nature of measuring preparedness through the use of a compliance metric
such as the NIMS. If an institution has no first responders, by definition it cannot become NIMS compliant.

That any institutions could fall through the cracks in disaster preparation is worthy of a look at how the use of a compliance metric could be improved to eliminate the potential for missing these institutions. It is understandable how this can happen. Since these institutions do not retain any first responders, they do not perceive, nor do they rely on, their own ability to respond to disasters. Instead, they rely on local municipal services to respond to disasters. Many smaller private institutions and community colleges fit into this category of institution.

Regardless, these institutions still face exposure to the same disasters as any other institution that has large numbers of full-time first responders. The risk remains, so some mechanism to provide real compliance must be found. At a minimum, compliance for institutions that have no first responders could be bound up in partnering with those municipal entities that provide resources and services for disaster planning and response. If the compliance perspective is expanded to require administrators at all institutions to be NIMS compliant, then the outside agencies providing the disaster services could work with the institution to provide a seamless approach to disaster preparation, as if the institution retained its own first responder, effectively bringing these institutions into full NIMS compliance.

**Accreditation.** An accreditation process is potentially another effective approach to affecting institutional disaster and emergency management compliance. The Emergency Management Accreditation Program (EMAP), which uses NFPA 1600 as its basis, developed guidelines used when accrediting state and local government emergency management programs. Since HEIs have some characteristics of cities or small towns, it might be possible to expect compliance as part of an institution’s accreditation. Whether or not an accreditation such as this
would be better overseen by EMAP or a regional accreditor is a discussion for accrediting bodies. The point is that accreditation processes might serve to standardize preparation for HEIs, and provide stability for preparedness in higher education.

**Moving toward defining disaster preparation.** Although Jenkins (2008) suggested that previous disaster experience does not really affect preparedness, his study showed that people thought it did. More importantly, however, although his survey respondents thought previous disaster experience made a difference in preparedness, Jenkins found institutional disaster plans inadequate. This suggests that a gap exists in the understanding of what it means to be prepared. This is important for policy and practice because leaders should be aware of this as a solvable issue. A gap in understanding can be overcome by training and education, along with targeted strategies to help practitioners to move institutions toward full rather than symbolic compliance. Additionally, it should stimulate a review of compliance to manage the issue of whether NIMS compliance really equates to preparedness.

**Study Limitations**

Due to practical limitations in the sample, this study could not cover all institutions within U.S. higher education. Therefore, it is not be able to provide information on every possible scenario for each type of institution. Hence, the findings should be considered carefully as they may not universally apply to every type of institution in the country. For-profit institutions were not considered in this study, for example. Additionally, only institutions with regional accreditation were considered for inclusion in the study. Every attempt was made to identify institutions that fit the organization and governance types within the Carnegie classifications, however, and a random selection for representativeness pursued for those types of institutions. Nevertheless, these are best-fit categories, and leave many institutions out, since
they do not fit as cleanly into the typology. Hence there are other institutions that should be studied to see how their disaster preparation is proceeding in terms of NIMS compliance.

Even as of this writing, the nature of emergency and crisis management preparation is evolving. Mitroff (2005) suggested that the discipline is less than 30 years old. Rapid development is taking place as a result of a steady maturation process, and one study is unable to present a comprehensive overview of disaster preparedness in American higher education. As the level of change within the direction of the defining standards increments forward, the results contained herein might become increasingly or decreasingly applicable over time.

Nature is unpredictable; hence institutions cannot fully defend against every possible and potential disaster. Trying to accomplish this task is impossible on multiple levels, including for practicality and cost reasons. The scope of Hurricane Katrina, for instance, was so extensive that it was impractical to protect everything from damage. This study cannot provide a solution to this truly catastrophic scenario.

This study is only able to present the respondents’ perceptions of compliance, since each respondent may have a different perception of what NIMS outlines or requires. As such, preparation at one institution may be influenced by the nature of self-reporting and individual understanding of NIMS and its application.

The decision was made to use NIMS compliance as a measure of disaster preparedness for this study, since it is the same measure that The DHS uses to gauge preparedness. The government is attempting to create a uniform operational standard for preparedness through the implementation and use of NIMS in the U.S. However, states, being sovereign, elect both the manner in which they implement NIMS and the rate of that implementation. Thus the standardization process has not been completed to this point.
In some states, compliance is only mandated for first responders. There is no obligation/mandate of compliance for non-responders. Therefore, institutions that lack emergency services personnel may not have a NIMS compliance initiative, and are not required by state mandate to have one (R. Purvis, personal communication, February 7, 2011). Some states have been aggressive in developing preparedness (D. Smith, personal communication, February 10, 2011). Some are lagging behind in HEI compliance reporting (R. Bodane, personal communication, February 11, 2011). This indicates that there exists a wide variation in the compliance requirements for institutions across state lines. However, since NIMS is currently the de facto standard for preparedness at the national level, as measured by The DHS, this study’s use of NIMS compliance as a proxy for a preparedness score to determine the variable relationships of interest was reasonable, but still might be a limitation. There have been no previous studies to validate using NIMS compliance as a proxy for preparedness.

Additionally, an institution could pay lip service to NIMS compliance, using it as a symbolic level of preparation. Osburn (2008) covered the issue of symbolic plans in detail, suggesting that organizations could simply use the process of preparation to put a sign on themselves to say, “we are in control,” when in reality that is not the case. There is no way to determine by this survey if the institutions embrace disaster preparation through NIMS compliance, or are simply checking off boxes in a checklist for the illusion of compliance. In other words, this could simply be paper compliance rather than actual functional compliance. Determining this is not the focus of this study. Another study would be needed to perform that investigation.
This study is based on a self-reported evaluation by the institutions involved, and taken at face value. However, there is an underlying question that remains, which pertains to the quality of implementation as it relates to preparation. Mitroff et al. (2006) noted that:

What colleges and universities currently call crisis-management teams are mainly emergency response teams, the main function of which is to prepare for and to respond to natural disasters such as earthquakes and environmental crises such as toxic spills, or business continuity teams, which exist mainly to ensure the continuity of the business functions and services of major organizations. (p. 62)

The question remains as to whether by becoming NIMS compliant an institution transitions to an organization capable of managing “a wide range of possible emergencies,” (Mitroff, et al., 2006). This study is unable to provide an answer to that question.

Another potential limitation is that the current study is unable to verify compliance scores for individual institutions. Attempts were made, to no avail, to gain access to the NIMSCOM database, at The DHS, where states report NIMS compliance for HEIs. As such, compliance scores were taken at face value through the email/phone survey. There is an underlying potential for mistakes in reporting the compliance scores. However, these limitations are addressable in future work that might build on this study.

**Future Research**

This section offers areas for future research to further uncover the issues surrounding institutional disaster preparation. Some of these build on what was discussed in the limitations sections, while others provide additional means of studying the subject.

**Longitudinal study.** Institutional organization and governance did not prove to be statistically significant in NIMS compliance for this study. As noted, there has only been a short
time lapse since the NIMS has been in place, which might be impacting this study’s ability to determine an effect. NIMS was directed in HSPD-5 only in 2003 and its adoption mandated by The DHS for internal agencies only in 2005. Institutional inertia potentially is constraining progress by HEIs toward compliance in such a short period of time. As time progresses, and the NIMS compliance process matures, a repeatability study may provide better insight on disaster preparation.

**Intra-institutional concurrence of understanding.** A potential question to evaluate is that of the issue of concurrence in the understanding of institutional preparedness within an institution, based on administrative responsibilities, which could take on the form of examining the difference in perspective between the primary administrator (president, chancellor, etc.) and the primary person responsible for the implementation of disaster preparedness and subsequent disaster recovery plans. Those who have experience in disaster response, or whose responsibilities are inherently linked to campus safety, may have a far different comfort level with institutional disaster preparation than the administrative leadership whose focus is more global.

The disaster preparation confidence level of the president, who has allocated what he/she thinks are appropriate funding resources, and who has appointed a person or committee specifically to address security/disaster issues, may be higher (possibly artificially) than the person in charge of the securing of the institution in times of crisis response. Of necessity, the security personnel are going to be actively, and hopefully aggressively, searching for potential problems and breaches, and may have a more realistic perspective on overall preparedness. New studies would help to inform disaster preparation literature.
Disaster preparation leadership. One of the issues already mentioned earlier is that of the lack of statistical significance of some variables chosen for use in this study. The fact that these did not show any correlation with NIMS compliance is in itself an important finding. The study showed that, in general, institutions of all types are somewhat prepared for disasters/emergencies, with some more so than others. Yet, given that some institutions have higher NIMS compliance scores than others suggests other issues might be driving the effort toward preparation. As previously mentioned, it is possible that compliance may not be so much associated with institutional factors as with some other independent factors such as nuances and attitudes of particular institutional personnel. Along with examining concurrence in understanding between the primary administrator and the primary disaster management administrator described above, future work should look at the leadership capabilities of both of these individuals to tease out whether leadership capabilities of the emergency management personnel play a role in successful disaster preparation.

Potential variable interaction. To further nuance the significant variable findings, since both institutional size and institutional sector were found to be statistically significant, an evaluation that examines how institutional size operates within the institutional sector variable might benefit the literature. The sample size of this study is likely too small to provide significant results. An expanded study should be done that examines both institutional size and institutional sector to determine if ant variable interactions are present. It is possible that preparation is more closely linked to institutional size in either the public or the private sector. A study looking at disaster preparation in both institutional sectors could prove to be a significant contributor to the literature on disaster preparedness in HEIs, by further identifying the types of institutions that are prone to falling behind in preparedness.
**Previous disaster preparation.** Finally, since previous disaster experience did not prove to be statistically significant in explaining NIMS compliance variance, and since Farber (1982) alluded to previous disaster experience as influencing future preparation in HEIs, a study should be done that examines both institutional leadership and institutional emergency manager experience with previous disasters. It is possible that preparation is more closely linked to personal disaster experience than with institutional factors. A study looking at disaster experience of both institutional leadership and personnel directly linked to the responsibility for institutional disaster preparation could prove to be a significant contributor to the literature on disaster preparedness in HEIs.

This is not an exhaustive list of potential future research topics. This study appears to be the first quantitative study to examine disaster preparation, and therefore the topic is just beginning to be examined. This leaves the themes wide open for future researchers to probe.

**Conclusions**

It is important to note that there was no real disaster and emergency management practice in place for many years. Interestingly, this reflects the reactionary nature of the discipline—always one step behind the curve of the next worst disaster and using the current worst case as the bar from which to measure the future. To use a tired old cliché, the discipline is always “a day late and a dollar short.” It is also important to note that most of the research done to date on disasters and preparation are reactionary studies in that the research reflects the history of the discipline, using the historical worst-case criteria by which to measure all future hazards. Quarantelli (1991b) explained it well,

One of the major findings of disaster studies is that crisis relevant organizations tend to look backwards in time, at the last and biggest emergency and/or disaster to have
happened in their jurisdiction. That occasion is usually taken not only as the maximum probable but as the kind of disaster for which there should be preparation (We will ignore in this paper, the dysfunctional consequences there can be for societies and communities that take this stance.)…. (p. 1)

Quarantelli (1991b) added,

This kind of thinking is not peculiar to crisis relevant government agencies. The nondisaster organizational literature fully documents how most companies and industries tend to look to the past in their planning for whatever they undertake. But studies also show that the most successful groups are those that look to the future. That is one reason why such companies and industries are likely to have strong research and development (R & D) programs which project into the future and plan to meet upcoming needs. (p. 1)

Thus the real problem is that the preparation–planning, education, and practice–always seems to lag actual needs. Through this lens, the progress toward state-of-the-art disaster preparation is underwhelming and slow to materialize. To solve this issue, policy makers and practitioners must begin to work together with other disciplines to move beyond the current perspective on worst cases to a process capable of handling a variety of incidents that are not characterized by historical events, but by potential in the future. Only then will institutions be capable of implementing preparation planning that will endure its challenge.
Approaching seven years post-Hurricane Katrina, things remain unsettled on the Gulf Coast. Immediately after the storm, I heard estimates of 5-years for the Gulf Coast to rebound and rebuild. Sadly, that estimate has proven to be exceedingly optimistic. The University of Southern Mississippi Gulf Coast is partially occupying their campus, though many of the buildings still remain uninhabitable. Another institution, William Carey College, just finished razing all of the buildings on their once vibrant campus. The now vacant property has been for sale since shortly after the storm, as are many other properties in the affected region. Most businesses and houses along the coast have not been rebuilt. Rebuilding the community in 5-years would have been good. Wounds this large take a long, long time to heal.
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APPENDIX

TELEPHONE QUESTIONNAIRE PROTOCOL

The telephone questionnaire protocol will be as follows. Following researcher introduction, the interviewer will explain the nature of the study to the interviewee and that there are just three factual questions\(^1\) being collected through the interviews. The researcher will also explain that no identifiable information about either the participant or the institution will be released in the study report and that the information an individual provides will only be used to develop a composite regression model for identifying associations between the independent variables and NIMS compliance.

The three questions are as follows:

a) Is a legal representative a sitting member on the institutional disaster planning committee, as opposed to an “as needed” advisor?

b) What previous disaster experience has the institution experienced?

c) What is the current institutional NIMS compliance level?

\(^1\) The fact that only factual/information questions about institutional participants are being asked, the study is not defined as one involving human subjects as per the Chair of the Institutional Review Board.
Is a legal representative on the institutional disaster planning committee? This is a simple yes or no question. The question will be posed to the interviewee, and the answer recorded in a spreadsheet.

What previous disaster experience has the institution experienced? This question seeks information regarding the previous disaster occurrences at the institution in question. The interviewer will read the following list of potential disaster incidents to the interviewee, explaining that these are not necessarily all disaster incidents, but have the potential to be a disaster for the institution. This list was developed from the list of crises used by Mitroff, et al. (2006) for their study.

1. Serious outbreaks of illness/disease among students, faculty, or staff.
2. Major food tampering incidents.
3. Employee sabotage.
4. Fires, explosions, chemical spills.
5. Environmental disasters.
6. Natural disasters, such as hurricanes, tornados, floods, etc.
8. Theft or purposeful compromise of confidential/sensitive information/records, IT security breach.
9. Major lawsuits.
10. Terrorist attacks.
11. Ethical breaches by administrators/faculty/trustees.
12. Major crimes committed by faculty, staff and students.
13. Major crimes committed against faculty, staff and students.

What is the current institutional NIMS compliance level? This question is designed to retrieve the same reporting statistic as that accepted by the NIC for use in the NIMSCAST system. The interviewer will give the following description of the DHS metric for NIMS compliance, and will ask the respondent for the institutional NIMS compliance score. DHS uses the percentage of trained first responders (i.e., the ratio of NIMS trained first responders to all first responders) as the NIMS compliance score. The interviewer will then request the current NIMS compliance score for the responder’s institution.