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Great Expectations: Environmental Hazard Incident Prevention at New Jersey Facilities that Serve Seniors

By

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A dissertation submitted to the

School of Graduate Studies

Rutgers, The State University of New Jersey

In partial fulfillment of the requirements

For the degree of

Doctor of Philosophy

Graduate Program in Geography

Written under the direction of

Dr. Michael R. Greenberg

And approved by

New Brunswick, New Jersey

May 2018

ABSTRACT OF THE DISSERTATION

Great Expectations: Environmental Hazard Incident Prevention at New Jersey Facilities that
Serve Seniors

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Within the 21st Century, New Jersey has been involved in 20 federally declared environmental disaster events by the Federal Emergency Management Agency (FEMA 2017). Of those 20, three have been major tropical-induced events that made direct or indirect landfall in the State. The most recent extra-tropical system (i.e. Superstorm Sandy) made direct landfall along the southern part of the New Jersey coast and caused more destruction to ecological, social, and infrastructure systems than some municipalities had seen in all prior events combined. Forty-six percent of the total deaths reported during Sandy, or 45 people out of the total 93 deaths, were seniors over the age of 65 (Greenberg 2014c).

A regulation was passed in New Jersey in 2007 that required long-term care facilities to develop emergency operations plans (N.J.A.C. 8:39 and 8:43E). However, the legislation lacks details of enforcement needed to ensure facilities are meeting the outlined requirements. Requirements include review of plans with local emergency managers, but officials are not provided a mechanism to demand changes be made to a private facility's plan. The most crucial issue is the lack of protocols to ensure multiple facilities are not simultaneously reliant upon the same resources under a disaster within the same municipality.

This research examines the level of preparedness of senior facilities to respond to environmental natural hazards in New Jersey as well as their coordination with the local emergency responder community. The research uses mixed-methods to identify overall

preparedness. The findings indicate that there is coordination between local (i.e. municipal or county) emergency managers and senior facilities located within their jurisdictions. The level of coordination varies depending on the MCC Region of the State the facility is located in as well as the individual importance coordination and collaboration are perceived by both the facility administrators as well as the emergency managers.

Dedication

To my children, who have put up with years of me telling them that mom has to go do work. To my sister for her continued positive motivation and to my husband whose support is the reason this dissertation is complete.

Acknowledgements

I would like to acknowledge my advisor, Dr. Michael R. Greenberg, for his constructive critiques and support throughout this entire process. Your encouragement is the reason I started this journey and I appreciate your willingness to take me on as your last Ph.D. student. I would also like to extend a big thank you to my committee: Dr. Richard Lathrop, Dr. Dona Schneider, Dr. Lyna Wiggins, and Mr. Roberto Muñiz. Your time, support, and suggestions for this research were very much appreciated and helped improve it greatly.

I would also like to acknowledge and thank Dr. Marc D. Weiner for his tutelage on quantitative and qualitative techniques and whose instruction and support gave me the confidence to integrate a mixed methods approach into this research. I would also like to acknowledge Jeanne Herb, who provided support above and beyond what I could ever thank her for. Your continued confidence in my work gave me the motivation I needed to continue to push forward and “stay the course” when other obstacles presented themselves. To Dr. Marjorie Kaplan, for your support and encouragement and for believing that this research would make a meaningful contribution. To the EAC team – for all your help adding humor to our days at Bloustein, especially when we were all stressed. Finally, thank you to Samantha Michael for being a good friend and listener throughout this process.

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Chapter 1: Introduction

This thesis is about preparedness of senior facilities to respond to the potential impacts caused by natural environmental hazards with a focus on key strategies for risk reduction.

Defining Senior Facilities

Senior Facilities, defined for the purpose of this research, include: Long-Term Care facilities, Nursing Homes, and Assisted Living facilities. These terms can be individually defined as the following¹:

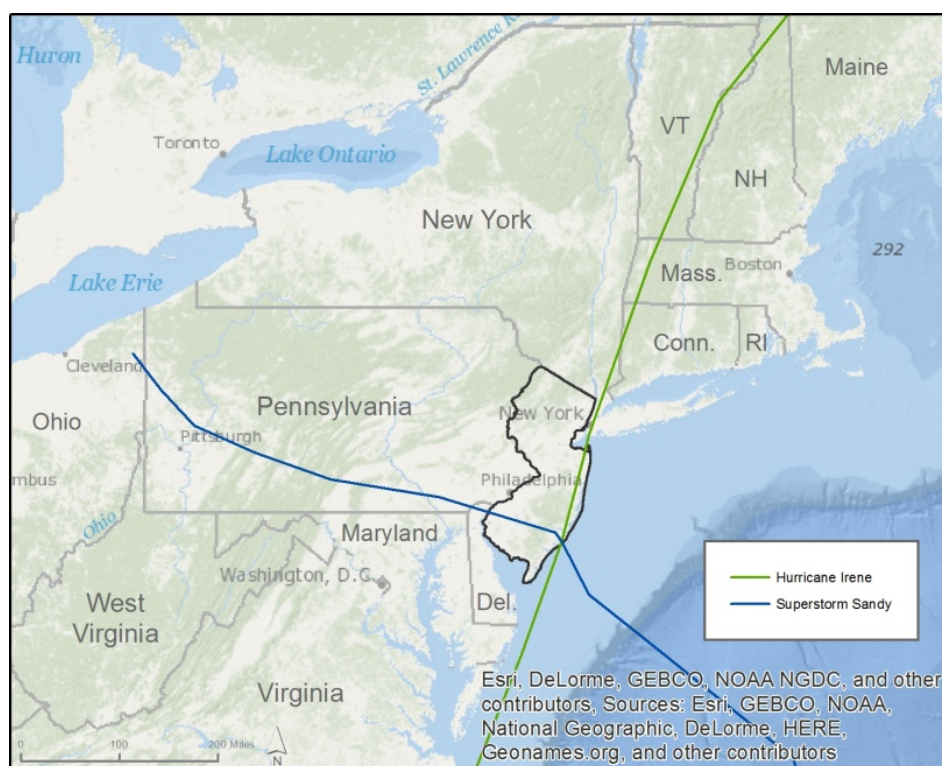
- 1) Long-Term Care Facilities – defined by the New Jersey Department of Health (NJDOH) as providing room and board. These facilities offer assisted living services when needed and residential units house no more than two residents at a time and have a lockable door.
- 2) Nursing Homes – defined as providing health care services under continuous medical supervision and nursing care for 24 or more consecutive hours to residents who require continuous nursing care and services above the level of room and board.
- 3) Assisted Living Facilities – defined by the NJDOH as providing meals and services through staff resources to a residents in an apartment-style living environment through a licensed assisted living residence or a licensed comprehensive personal care home.

Context

Since the 21st century, New Jersey has been involved in 20 federally declared environmental disaster events by the Federal Emergency Management Agency (FEMA 2017). Of those 20, three have been major tropical-induced events that made landfall in the State. The most recent extra-tropical system (i.e. Superstorm Sandy) made direct landfall along the southern part of the New Jersey coast and caused more destruction to ecological, social, and infrastructure systems than some municipalities had seen in all prior events combined.

¹ <http://www.state.nj.us/health/healthfacilities/about-us/facility-types/index.shtml>

Figure 1.1. State of New Jersey with 2011 and 2012 storm tracks



Senior populations are aging in locations across the United States that are susceptible to major hazard events, with six out of the 10 states with the highest proportion of seniors also having the highest number of disaster declarations (Greenberg 2014c). Seniors' vulnerability "range from about twice as likely to be killed to more than 10 times as likely" in natural or man-made disaster events and "the likelihood of death increases substantially as seniors move into the 75+ year old age group and again when they reach 85 years" (Greenberg 2014c, 49). This is an important consideration when put in context with a 2008 Centers for Disease Control and Prevention (CDC) report which indicated that 80 percent of adults over the age of 50 years old have at least one chronic condition that makes them more vulnerable during a natural disaster when compared to younger people without chronic conditions (Aldrich 2008). A similarly striking statistic from the same report articulated that 71 percent of the people who died because of Hurricane Katrina in Louisiana were over 65 years of age (Aldrich 2008, Powell 2009).

Likewise, 51 percent of the population killed during the 2004 tsunami that impacted Aceh, Indonesia, were 60 years of age or older. These events show that in low probability high impact storms (Greenberg 2014c) vulnerable populations, and specifically seniors, are at much higher risk for devastating impacts to their health and well-being. In New Jersey, 46 percent of the total deaths reported during Sandy, or 45 people out of the total 93 deaths, were seniors over the age of 65 (Greenberg 2014c). Only 15 percent of the New Jersey population was over 65 years of age in 2012, so the consequences high impact storms have on this group of vulnerable populations is clearly evident under these circumstances.

Population pyramids provide a useful way to visualize trends in total population for a specified area. The pyramid is split into two groups, male and female, and then age intervals are represented by bars that show age ranges in five year intervals. These visualizations help to better identify trends in the population by identifying the distribution of the data broken into three categories: pre-reproductive (i.e. 0-14 years old), reproductive (i.e. 15-44 years old), and post-reproductive (i.e. 45-100+) age groupings (Preshoff 2014). Population trends over time can then be seen for a specified geographic region to determine whether an area's population will be majority older (i.e. post-reproductive), younger (i.e. pre-reproductive), or working-age (i.e. reproductive). The United States' population pyramid shows a general trend towards an ageing population.

The United States Census estimates that the United States population of 65 years or older will increase by 66 percent through 2035 (JCFHS 2016), and more than double present day values overall by 2060 (Colby & Ortman 2015). "Due to the increasing share of the population that is 65 and older, the old-age dependency ratio is projected to increase, surpassing the youth dependency ratio in 2033" (Colby & Ortman 2015, 7). The total number of persons 65 and older

living in a senior facility, however, will decline slightly and then level off during the same time period (Ortman et al. 2014). In 2014, 4.2 percent of the United States population 65 years or older live in a senior facility with less than four percent of the same population in New Jersey living in facilities that house seniors (Sengupta et al. 2016, U.S. Census Bureau 2016). The majority of the populations living within these facilities are the most vulnerable to effects from natural and man-made disasters (Greenberg 2014c) because of their reliance on other people and resources to help with their daily activities. The staff and emergency preparation procedures that occur at these facilities are an important aspect to examine because of the negative consequences poor preparation may have on the residents and their families.

In 2007, New Jersey passed regulations that required long-term care facilities to develop emergency operations plans (EOP) (N.J.A.C. 8:39 and 8:43E). This action supplements federal law requiring Medicare and Medicaid certified facilities have plans and procedures addressing all-hazards, to include procedures for evacuation of the facility, and assurances that staff are trained on these on a periodic basis (Castle 2008). However, the legislation lacks details of enforcement needed to ensure facilities are meeting the outlined requirements. Requirements include review of plans with local or county emergency managers, but officials are not provided a mechanism to demand changes be made to a private facility's plan beyond the yearly review process. Additionally, emergency managers recognize the owners and operators of senior facilities as the responsible authority for emergency preparedness, planning, and implementation should an event occur. Corresponding requirements for municipality emergency managers to meet and review the plans with facility managers do not exist. However, the most crucial issue is the lack of protocols to ensure multiple facilities are not simultaneously reliant upon the same resources at the same time under a disaster within the same municipality. While emergency

management's role during an event is to protect the people involved, with larger scale events such as natural hazard events, resources can easily become scarce and senior facilities are expected to take on the lead role for emergency response until local emergency responders become available.

Research Objectives

This thesis will examine the level of preparedness at senior facilities in New Jersey, as well as their coordination with local emergency managers, specifically examining the following questions:

Primary:

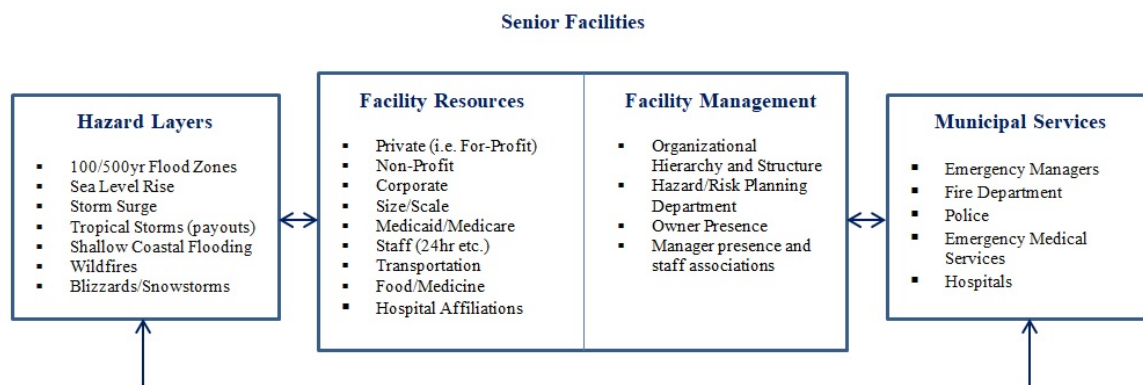
- To what extent is hazard preparedness and response planning coordinated between local emergency response agencies and senior facilities, and how can communication and coordination be improved?

Secondary:

- How does the size of a facility and association (i.e. for profit versus non-profit) affect its ability to prepare and respond to disaster events more effectively?
- Do senior facilities place an additional burden on the already overburdened municipalities they are located in?
- What gaps exist in current planning efforts of senior facilities and how do those gaps impact public service providers?

Figure 1.2 below provides a conceptual map developed as part of the beginning stages of this research and to guide the overall research process. The hazard layers listed below will be examined as part of the hazard assessment completed in Chapter 3.

Figure 1.2. Concept Map of Proposed Research



Organization of the Thesis

This dissertation provides information about ongoing preparedness activities at facilities in New Jersey that house seniors to respond to natural disaster events. The literature described in Chapter 2 provides the theoretical grounding for the research questions examined. The literature addresses the importance of the topics. Chapter 3 describes the location(s) and general characteristics of facilities that house seniors in New Jersey and will highlight areas with higher proportion of senior facilities. Chapter 3 will review the process and methodology used for a mail push to web survey that was distributed from January 2017 through March 2017 to facility administrators as a baseline of preparedness at facilities across the State. The chapter also describes geospatial analysis that examines facility locations in proximity to, or in potential areas of, natural environmental hazard conditions such as blizzards, wildfires, tropical storms, etc. The methods employed in Chapter 3 examine two of the sub-questions of interest in this research. More specifically, the survey looked to understand how ownership (i.e. For-Profit vs. Non-Profit) and size of facilities may predict how prepared a senior facility will be to respond to natural hazard events. Spatial analysis was also used to explore vulnerability of municipalities and the senior facilities located within them through variables related to exposure to specific natural environmental hazard events. By developing a hazard assessment using retrospective and historic storm events, this research sought to understand which municipalities could be considered overburdened based on the number of natural hazard events that have impacted them in the past or potentially could impact them in the future.

Chapter 4 describes semi-structured interviews conducted with county emergency managers and senior facility administrators and executive directors from May 2017 through to September 2017. These interviews were conducted to explore experiences and lessons learned

from emergency managers as well as preparedness protocols in place at senior facilities. Chapter 4 will also describe facilities identified as having a potential risk from impacts of natural hazards, the process of how facilities were contacted for semi-structured interviews, the characteristics of facilities that agreed to be interviewed, as well as the general findings and outcomes from those interviews. The interviews described in Chapter 4 aimed at understanding what gaps are present in current preparedness and planning practices as well as whether there were any major identifiable differences between protocols in place at senior facilities based on their size and/or their association. The fifth chapter will provide a detailed case study of findings from an emergency exercise observation made at a nursing home facility in New Jersey. The final chapter, chapter 6, provides an overall summary of the dissertation and findings, outlines and explains limitations of the research, and offers some contributions for policy makers.

Chapter 2: Existing State of the Field and Contribution

Introduction

The primary question examined as part of this research is to what extent hazard preparedness and response planning is coordinated between emergency response agencies and senior facilities, and in what ways could communication and coordination be improved. The additional sub-questions examine issues of (1) characteristics of senior facilities, (2) vulnerabilities including perceived and unperceived risks, as well as (3) gaps in existing processes.

To examine these questions the literature review is organized around three main categories of thought:

- Perceptions of Risk (Slovic 1987, Olstedal et al. 2004, Patterson et al. 2010, Peek 2010, Bankoff et al. 2004),
- Organizational Management (Chess 2001, Busby et al. 2014, Howard 2012, Root 2007, Hyer 2010, Berry 2012, Qureshi 2001, FHCA 2015, State 2011, Sadiq & Graham 2015, Wood et al. 2012) and
- Risk Management for Senior Facilities (Hyer 2010, Howard 2012, Hyer 2012, Root 2007, State 2011, Santos et al. 2014, Berry 2012, Qureshi 2001, Hyer et al. 2007).

Perceptions of risk is a way to look at how people, and more specifically, senior populations and authorities perceive risks. This category will include topics such as social capital (Greenberg 2014b, Patterson et al. 2010), trust in authorities (Greenberg 2014b, Hyer 2010, Hyer 2012, Laditka 2008, Howard 2012) and communicating risk (Dunwoody & Peters 2016, Glik 2007) and describe how they contribute to an individual's or organization's perceptions of risk. This will help to provide a theoretical grounding to a facility or community's overall vulnerabilities including how they perceive risks. Organizational management will go a step further by examining risk perceptions from businesses and industries themselves as well as exploring the

literature to see what exists to explain what happens when organizational priorities are in contrast to an employee's personal beliefs or experiences.

The section on organizational management will also include conceptual maps (Wood et al. 2012) and reference a concept map developed to describe how this research has been organized. The last section, risk management for senior facilities, includes best practices and standards found within the literature and describes important considerations for facilities to understand and more specifically outlines how New Jersey fits into some of the ongoing preparedness efforts across the United States. Risk communication is again explored as a mechanism to improve ongoing preparedness and training efforts.

An individual's knowledge and experiences significantly guide their understanding of potential risks to their communities and personal heuristics can sometimes lead to cloudy choices and judgements being made (Patterson et al. 2010, Chess 2001). This literature review will also look at influences within the organizational framework of a senior facility including financial, safety, and human health. As an example, organizational liability, long-term business impacts, and the mortality of facility residents all play a factor in a facility's decision making during an emergency event in addition to leadership risk perceptions (Root 2007, FHCEF 2008).

Due to the level of knowledge and understanding impacting our own personal risk perceptions, risk communication then becomes an important element for encouraging organizations to enhance their level of effort in preparedness and response planning. However, through examining actions of organizations during historic disasters, we see that perceptions are again influenced by experiences (Chess 2001, Root 2007). The experiences observed through recent disasters have changed the government's perception of the senior facility sector's ability to respond to a disaster, as seen through widespread implementation of disaster preparedness

requirements across the country and can be linked to changes in organizational management strategies, and more specifically overall risk management (Levinson 2012). At the same time, the perceptions of senior facility administrators have questioned whether emergency response agencies have the ability to support them during large scale disasters, as addressed in the literature by examining social capital, risk perceptions and overall risk management (Root 2007, Laditka 2008, Howard 2012, Hyer 2013).

Past experiences with disasters have highlighted the need for heightened and improved collaboration between senior facilities and emergency response agencies to better prepare for the next disaster.

Table 2.1. Disaster Events

Event	Location	Year
<i>Nor'easter (Riley)</i>	United States	2018
<i>Hurricane Irma</i>	United States	2017
<i>Hurricane Harvey</i>	United States	2017
<i>Superstorm Sandy</i>	United States	2012
<i>Hurricane Irene</i>	United States	2011
<i>Hurricane Ike</i>	United States	2008
<i>Hurricane Gustav</i>	United States	2008
<i>Institute Explosion</i>	Institute, WV	2008
<i>'Witch Creek', 'Harris', etc. Wildfires</i>	San Diego County, CA	2007
<i>'The Georgia Bay Complex' Wildfire</i>	United States	2007
<i>Hurricane Rita</i>	United States	2005
<i>Hurricane Katrina</i>	United States	2005
<i>Tsunami</i>	Indonesia	2004
<i>Bhopal Disaster</i>	Bhopal, India	1984

This literature review assists in supporting the understanding of how risk perceptions are formed and specifically, how current perceptions in the senior care sector have been molded through review of recent disasters. The supplemental research questions posed as part of this paper have been examined initially by reviewing literature on theoretical approaches to improve risk communication and the findings of studies and reports on various disasters that would

contribute to enhancing planning and response coordination among stakeholders through each of the phases of emergency management (i.e. response, recovery, mitigation, and preparedness).

Perceptions of Risk

Advanced age is not a direct indicator that a person or persons are more vulnerable to natural disasters (Peek 2010). In fact, a person's prior experiences, income status, education competency, and overall social conditions will contribute to how they respond to pre-disaster messaging during the time of a natural hazard event (Peek 2010). With a larger aging population occurring around the world, emergency managers can leverage the experience and knowledge of older populations within communities for pre-planning disaster efforts by having those populations help in "identifying and reaching out to the most vulnerable members of the community" (Peek 2010, 176).

Risk perception is an individual's view of a risk, which may or may not be similar to evidence-based estimates (Oltedal et al. 2004). Risk perceptions are subjective judgments about risk that are grounded in social context and are individually activated by personal heuristics (i.e. mental models) that individuals construct to cope with life (Patterson et al. 2010). Narratives developed from society's interactions with the State in previous events can help to shape reactions and response to natural disaster events (Bankoff et al. 2004). Bankoff et al. described that "single disaster events can be seen as one of ordering elements that, over centuries, shape state-society relations" (page 61). For example, trust in the government is slowly eroding following failures and miscommunications during disasters such as Hurricane Katrina, Hurricane Irma and various wildfires (Root 2007, Laditka 2008, Howard 2012, Licon 2018).

Social capital (Greenberg 2014b, Patterson et al. 2010) and risk perceptions are two interdependent components of seniors' actions in preparation for, and in response to, a major

hazard event. Social capital represents the networks that people belong to and the value that accompanies those social networks in their daily lives and during times of need (Patterson et al. 2010). Social capital provides a mechanism to solve some of the existing problems with how risks are communicated and received by providing avenues for information to flow freely between parties who trust one another. Self-interest remains in this conceptual model but is also “moderated by a regard for the common good” (Patterson et al. 2010, 129). Typically, experts will evaluate potential risks and provide a ranked order or some other similar index to the public. This ranking is lost in translation once someone without a similar knowledge base reads and tries to interpret the findings.

Paul Slovic (1987) suggests a two pronged approach that allows experts to analyze and synthesize data, and also seek input from the intended constituency. This approach allows the constituency the ability to provide feedback about how they would like to receive such information and therefore continuing the contribution to the elements of social capital. By doing so, the audience may become more likely to buy into the process since they have invested time and provided contributions. In turn, this may gain the audience’s trust so that the message of risk would be quickly grasped and future response would be positively in favor of the people providing the communication messages. This type of approach is a recommended practice through the Federal Emergency Management Agency (FEMA) called ‘whole community’. In guidance released by FEMA, examples of using the whole community approach were identified. One example was the inclusion of the Somali population in community planning efforts within the state of Ohio. Home to the second largest Somali population, the Ohio Initiative identified preferred communication methods specific for this group of people and included passing along

messaging information through trusted Somali community leaders during emergency preparedness and response efforts (FEMA 2011).

Trust in the people providing guidance and oversight is an important aspect in response to what is being communicated (Greenberg 2014b). People routinely trust the immediate network around them (e.g. family, friends, and community organizations such as church groups) but many are wary of authority figures. Media can also play an important role in contributing to an individual's perception of risk. Trusted authorities can provide messaging of potential risks that are added onto the media agenda and pushed out through their networks to quickly spread information. Sensationalism, or the process of overstating a potential risk, is a complication of using the media as a primary method of disseminating important information about a particular event or risk (Dunwoody & Peters 1992). In their study of mass media coverage of environmental risks, Dunwoody and Peters (1992) evaluated how media used information to reinterpret events to tell a more interesting story. They explained how media often times did this by creating misinformation and found that “media clearly regard governmental sources as appropriate ones during hazardous situations” (Dunwoody & Peters 1992, 203).

Communicating risk is one of the most important aspects within each of the four phases of emergency management (i.e. mitigation, preparedness, response, recovery). Authorities, such as local emergency managers or other government actors, play a crucial role in communicating potential risks to the populations they serve. How successfully a message is received is contingent upon how well the authority producing the message understands their audience and also how that authority is perceived or trusted by the receiver. During times of response and recovery, the risk communication is considered to be “geographically specific and time bound” (Glik 2007, 34) whereas within the mitigation and preparedness phases the communication of

risk can be characterized more as “a set of practices and relationships” (Glik 2007, 34). These “planned risk communications” (Glik 2007, 35), are often times a common part of institutional cultures and housed within the organization’s risk management program. They also require that the intended audience has full confidence that whatever information the organization releases is true and depending on the severity of the message, responds accordingly.

The public’s perception of risk has a strong association with the action(s) that are taken or the behaviors that follow a received message of risk. Perceptions of risk, and not the actual risk itself, will determine how a person responds to a certain hazard (Glik 2007, 37). If the hazard is manmade or is known to cause mass destruction or illness, then a heightened response is likely within areas of close proximity to that hazard. At the same time, if the public’s perception of risk is heightened to the point that it produces an emotional response then there is a possibility of the risk creating resistance to receiving messaging about appropriate actions that should be taken. Communicating risks clearly to the public will help with any “mental noise” (Glik 2007, 36) that may be distracting them from recommended actions.

Seniors that reside within institutionalized facilities comprise a network similar to one seen within a functional family. In institutionalized facilities, seniors are surrounded by people they must trust to receive information. Seniors believe that these authorities will provide needed supplies and support during a disaster event. However, their trust may be overstated because facility staff may not have the needed resources or training to meet the needs of their residents.

In 2005, 103 long-term care residents lost their lives in Katrina. A month later, 23 residents passed away while evacuating during Hurricane Rita (Hyer 2010). More recently, 12 individuals lost their lives sheltering-in-place during Hurricane Irma in Florida (September 2017), and an individual lost his life while being evacuated during Hurricane Harvey in Texas

(August 2017)(Florida House of Representatives, Select Committee on Hurricane Response & Preparedness 2018, Associated Press 2017). The controversies surrounding these events continue as, “Recurring controversies in the news over the past decade have raised serious questions in the public mind about the ability of facilities that care for the elderly to make the best decisions when a disaster occurs or is imminent” (Hyer 2012, 43). This perception may be exacerbated by long-term care administrator’s perception of trust in government authorities. Following Hurricane Katrina in 2005, the perception of the government’s ability to support long-term care facilities decreased (Root 2007, Laditka 2008). As disasters continued over the next decade, that trust was reduced further as resources under contract with facilities were called upon by government and utilized for other response operations (Howard 2012). Similar circumstances were also reported after Superstorm Sandy (i.e. October 2012) impacted New Jersey, where one facility during the interview portion of this research indicated they had housing contracts in place with a local hotel only to find that a federal agency had occupied the same units before an evacuation was needed at the senior facility forcing the senior facility to find last minute alternate arrangements.

Government expectations and trust were also issues in Florida during Hurricane Irma in 2017 (Licon 2018). Specifically, studies have shown that specialized equipment to transport seniors with physical disabilities may not always be available, and onsite staff may not be enough to assist with the number of residents during an evacuation (Peek 2010; Howard 2012). Furthermore, power can fail and emergency generators may not be available. Loss of power and rising temperatures were the cause of death to 12 facility residents during Irma (Florida House of Representatives, Select Committee on Hurricane Response & Preparedness 2018). Access can be cut off during a disaster, and staff and other needed resources may not be able to reach the

facility to provide support (Hyer 2010). Failures such as these may further intensify negative perceptions of facility preparedness.

Organizational Management

Perceptions of risk and trust in authority are two large topics well described by the literature. Risk perceptions most notably hold a lot of importance within the chemical and industrial manufacturing sector where populations located in and around the areas of industrial facilities have been and continue to be concerned about public safety. Caron Chess takes these issues a step further looking at it through the lens of the organizations themselves and what actions or protocols are developed based on the perceptions of organizations. She poses that “organizations’ perceptions of their reality are shaped by what companies choose to notice in their external environments and how they understand events;” she then asks the question of whether ‘perception of the environment’ is the summation of perceptions of individuals in the organization, of powerful leaders, of units within organizations, or of organizations as a whole? (Chess 2001, 181). The author used the events at Bhopal, India (December 1984) and Institute, West Virginia (August 1985) to explain how certain events can move the development of risk strategies along faster to help increase an organization’s ‘legitimacy’ as well as encourage industry adaptations. Both events represented major chemical leaks involving chemicals that caused harm to residents in nearby areas. In the example of Institute, West Virginia a cloud of combination chemicals used to produce pesticides was released into the air, one chemical of which was Methyl isocyanate (MIC), which was the gas that was also released from another Union Carbide plant in Bhopal, India that killed approximately 10,000 people less than a year earlier (Franklin 1985). Chess describes that “an organization’s actions can influence socially constructed notions of legitimacy as well as be influenced by societal expectations” (Chess 2001,

184). This in turn is where “industry both created and responded to the environment; organizations are not passive receivers of pressure from their environment, they are also powerful creators of the conditions under which they function” (Chess 2001, 184).

Busby et al. (2014) describe the process of “sensemaking” as a means for organizations to take their defined perceptions of risk and develop strategies to mitigate against them. They describe that sensemaking is “closely aligned with the idea of risk itself as a construction that brings a sense of coherence to the variability and unpredictability of harmful events, and especially the notion of risk as a social construction in which the things we identify as risk objects come out of a social process of getting to grips with a technology” (Busby et al. 2014, 1739). Therefore, an organization led by individuals who have experienced disaster events construct their perceived risks around the idea that disasters potential events that may impact them directly. This retrospective outlook focuses on past experiences. As leadership goes through the process of interacting with staff to address disaster planning, experiences by those at the organization become socialized culturally. An organizational identity is created lending organizations to be more likely to develop mitigation strategies against those risks. Conversely, organizations and managers with limited experiences or social cues may put less emphasis on disaster planning because the direct impact from a disaster is perceived to be low, regardless of the accuracy of this perception. This is supported by findings that suggest facilities that face constant threat of disaster are more prepared than those which are not confronted with disaster threats on a regular basis (Howard 2012).

Is a major event needed to spur development of risk mitigation and communication strategies in organizations? Literature and history has suggested that small moves towards planning for and reacting to environmental crises may occur on an individual organization basis

but after a large event where public stigma becomes involved, larger movements within and between organizations are made. This is reflective in the response many organizations took after the 2004 and 2005 hurricane seasons impacted the Gulf Coast where various strategies had been considered to alleviate pressures on staff to ensure staffing levels were as high as possible to assist in disaster preparedness and response (Root 2007, Hyer 2010, Howard 2012, Berry 2012).

Understanding an organization's risk is only one aspect to organizational risk management. According to Chess et al. (1992) "organizational learning, information flow within organizations, crisis management, organizational culture, and organizational structure" (page 432) are the primary components of a complete and cohesive risk strategy. How successfully those risks are shared and communicated within the organization and outside of the organization is what helps to develop a complete risk management plan.

The Florida Health Care Association (FHCA) held a hurricane summit in 2006 following the devastating 2004 and 2004 hurricane seasons. Findings included communicating to staff about the risks the facilities could be impacted from as well as setting expectations upon hiring related to an individual's roles and responsibilities and whether they were designated as essential personnel. These expectations are continually outlined within an organization through ongoing trainings and exercises (FHCA 2015, Howard 2012, Hyer 2010, State 2011).

Implementation of risk controls through social organizations has proved to successfully reduce an organization's risks to lower levels (Busby et al. 2014). The use of an environment of learning representing examples of both successful and flawed risk mitigation can provide an open environment where ideas are shared and quality control is part of the ongoing process within the workflow of the organization. However, this environment of "organizational

learning” can “ignore the fact that what gets learned is often what protects the parochial interests of powerful individuals such as senior managers” (Busby et al. 2014, 1740).

Many states, including New Jersey, require facilities submit their emergency plans for review by their local emergency preparedness agency (State 2011). For New Jersey, this is in order to receive a letter of review stating that an emergency preparedness agency has received a copy of a facility’s plan but has also had an opportunity to review the content and request any needed changes. “Some states, including Florida and New York, have checklists and online state registries that require facility administrators to update specific details of the plan, including personnel names and contact information, within 30 days of a change in facility leadership” (Hyer 2012, 45). Others, such as Maryland, do not require submission to authorities but plans must be presented upon request by local authorities (State 2011). However, it should be noted that in one study, “participants were largely unaware of State regulations governing nursing homes during a disaster or public health emergency” (Root 2007, 3).

Overall, organizational preparedness according to Sadiq and Graham (2015), has very limited literature on the predictors that determine how prepared organizations will be to respond to disasters. While the authors indicate they have seen an increase in the literature on preparedness research at the organizational level they explain that the literature’s findings are “based on samples that are small, restricted in geography, sometimes restricted to one type of organization and thus not easily generalizable” (Sadiq & Graham 2015, 2).

Conceptual maps can be used to distinguish similarities and differences “between perceptions and beliefs of management organizations” (Wood et al. 2012, 1334). The concept map allows for hypotheses to be developed and then a protocol to be distributed to understand whether the findings show proof that the hypotheses are true or if other factors should be considered in

addition to what has been outlined. The outcomes of the outreach to stakeholders can then be analyzed through content analysis or other similar methods, to determine if there are other characteristics of knowledge and beliefs that should be included. “Mental model diagrammatic representations can assist individuals when reasoning and making inferences, and aid understanding of group perspectives. Both of these are important for risk managers, who must make judgements about the best policy or course of action to take given imperfect information about the beliefs and perceptions of several stakeholder groups” (Wood et al. 2012, 1335). The concept map developed in the beginning stages of this research and used to guide the overall research process is shown in Chapter 1 (see Figure 1.2).

Risk Management for Senior Facilities

As the elderly population increases and baby-boomers begin to age in place, demands for better long-term care within senior facilities will tangentially gain an increased focus. In some of the more socialist societies (i.e. Norway), senior living facilities are often a source of political contention and the focal point for elected officials on how to manage care and provide the best services to a population in need. Within the United States, these same people are often discussed on the basis of economic perspectives (i.e. reducing costs by limiting benefits of care) rather than how to improve long-term care for both seniors living independently, and those living in dedicated assistance facilities. The people living within senior facilities are often overlooked to those on the outside and are considered under the auspices of the facility’s themselves.

While the United States federal government focuses on the reduction of risks to reduce overall losses from disasters, it is ultimately the local jurisdictions that have the most influence on the placement of a facility and what is required to maintain compliance for occupancy. One of the largest gaps identified in prior studies is the lack of senior facilities involvement and

integration into community planning (Hyer 2010, Howard 2012, Hyer 2012, Root 2007). This is why, coordination is now being legislated (State 2011) and planning efforts in emergency management and all hazard plans now include a component for communication and collaboration with senior facilities.

Senior facility management are faced with tough decisions when a natural disaster is impending. Concerns about resident and staff safety, liability, judgment are all complexities a facility manager faces when making a decision (Root 2007). This concern was most recently highlighted with the death of 12 residents in a Florida nursing home which chose to shelter-in-place home were ruled homicide (Florida House of Representatives, Select Committee on Hurricane Response & Preparedness 2018). They are limited to choosing to shelter in place or to evacuate their residents. Both sheltering-in-place (i.e. keeping residents where they are through the duration of the storm), or evacuating residents to another safer location have implications that could affect the health and wellbeing of their residents (Hyer et al. 2007). Sheltering-in-place, from the perspective of health care providers, is the preferred method when possible, but is cost intensive and requires hardening of buildings (i.e. roofing, siding, and windows that can handle strong rain and winds) and systems, and access to constant electrical power and resources (i.e. staff, food, water, medicines) (Hyer et al. 2007).

Sheltering-in-place, when backup power exists at a facility, has been shown to be less obtrusive to residents in comparison to the process of evacuation. However, decisions need to be made in context of each unique threat. For example, multiple facilities decided to shelter-in-place during Katrina. This resulted in more than 100 residents passing away; where 35 and 34 individuals died in two separate facilities respectively (Hyer 2010). Additionally, residents can be isolated, exposed to flooding, reside in damage structures for prolonged periods, may not have

access to food and water beyond what is onsite, and may be without power should impacts from a disaster prove significant (Hyer 2010). These critical life safety considerations were once again recognized during the 2017 Atlantic hurricane season. The 12 residents who passed away at the Rehabilitation Center at Hollywood Hills succumbed to heat exhaustion due to loss of power; and it wasn't until an image of residents in waist high flood waters was circulated via social media that residents at La Vita Bella Nursing Home during Hurricane Harvey were rescued (Florida House of Representatives, Select Committee on Hurricane Response & Preparedness 2018, Milstein & Rosenbaum 2017). Hyer (2012) examined impacts and responses from four hurricanes in both Louisiana and Texas (i.e. Katrina, Rita, Gustav, and Ike). The research showed that residents evacuated from senior facilities were more likely to have higher post-storm death rates and hospitalizations when compared to senior facilities where residents sheltered-in-place. The conservative estimate from the research stated that “94 ‘excess’ deaths were due to evacuations resulting from those four storms” (Hyer 2012, 10). Similar results were found when examining senior facilities during Hurricane Gustav specifically. The risk was again highlighted in 2017 after residents were evacuated due to Hurricane Harvey in Texas (Associated Press 2017). The research found “increased death rates for those severely cognitively impaired residents who were evacuated” (Hyer 2012, 11). The research reiterated that shelter-in-place is preferable to evacuation understanding that circumstances will depend on an individual event and “assuming the building remains safe and inhabitable” (Hyer 2012, 47).

Risks to senior facilities can be reduced through the engagement of “cooperative planning and practice” where up-to-date plans are developed and exercised to “gather lessons learned for continuous risk reduction (Greenberg 2014c, 50-51). This is similar to organizational learning where organizations learn from past experiences and improve their current practices by

integrating in new processes identified through lessons learned. However, administrators should consider their facility plan, evacuation orders, acuity levels, transportation resources, shelter location and care levels and residents and their families upon making a determination of whether to evacuate or shelter-in-place (FHCA 2015).

A facility's workforce is one of the most important dimensions to consider when developing a successful plan. Santos et al. (2014) suggests that a behavior analysis of both a community and its general workforce during the time of a disaster event are important considerations when planning for future disasters (page 1062). Prior studies have found that workforce behavior may be anticipated as negative for organizational management (Berry 2012, Qureshi 2001). Some barriers identified included child care and elder care issues (Qureshi 2001). The results of this analysis can help to highlight important elements to keep in mind as part of the evacuation or sheltering plans. For example, agencies allowing staff to shelter family at the facility have become part of identified solutions to keep peace of mind among employees (Root 2007, Hyer 2010, Howard 2012).

Minimizing disruptions caused by a disaster event is important to maintaining as close to normal operations as possible. Often times plans call out what to do if the workforce encounters "severe illness, public infrastructure damage, and communication outages, but lacks the consideration of conditions of mental health or emotional well-being" (Santos et al. 2014, 1062). Senior facility administrators should also become familiar with emergency management procedures and terminology at a high level so they can communicate needs clearly to the local emergency management coordinators. This operational knowledge should include information such as the Federal Emergency Management's (FEMA) National Incident Management System per a recommendation from the Centers for Medicare and Medicaid Services' Emergency

Preparedness (Hyer 2012, 45). Some states go as far as identifying which hazards facilities must address in their plans (State 2011).

In New Jersey, hazard plans are required by the State for senior facilities, which helps to inform the facility's staff and administration of potential risks that exist in their specific location(s). These plans must be shared with and signed off by the local emergency manager. While evacuation of residents is typically included as part of these emergency plans it is often times more appropriate or the preference of the facility manager to shelter in place rather than evacuate and disrupt or potentially upset the residents of a facility (Greenberg 2014c, 66). Even under mandatory evacuation orders, senior facility managers and owners would be able to make the decision to evacuate or not and would provide the necessary justifications to emergency managers to back up their decisions.

Under circumstances of a mass evacuation, where multiple facilities would require evacuation at the same time, it is the assumption of many that facilities will rely on their own or contracted resources to evacuate (Healthcare Annex 2013). The New Jersey Department of Health (NJDOH) is tasked with inventorying facilities that will potentially be impacted by an impending natural disaster event. Previous work from the NJDOH has identified five New Jersey public health regions. Prior to Hurricane Irene in 2011, the NJDOH worked with counties in public health region "South" as well as through private healthcare facility owners to develop a plan to address multi-facility evacuation operations. The South region is comprised of: Atlantic, Burlington, Camden, Cape May, Salem, Cumberland, and Gloucester Counties. In meetings after Hurricane Irene, those involved with the operations plans unanimously agreed that the pre-planning done prior to the storm was very successful. As a result, the NJDOH began efforts to expand these types of planning efforts in the remaining counties in the Southern region as well as

to begin the development of similar plans and agreements with facility operators located in neighboring counties of the state. The density of facilities in the northern part of the state has been identified as a challenge by the NJDOH.

Hazard plans should include information such as a facility's proximity to a flood zone, the current elevation of the building, age of the building, and whether any protective measures exist within the building structure (i.e. vinyl windows, roofing type) (Hyer et al. 2007). This information can help to inform a facility about their existing risks, providing them the necessary tools to develop response and recovery plans for their institutions, and most importantly, for their residents. Hazard plans for facilities need to include a substantial risk management component that outlines the potential risks the facility could be exposed to or could experience (Hyer 2012). Those risks are then analyzed and classified into categories of types of risk and include protocols that should be implemented to plan and control. As an example, risk assessments developed for senior facilities should involve an inventory of all residents with special needs and those that would require special assistance during an evacuation. Supplies for the residents with and without special needs should be catalogued, and staff should be educated about how to access and use those supplies during a disaster event. Facility managers are responsible for building relationships with stakeholders or vendors to secure access to resources before an event occurs (FHCA 2015). This includes opening communication channels with local emergency officials (e.g. fire, police, and hospitals) as well as other private facilities (e.g. hotels, fuel suppliers). Financial planning with disaster contingencies are another way to prepare for potential risks with hazard planning. It is recommended, by organizations associated with senior facilities such as LeadingAge, that ten to fifteen thousand dollars in cash reserves be located somewhere on site at

a facility to allow for the purchase of needed supplies, should an evacuation be needed (LCS 2012).

A critical component of a risk management plan is the communication plan. This portion of the plan will outline how staff, residents, and their families will be notified leading up to and during an evacuation. Staff, residents, and families should be included in the development and implementation of the communication plan in order to clearly identify what their role will be in the time of an emergency (LCS 2012). It is also recommended, by organizations supporting senior facilities, that facility managers inform their residents and families about where to find information quickly should an event occur. This includes setting up a website and call center as a way to provide updates and ensure accurate information is provided to those who need it (LCS 2012). Facility emergency preparedness and response information may also be provided during the initial admissions process of new residents (Howard 2012). Review and discussion of emergency plans with both the residents and their families may provide initial information on what to expect during an emergency event (FCA 2015). Disseminating call center resources and website information to staff, residents, and their families prior to an event will ensure clear points of communication are established and understood. This should include ongoing and pre-event maintenance of family contact numbers to include cell phones (FHCA 2015). Updates should frequently be provided through several channels (e.g. call center, website, and social media) even if the status hasn't changed much from one update to the next.

For much of the United States, Hurricane Katrina was a wakeup call for senior facilities with federal agencies calling for stricter national standards for emergency preparedness efforts. Hyer (2012) indicates that the present state of nursing home preparedness is “mixed,” meaning that some areas are doing more than others.

In recent years, community planners and administrators of facilities for the elderly have made considerable progress toward better planning, staff training and community integration. Yet, many facilities continue to be ill-prepared in large or small ways, and local emergency officials continue to overlook the specific needs of senior care facilities and their residents. Recognizing their vulnerability on this issue, many providers have collaborated with each other to reduce redundancy and enhance self-sufficiency (Hyer 2012, 9).

A recent federal rule, released by the Centers for Medicare and Medicaid Services (CMS), requires facilities who receive Medicare or Medicaid funding to comply with stricter guidelines related to emergency preparedness. The CMS rule was released in September 2016 and was fully implemented in November 2017, and includes a variety of healthcare facilities such as hospitals, dialysis centers, nursing homes and long-term care facilities that are now required to have developed emergency preparedness procedures and associated documentation. This Final Rule (81 FR 63860, Sept. 16, 2016) “establishes national emergency preparedness requirements for participating providers and certified suppliers to plan adequately for both natural and man-made disasters, and coordinate with Federal, state, tribal, regional and local emergency preparedness systems” (CMS 2017, 2).

The literature on the various disasters and related experiences of stakeholders highlight the need to continue improving senior care industry emergency preparedness. The theoretical approaches based in organizational risk management provide an opportunity to view existing and needed preparedness activities through the risk management lens. Using this theory as a frame of reference, this research will analyze the preparedness requirements of senior facilities, characteristic predictors of facility preparedness levels, and the level of coordination between emergency management and senior facilities.

Chapter 3: Quantitative Analysis

Overview and Study Area

The literature described in Chapter 2 outlines a theoretical base for examining the methodology for this research. Using concepts from organizational risk management (i.e. identifying, analyzing, classifying, and controlling risks); I reviewed the presence and repetition of policies and protocols in place at senior facilities for the management of risks due to environmental natural hazards. This research focused on three aspects:

- 1) what requirements exist for planning and mitigating risks related to environmental natural hazards such as fires, flooding, blizzards, and tropical systems including hurricanes as a way to examine the sub-question of this research aimed at understanding how senior facilities located in specific areas of the State may increase a municipality's potential impact from natural environmental hazard events;
- 2) what characteristics, if any, of a facility may predict whether a facility would be better prepared for an emergency event examining a facility's size and/or association; and
- 3) what the overall level of coordination was between senior care facilities and local emergency management in the development and implementation of their hazard management plans.

New Jersey consists of 21 counties with 565 municipalities. New Jersey is a home-rule state where cities, townships, boroughs, and villages are, under normal circumstances, given equal standing to govern as they choose within their political boundaries. In the case of a mass evacuation, where multiple facilities would require evacuation at the same time, it is the assumption of many emergency managers that facilities that house seniors will rely on their own or contracted resources to evacuate.

Figure 3.1 below provides a map that identifies the locations of senior facilities in New Jersey. There is a high level of clustering of facilities (i.e. facilities located close to one another) along major roadways. More specifically, there is a clear pattern on the northeast coast that follows proximate to the NJ Garden State Parkway. A similar pattern can also be seen along other roadways such as the NJ Turnpike that runs southwest to northeast from the southern end of the State; as well as along the Atlantic City Expressway that runs west to east on the southern part of the State.

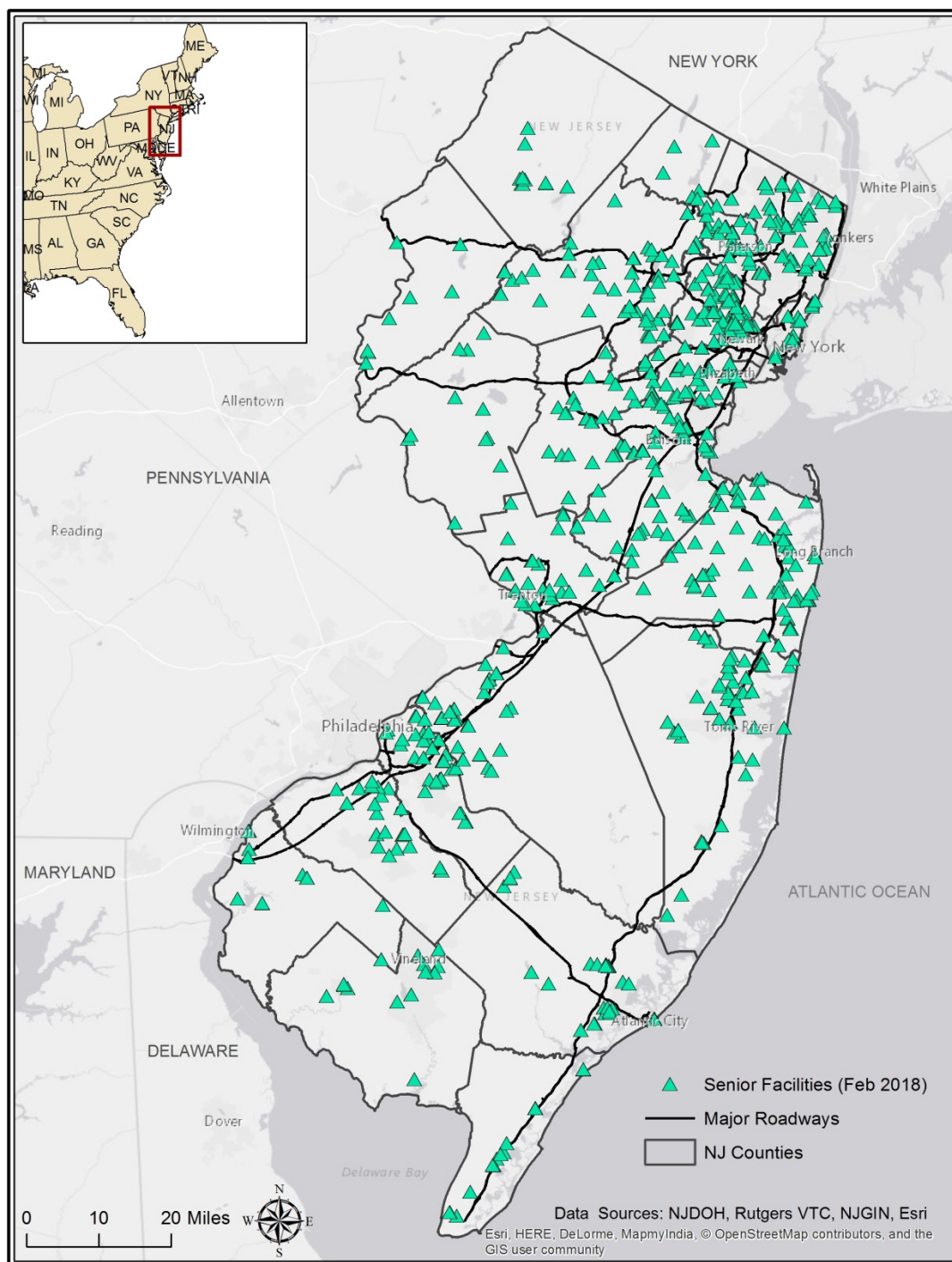
A noticeable gap is present in the south central part of the State, in the area named the New Jersey Pinelands. This area contains a combination of farms, forests, and wetlands that span 56 communities and cover more than one million acres. This area is federally classified as “a United States Biosphere Reserve and in 1978 was established by Congress as the country’s first National Reserve” (National Park Service Website 2018). The Pinelands is also an area with high potential to wildfires because of the dense brush that covers the landscape.

The northwest parts of the State consist of the higher elevations due to the presence of mountains. While senior facilities are still located throughout this region, they are limited when compared to other parts of the State. This could be due, in part, because of access issues to needed resources required of senior care facilities.

Table 3.2 (page 39) highlights the total population, population density, and total population 65 years or older by region of the State. The spread of senior populations is fairly even across the State ranging from 14% in the northeast to 16.7% in the central east region. Individually by county, the senior population range goes from 11% of the total population in Hudson County to 25% of the total population in Cape May County. However, there are two

identifiable clusters of senior facilities specifically located in the northeast (14%) and southwest (16%) areas of the State.

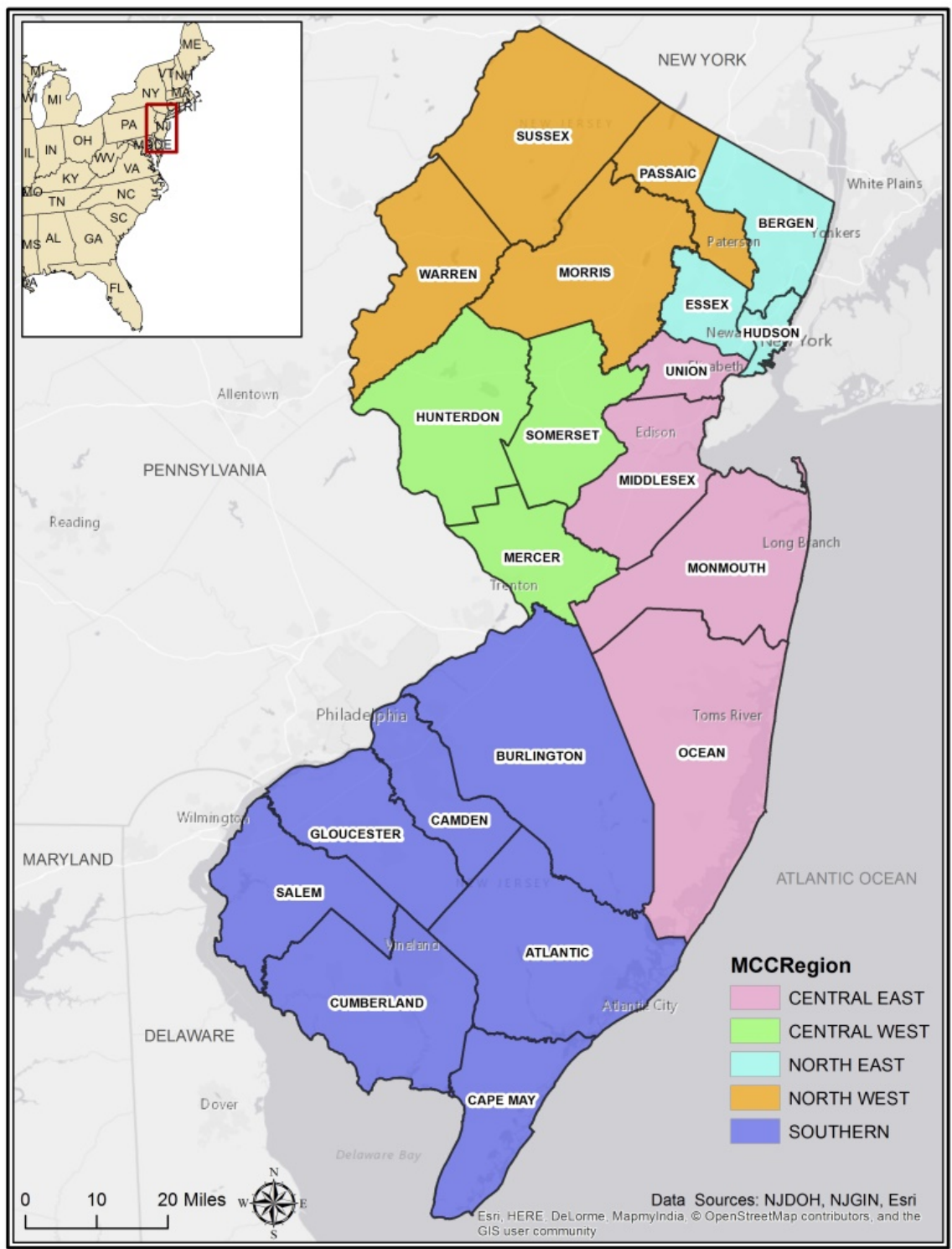
Figure 3.1. Locations of senior facilities in New Jersey



The New Jersey Department of Health (NJDOH) has taken on the task of inventorying facilities that will potentially be impacted by an impending natural disaster event. Previous work from the NJDOH has broken up New Jersey into five public health regions also known as Medical Coordination Centers (MCCs). These regions or MCCs allow for public, private, and academic entities to come together to “maintain regional situational awareness specific to healthcare and public health to monitor the impact, or potential impact, of an event on regional healthcare facilities or general public health” (RWJ Website 2018). The five regions consist of the following counties:

- Central East: Middlesex, Monmouth, Ocean, and Union
- Central West: Hunterdon, Mercer, and Somerset
- North East: Bergen, Essex, and Hudson
- North West: Morris, Passaic, Sussex, and Warren
- Southern: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Salem

Figure 3.2. Breakdown of the Medical Coordination Center (MCC) Regions in New Jersey



Prior to Hurricane Irene, the NJDOH worked with counties in public health region “South” as well as through private healthcare facility owners, to develop a plan to address multi-facility evacuation operations. The South region is comprised of: Atlantic, Burlington, Camden, Cape May, Salem, Cumberland, and Gloucester Counties. In after-action meetings (i.e. debrief meetings) following Hurricane Irene, those involved with the operation plans unanimously agreed that the planning done prior to the storm was very successful. This was also similarly heard during the in-person interviews with emergency managers in the same region. Similar results were identified by Blanchard & Dosa (2009) and outlined by Pierce et al. (2017). That is, facilities that had experienced evacuations during Hurricane Katrina (i.e. August 2005) felt an improvement in confidence in overall level of preparedness for Hurricane Gustav (i.e. August 2008). As a result, the NJDOH has continued efforts to expand these types of planning efforts (e.g. information workshops, exercises) in remaining counties in the Southern region as well as the development of similar plans and agreements with facility operators located in neighboring counties of the State.

Other parts of the State (i.e. Northern Counties) have not had the same level of coordination and overall engagement. As of 2017, more efforts were being made by the NJDOH to hold information sessions for senior facility administrators and emergency managers in the north and central regions of the State. I had the opportunity to attend one of these information sessions in Union County, and observed a strong attendance by facility administrators and directors of operation.

Quantitative Analysis Methodology

In January 2017, a mixed-mode non-incentive survey was initiated, specifically by using the mail push to web methodology (Dillman et al. 2014). A two-contact “postal mail implementation strategy” was used (Dillman et al. 2014, 435). This strategy included a two-part hard copy mailing with a follow up by electronic mail. The New Jersey Department of Health (NJDOH) Long-term Care (LTC) Inspection Database was downloaded in November 2016 and used to identify points of contact for mailing addresses as well as electronic mail addresses to serve as a follow up to the hard copy mailings that were sent through the United States Postal Service. A letter of support provided by the NJDOH was included as part of the hard copy initial outreach letter for the survey. The initial mailing (i.e. first contact mailing) reached out to senior care facilities in New Jersey to let them know about the upcoming study:

Dear _____,

In the next few days to a week, researchers from the Bloustein School of Planning and Public Policy at Rutgers University will contact you to request your participation in a study to better understand preparedness of facilities that host senior citizens in New Jersey to respond to natural hazard events. We are reaching out prior to the release of the questionnaire because we have found that people like to know when and why they will be contacted.

We have spoken with the New Jersey Department of Health – Emergency Preparedness & Operations Department who are fully supportive of this research. We have included a letter of support from this agency that show they are aware of this research and agree with its level of importance.

Less than one week after the initial outreach letters were mailed out, a second round of letters (i.e. second contact mailing) providing background into the research study as well as the website link to access the survey were mailed out to the same facilities:

Dear _____,

Within the past decade, New Jersey has been involved in 17 federally declared environmental disaster events by the Federal Emergency Management Agency. Of those 17, three have been major tropical-induced events that made direct or indirect landfall in the State. The most recent extra-tropical system (i.e. Superstorm Sandy) made direct landfall along the southern part of the New Jersey coast and caused more destruction than some municipalities had seen in all prior events combined.

I am writing to ask for your help in improving our understanding of preparedness of those that house seniors to respond to natural disaster events.

The brief questionnaire should take approximately 15 minutes to complete and can be accessed by going to the following website on your computer:

https://rutgers.qualtrics.com/SE/?SID=SV_7NU6AjHZDK3Ywdf

If you prefer to have a paper copy mailed to you please let us know and we will send one along with a postage paid envelope.

The survey was active for ten weeks from January 23, 2017 to April 3, 2017. Five hundred and ninety-five mailing addresses were identified and pulled from the NJDOH Long-Term Care Facility online registry database. Between the two contact mailings, 1,190 letters in total were mailed out. On January 29, 2017, six days after the survey was open, an email was sent to all facilities in the database reiterating the background and intent for the research study and provided a hyperlink to access the survey on the web. A reminder email was sent to the survey population approximately two weeks before the survey closed as follow up to the initial mailings and original email that provided access to the survey website.

The research was performed in accordance with the ethical standards set forth by the Institutional Review Board (IRB) at Rutgers University. For the survey and semi-structured interview part of this project, I received Rutgers Internal Review Board (IRB) approval through an application of an expedited review of Category 2. This category is described as involving “the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior” (Rutgers IRB website, 2015).

Survey Analysis and Findings

The survey consisted of 28 questions focused around three major themes: 1) characteristics of facilities, 2) attributes of their emergency plans, and 3) preparedness activities. One hundred and four respondents agreed to participate in the survey as recorded by the initial IRB disclaimer

The survey population was 504 possible facilities after removing non-respondents from both mailings and e-mail. A non-response was recorded if a hard copy mailing was returned back (i.e. “returned to sender”) or if an automatic e-mail response was received that the email address was no longer valid. Table 3.1 outlines the breakdown of possible participants through the process described above.

Table 3.1. Survey Breakdown

Survey	Total
Total Facilities in New Jersey ²	644
NJDOH LTC Database (2016) with contacts	595
Non-responses (i.e. Non-Contact)	91
Web responses received	110
“Yes” responses from survey	104
Response Rate ³⁴	20.4%

The final response rate was calculated using the American Association for Public Opinion Research’s Response Rate Calculator. The response rate was calculated using the following formula:

$$=I/(I+P) + (R+NC+O)^5$$

Where:

I = Complete Interviews

P = Partial Interviews

R= Refusal and break off

NC = Non-Contact

O = Other (i.e. Eligible, Non-interview)

² Based on 2017/2018 database update completed as part of this research to include LTC, Assisted Living, and Nursing Home facilities.

³ American Association for Public Opinion Research (AAPOR) Outcome Response Rate Calculator was used to calculate response rate. Accessible at: http://www.aapor.org/AAPOR_Main/media/MainSiteFiles/Response-Rate-Calculator-4-0-Clean-18-May-2016.xlsx

⁴ Full Response Rate Breakdown shown below.

⁵ Portions of the equation that were automatically cancelled out were not included.

$$\begin{aligned}
&= 104/(104+0) + (0+91+309) \\
&= 104/(104) + (400) \\
&= 104/504 \\
&= 0.204 \\
&= 20.4\%
\end{aligned}$$

Response rates have seen a steady decline industry wide without a clear understanding for overall decline (Baruch & Holtom 2008, Manfreda et al. 2008). Baruch & Holtom (2008) examined 490 studies involving surveys published from 2000 to 2005 in academic journals. They found that the “average response rate for studies that utilized data collected from organizations was 35.7 percent with a standard deviation of 18.8” (Baruch & Holtom 2008, 1139). Their study concluded that “it is clear that studies conducted at the organizational level seeking responses from organizational representatives or top executives are likely to experience lower RR [response rates]” (Baruch & Holtom 2008, 1155). Manfreda et al. (2008) examined web-survey methods in comparison to other survey methods and determined that web-surveys were found to have an 11% lower response rate on average versus other modes with a 95% confidence interval (page 8). This study utilized the web-based survey mode based on its relative ease of use for respondents and its low overall cost.

Another possible reason for the lower response rate received could be based on the sensitivity of the survey material. Senior facility administrators are often concerned with how they [the facility] are perceived by the NJDOH. Specifically, they are concerned about the regulatory program within the NJDOH. Early on in this research, this sensitivity was stressed to me and that I would need to distinguish this research as something separate from what could count against facilities for their yearly inspections. I tried to achieve this in the approach I took throughout this research as well as through a pilot test of the approach.

The study population for this research was defined as administrators and executive staff that work for facilities that house seniors in New Jersey. The population would not be responding to the survey based on their individual opinions or experiences, but instead as a representative of their overall organizations which may have influenced how and with what frequency they responded (Baruch & Holtom 2008, Busby et al. 2014, Chess 2001). Table 3.2 outlines the number of possible facilities per MCC region including population and population density, as well as average sizes of the facilities. It also outlines respondents per region and how they compare to the overall populations for the regions.

Table 3.2. Comparison of MCC Region and Respondent Facility Statistics*

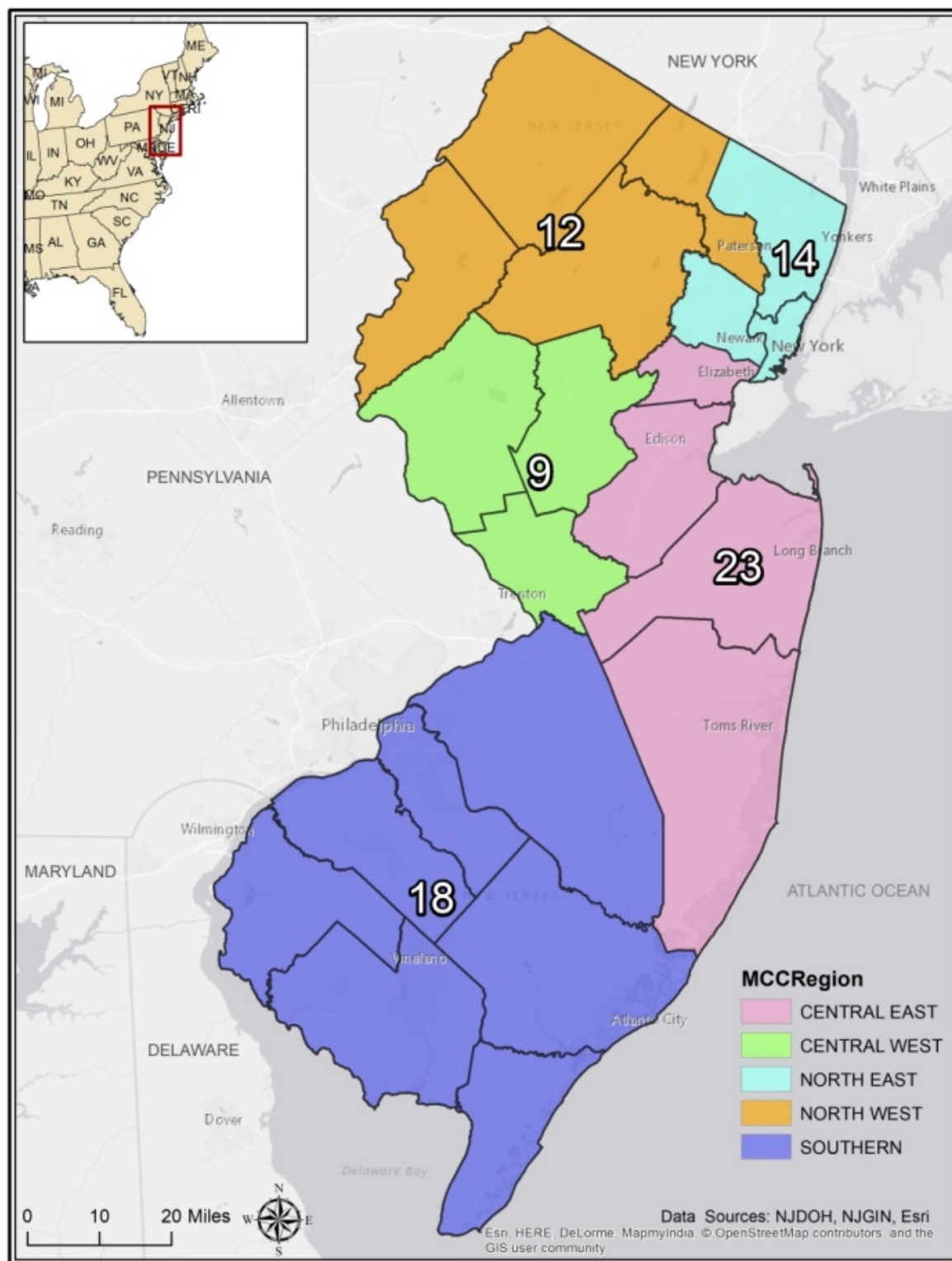
MCC Region	Population (2016 ACS 5-year)	Population Density (persons per sq. mi.)	Population Over 65 years (2016)	Size- bed count (mean)	Total Responses	Respondent Facility Size (essential staff** totals)
Central East	2,595,986	1,663.48	432,241	23,692(116)	23	450
Central West	828,495	853.24	124,826	8,302(105)	9	933
North East	2,391,422	5,679.26	336,837	16,463(131)	14	1,899
North West	1,257,208	796.80	191,503	10,805(113)	12	758
Southern	1,842,345	588.65	295,509	16,518(118)	18	959
Outside NJ	-	-	-	-	28	-

* Source data from the US Census American Community Survey Website along with totals from survey.

**Essential staff are staff members who would be needed (i.e. called in to work) during the time of an emergency event.

The North East MCC represents the region with the most population density, the Central East MCC was second. Approximately 30% of respondents were facilities located in the Central East region, with 18.4% from the North East region.

Figure 3.4. Survey respondent locations within New Jersey



The survey consisted of 28 questions set up as a majority of multiple choice questions with two open ended questions (i.e. number of emergency exercises and essential personnel, respectively). One hundred and four responses were recorded as full or partial responses to the questionnaire. Ninety-nine records of the 104 were moved forward for additional cross tabulation runs as part of the overall survey statistical analysis because of full responses being recorded. Figure 3.4 above shows where 76 of the 104 recorded responses were located. The remaining respondent locations were identified as far out as Wichita, Kansas but mostly clustered around the New York or Pennsylvania regions.

The first question of the survey asked respondents what position they held and the second question asked how long they have been in their current role. Seventy percent of respondents categorized their position as the Administrator of a senior facility, and 53% of respondents have held their current position for five or more years.

Table 3.3. Q1. How would you categorize your current position?

Title	Count
Facility Manager	7
Facility Owner	0
Administrator	73
Director of Operations	6
Vice President of Operations	2
Other (i.e. CEO, COO, Dir. of Nursing)	16
Total	104

Table 3.4. Q2. How long have you been in your current position?

Length in Position	Count
Less than 6 months	6
6 months to 1 year	12
2 years to 4 years	31
5 years to 9 years	26
10 years or more	29
Total	104

Understanding a facility's ownership is a critical component to getting to the answer of one of the secondary questions being explored through this research, specifically how the size of

a facility and its association (i.e. for profit versus non-profit) affect its ability to prepare and respond to disaster events more effectively. Respondents were asked to identify the ownership for the facility they were representing. Question three below outlines the responses received. A fairly even split was recorded for Non-Profit (42%) and For-Profit (48%) facilities. Facility ownership was collapsed into For-profit, Non-Profit, and Government ownership types. These categories were moved forward as the dependent variable for the rest of the survey analysis.

Table 3.5. Q3. How would you describe the ownership type of your facility?

Facility Ownership	Total
State Government	3
County Government	2
Public/Private Partnership	3
Non-Profit	44
For Profit	50
Missing	2
Total	104

Cross tabulations were run for several scenarios using IBM's SPSS software for statistical analysis. The cross tabulations "produce contingency tables: frequencies for one variable for each value of another variable separately" (IBM 2016). Cross tabulations were first run on each variable that fell within the emergency plan category, preparedness and training category, and access to resources category, along with ownership type as the dependent variable. The same process was also used for the emergency services category. This process produced frequency tables that showed where the majority of the survey respondents fell with respect to having responded positively to having certain elements present in their emergency plans, or access to resources. Appendix B contains a complete copy of the cross tabulation tables resulting from the survey responses, specifically showing the series of scenario runs including those that examined whether there were marked differences between senior facility ownership type (i.e. For-profit versus Non-Profit). Several independent variables were examined against facility type to see if

any statistically significant connections existed. The independent variables were examined by combining variables into two primary factors: 1) elements of the Emergency Plan and 2) reliance on Emergency Services (i.e. resources). The following syntax was used within SPSS to complete the process of the variables being collapsed:

For the emergency plan variables:

“compute emerplan3=e1+e2+e3+e4+e5+e6+e7+e8+e9.” and for reliance on emergency services: “compute services3=s1+s2+s3+s4+s5+s6+s7.”

Facility ownership was also collapsed into three categories with the two government categories (i.e. state and county) and private/public partnership category combined into one overarching government category. The government category represented eight facilities. Cross tabulations were completed on each of the two factor categories that were developed from questions asked in the survey relating to elements of a facility’s emergency plan (e.g. what was included, how often it was updated) and access to resources (e.g. transportation, medicines). The cross tabs were used to identify where facilities fell on the spectrum of elements per their responses to the survey questions. Those categories with the highest values were then recomputed to create the final factor categories.

Table 3.6. Element Categories moved forward to Develop EP Factor Category

Facility Ownership	Emergency Plan Elements (Number of elements from survey)							Total
	1	3	5	6	7	8	9	
For-Profit	0	0	1	1	0	4	3	9
Non-Profit	1	1	0	0	6	24	12	44
Government	1	0	1	2	7	24	11	46
Total	2	1	2	3	13	52	26	99

Table 3.7. Element Categories moved forward to develop ES Factor Category

Facility Ownership	Emergency Services (Number of resources from survey)						Total
	1	2	4	5	6	7	
For-Profit	0	0	1	1	4	3	9
Non-Profit	1	1	0	4	26	12	44
Government	1	0	2	2	28	13	46
Total	2	1	3	7	58	28	99

One-way ANOVA tests⁶ were used to understand the variance between the dependent variable, facility ownership, and the independent variables that were combined together to create their respective individual factor categories (i.e. Emergency Plan and Emergency Services). Table 3.8 identifies cell sizes, group means, and standard deviations for each category that comprised the two factor categories used for the one-way ANOVA tests.

Table 3.8. Total Cell Sizes, Means, and Standard Deviation for the two factors by Ownership Type⁷

Ownership Type	EP (7)	EP (8)	EP (9)	Avg.	Standard Deviation	ES (5)	ES (6)	ES (7)	Avg.	Standard Deviation
For-Profit	7	24	11	14	8.9	10	20	14	14.7	5.0
Non-Profit	6	24	12	14	9.2	7	21	14	14.0	7.0
Government	0	4	3	2.3	2.1	1	2	4	2.3	1.5

For the elements of the emergency plan as compared with types of facility ownership, there were no statistically significant differences between group means as determined by one-way ANOVA ($F(6,92) = 1.092, p = .411$). Similar results were found for access and use of emergency services, where the one-way ANOVA showed again that there were no statistically significant differences between group means ($F(5,93) = .732, p = .601$). These results suggest that senior facility ownership type does not have an effect on a facility's overall emergency preparedness. This finding is important for this research because facility ownership was understood to be a potential driving factor for whether a facility had the resources to be better prepared to respond to environmental hazard events. Interviews with emergency management professionals indicated that for-profit facilities dominate the majority of senior facilities across New Jersey and that they are largely motivated by making money including limiting any disruptions to resident's services.

⁶ One-way ANOVA testing "produces a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. Analysis of variance is used to test the hypothesis that several means are equal" (IBM 2016).

⁷ Full output from SPSS analysis runs are available in Appendix B.

Eiring et al. (2012) conducted a similar research study in 2010 with nursing home administrators in Georgia, Florida, and California. The authors put out a questionnaire that contained 27 questions and was disseminated by web and mail to 498 administrators, of which 296 responded. The authors used a probit regression model to test the relationships between nursing home characteristics and measures of overall preparedness. The analysis did not identify any significant relationships between nursing home attributes and preparedness.

Spatial Analysis

Fragility of residents found within senior facilities can increase vulnerability and consequences from storm events (Greenberg 2014c) and as described in the literature (Chapter 2) portion of this study. The integration of geographic information systems (GIS) has allowed for increased analysis on vulnerable areas (Uitto 1998). These tools and subsequent spatial analyses have contributed a great deal to the process of hazards mapping, which creates visualizations that show critical information about a population's location and their proximity to hazardous areas. In addition to providing a mechanism to plan for future events, geospatial technology also allows for historic trends to be depicted by visualizing past events over a defined period of time. Researcher's accessibility to more robust and comprehensive data, at all geographic scales, has aided practitioners in identifying key assets, such as built infrastructure as well as the physical and demographic characteristics unique to a location, to examine how a community will react and respond should an event occur (Mileti 1999).

A common example of historic trend analysis and mapping is with hurricanes and other tropical cyclones. A typical indication of how resilient a community or region will be to a particular event can be estimated based on their previous exposures and how well they have responded to previous events. Historical analysis provides lessons learned, and can identify

limitations and deficiencies that can be used for planning purposes both in research as well as in practice.

The juxtaposition of mapping hazards spatial extents and the distribution of vulnerable populations is what Mitchell et al. (2008) describes as developing the vulnerability of place. Susan Cutter (1996) similarly defines the identification of vulnerability as “hazard of place” (page. 533). In this hazard of place, vulnerability is described as being guided by location and created based on the proximity to the source of the hazard (Cutter 1996). Vulnerability assessments conducted through spatial analysis provide a unique platform to combine social, economic, and natural vulnerabilities in a way that can help to identify current and future impacts as well as highlight past impacts to a location (Bai et al. 2014)

While this study does not involve a full place-based vulnerability analysis, the components developed as part of this project could be used to inform a vulnerability analysis as part of future research. This study, instead, explored vulnerability through “variables related to exposure” including “proximity to the source of threat, incident frequency and probability, magnitude, duration or spatial impact” (Cutter 1996, 533). Data examined for this study included hazards identified as part of the concept map (Figure 1.2, Chapter 1). Hazard specific data examined as part of the analysis are outlined in Table 3.9 below.

Table 3.9. Hazard Indicator Source Data

Data Set	Source	Data Category
SFHA/Q3	FEMA	Natural Hazard -Flood
Sea Level Rise (1-3 feet)	NOAA	Natural Hazard – Future Flood
Storm Surge (Irene and Sandy)	FEMA MOTF	Natural Hazard – Future Flood
SLOSH Storm Surge (Cat 1 - 3)	NOAA	Natural Hazard – Future Flood
NFIP Payouts (including Tropical Storms)	FEMA	Natural Hazard – Historic Events
Shallow Coastal Flooding	NOAA	Natural Hazard - Flood

Wildfires	NJDEP - NJFFS	Natural Hazard - Fire
Blizzards/Snowstorms	FEMA/SHELDUS	Natural Hazard - Snow

FEMA Flood Zones (i.e. 100 and 500 year floodplain)

FEMA's Special Flood Hazard Areas (SFHA) (i.e. A & V zones as well as 0.2%) and older Q3 data (i.e. data developed from 1996 to 2000 that was the precursor to the SFHA data) were included to identify senior facilities that were located in areas covered by floodplain management regulations. Facilities located in these areas would be required by the U.S. Federal Government to hold flood insurance. The Q3 data was downloaded from FEMA's Map Service Center and is included to capture all areas not included in the latest release of the preliminary flood insurance rate maps (PFIRMs) for the State but still capturing those other counties (inland and coastal) that may be subject to flood hazards as identified through FEMA's modeling. A definition query was used for the FEMA Q3 data to capture both the 100 year and 500 year flood zone areas:

FLD_ZONE = 'A' OR FLD_ZONE = 'AE' OR FLD_ZONE = 'AH' OR FLD_ZONE = 'AO' OR FLD_ZONE = 'X' AND ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD'

Sea Level Rise (1-3 feet)

Rising seas are an important consideration for many New Jersey municipalities especially when combined with issues of land subsidence. This analysis includes sea level rise data of one to three feet to cover the "likely range" for the 2050 time horizon as outlined in the Rutgers Science and Technology Advisory Panel (STAP) Summary report dated October 2016. The National Oceanic and Atmospheric Administration's (NOAA) sea level rise data for one to three feet were downloaded to be used as part of this study. Sea level rise data show inundation above Mean High High Water (MHHW) for the area they represent. Data disclaimer provided in the metadata by NOAA: "The dataset should be used only as a screening-level tool for management decisions.

As with all remotely sensed data, all features should be verified with a site visit. The dataset is provided as is without warranty to its performance, merchantable state, or fitness for any particular purpose.”

Historic Storm Surge (Hurricane Irene and Superstorm Sandy)

Historic storm surge data provide a historic reference for coastal and inland areas impacted from previous storm events. The storm surge data were created by FEMA from field-verified High Water Marks (HWMs) and storm surge sensor data from the United States Geological Survey (USGS). The process used to develop the data included taking the HWMs and surge sensor data to interpolate a water surface elevation. The data resulting from the interpolation was then subtracted from the best available digital elevation model (DEM) to create both a depth grid and surge boundary for each State impacted (FEMA MOTF website).

FEMA National Flood Insurance Payouts (NFIP)

Loss statistics provided by the FEMA Policy & Claim Statistics for Flood Insurance website accessed at <https://www.fema.gov/policy-claim-statistics-flood-insurance>. The information captures loss statistics from January 1, 1978 through to December 31, 2017. The information was gathered for all municipalities in New Jersey and then joined to municipal boundary data. Data disclaimer provided by FEMA: “FEMA and the Federal Government cannot vouch for the data or analyses derived from these data after the data have been retrieved from the Agency's website(s) and/or Data.gov.”

NOAA Shallow Coastal Flooding

Shallow coastal flooding, often called “nuisance flooding” was included to determine what, if any, facilities may be impacted by regular high tide cycles in coastal and along inland tidal water bodies. These data could help to show municipalities that may encounter regular road

closures due to this type of flooding. Data disclaimer provided in the metadata by NOAA: “The dataset should be used only as a screening-level tool for management decisions. As with all remotely sensed data, all features should be verified with a site visit. The dataset is provided as is without warranty to its performance, merchantable state, or fitness for any particular purpose.”

Wildfires

Data on wildfires were included because of the high impact these events can have on egress and access points in and around the locations of senior facilities. Wildfires are more common in the southern part of NJ but can be present across the State. Figure C.2 in Appendix C, shows areas with high, very high, and extreme potential of wildfires based on the New Jersey Department of Environmental Protection’s land use classification system based on a combination of the 2002 land use land cover data and 10-meter digital elevation updated through May 2009. Historic wildfire data were also examined to understand where major fires have taken place in the State. The data were provided by the NJ Forest Fire Service (NJFFS), Department of Environmental Protection. These data represent major wildfire events (i.e. 100 acres or more) from 1924 through to February 27, 2018. Data disclaimer provided by the NJFFS: “the data records may not be complete and coverages are best estimates of fire boundaries.”

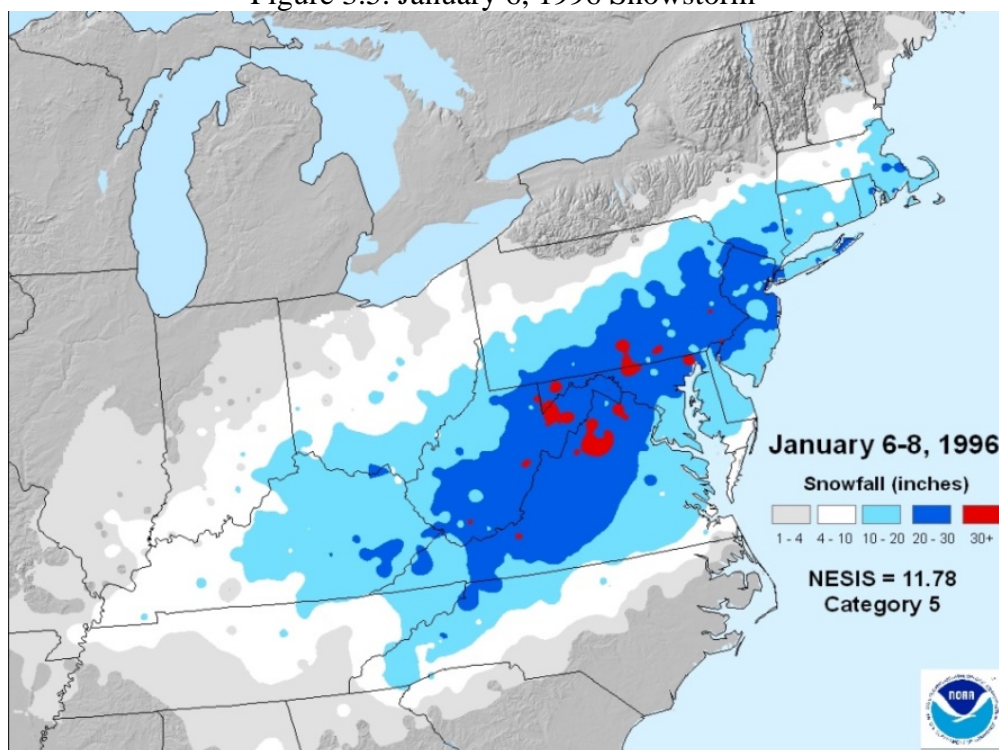
NOAA SLOSH Category 1 through 3 Storm Surge

NOAA’s Sea, Lake, and Overland Surges from Hurricanes (SLOSH) data were derived from storm surge inundation maps. According to NOAA, “these maps represent maximum of maximum (MOM) outputs from Sea, Lake, and Overland Surges from Hurricanes modeling of hurricane scenarios for hurricane evacuation studies.” Data sources include information from FEMA, the United States Army Corps of Engineers, and NOAA. Data disclaimer indicates that these data “do not account for sea level rise.”

Blizzards/Snowstorms

Blizzards and large snow storms can cause havoc over larger areas in a short period of time. They can cause widespread power outages, downed trees and leave areas without transportation access to resources and, in the case of senior facilities, without access to needed staff and medications. Power outages can extend for days until trees are cleared from roadways and weather conditions improve enough to allow utility crews access to areas needed to restore power. Figure 3.5 below provides an example of the widespread impact snowstorms can have on the region and shows the nor'easter that impacted the region on January 6, 1996.

A combination of data were used to examine this category including the FEMA disaster declarations as well as data from the Special Hazard Events and Losses Database for the United States (SHELDUS). Both datasets provided county-level historic hazard data. The SHELDUS database is hosted out of the University of South Carolina and managed by the University of Arizona. Data were purchased and downloaded for all 21 counties in New Jersey for every natural hazard type available. The database provides information such as event type, year, county, property damage estimates, crop damage estimates, injury estimates, and fatality estimates per event. Storm events for winter weather were queried and were aggregated per county for the time period available from 1960 through to 2016 (see Figure C.14. in Appendix C). The FEMA disaster declarations data provide summary level data for all federally declared disasters listing all counties included in the declarations. These data provided a level of validation to the SHELDUS data for large snowstorm events but were not individually mapped.

Figure 3.5. January 6, 1996 Snowstorm⁸

An unweighted⁹ linear model, similar to the DRASTIC model - a groundwater pollution hazard assessment model described by James W. Merchant (1994), was used to complete the hazard assessment:

$$\text{AllHazTot} = \text{Q3} + \text{PFIRM} + \text{IreneSurge} + \text{SandySurge} + \text{ShallowCoa} + \text{SLR1} + \text{SLR2} + \text{SLR3} + \text{WildfirFue} + \text{HisFire} + \text{CAT1} + \text{CAT2} + \text{CAT3}$$

Where:

AllHazTot = Total Hazards examined located within a NJ municipality

Q3 = 100 year and 500 year floodplain (inland areas)

PFIRM = 100 year and 500 year floodplain (coastal and inland areas)

IreneSurge = Hurricane Irene storm surge

SandySurge = Superstorm Sandy storm surge

ShallowCoa = Shallow coastal flooding areas

SLR1 = 1 foot sea level rise

SLR2 = 2 feet sea level rise

SLR3 = 3 feet sea level rise

WildfirFue = Wildfire Fuel areas

HisFire = Major Wildfires (over 100 acres)

CAT1 = SLOSH Category 1 storm surge

⁸ Map figure taken from NOAA NCDC website: <https://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

⁹ See Limitations section for caveat about the unweighted linear model used for the hazard assessment.

CAT2 = SLOSH Category 2 storm surge

CAT3 = SLOSH Category 3 storm surge

Table 3.10. Results of individual hazard model runs

Hazard Layer	Senior Facilities Potentially Impacted	Map Figure	Page Number
NFIP (all payouts)	288	Figure C1	190
Wildfire Fuel Hazard (High to Extreme)	49	Figure C2	191
Major Wildfires	27	Figure C3	192
Superstorm Sandy Surge	14	Figure C4	193
Hurricane Irene Surge	4	Figure C5	194
FEMA Flood A, V, and 0.2% Zones	41	Figure C6	195
Shallow Coastal Flooding	2	Figure C7	196
Sea Level Rise – 1ft	0	Figure C8	197
Sea Level Rise – 2ft	0	Figure C9	198
Sea Level Rise – 3ft	2	Figure C10	199
SLOSH Category 1	13	Figure C11	200
SLOSH Category 2	25	Figure C12	201
SLOSH Category 3	38	Figure C13	202
Blizzard/Snowstorms	-	Figure C14	203

The model run resulted in a database that could be used to examine individual hazards for each senior facility within each municipality in New Jersey, but also through various combinations of interest. Null values were removed and replaced with zero values to create a (1/0) binary of presence/absence within individual senior facilities. The individual facility data were then aggregated to the municipal level and frequencies of hazards were created.

The compilation of maps developed through the hazard assessment highlight specific impacts to senior facilities from historic and projected future flood events as well as from past and potential events from wildfires. As described earlier in this chapter, the Pinelands cover a large portion of the south central part of the State. This area showed to also have the highest potential of future wildfires as depicted in Figure C.2. Forty-nine facilities are currently located in areas that have seen wildfires in the past and are dominantly located in the Central East Region of the State (see Figure C.3). While most of the past and projected flood hazards highlight senior facilities located in the coastal areas of the State, the FEMA floodplain maps

show that inland senior facilities may also be impacted by flooding events including those from tropical induced storms. Figure C.6 highlights how flooding in riparian areas as well as coastal areas can potentially impact senior facilities. To see a copy of the complete set of maps developed from the hazard assessment, please refer to Appendix C.

The municipal level data were moved forward for this research so as to not call out any one specific senior facility. These frequencies can be divided by senior facility count within each municipality to get the average number of hazards that could be encountered from the list of hazards examined (as shown in Figure 3.6). This information helps to inform the question being examined as part of this research as to whether senior facilities are located within already overburdened municipalities. Composite categories were also created to examine specific combinations of hazards such as flood hazards, or wildfire hazards.

Figure 3.6. Average Hazard Events per Senior Facilities within Municipalities

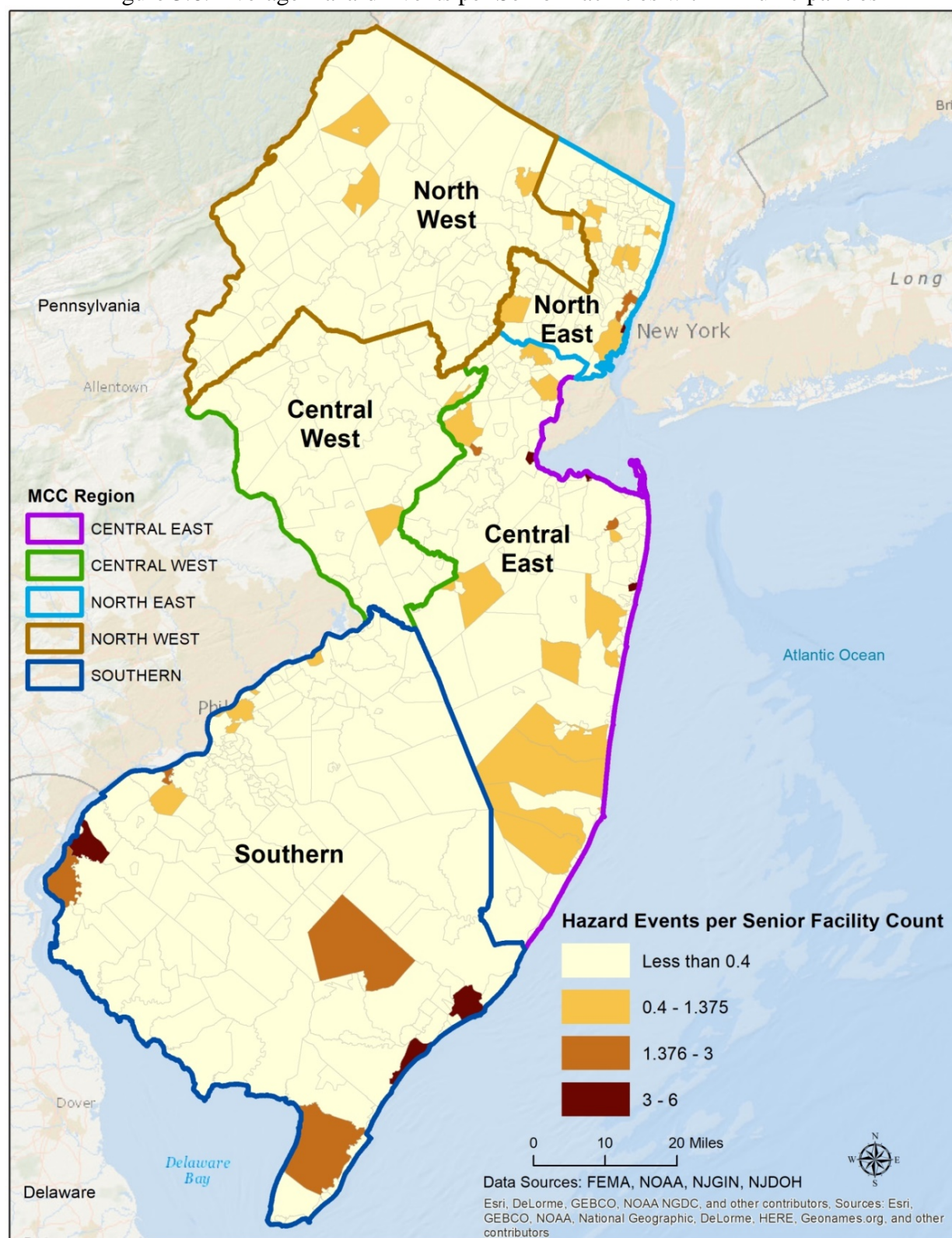


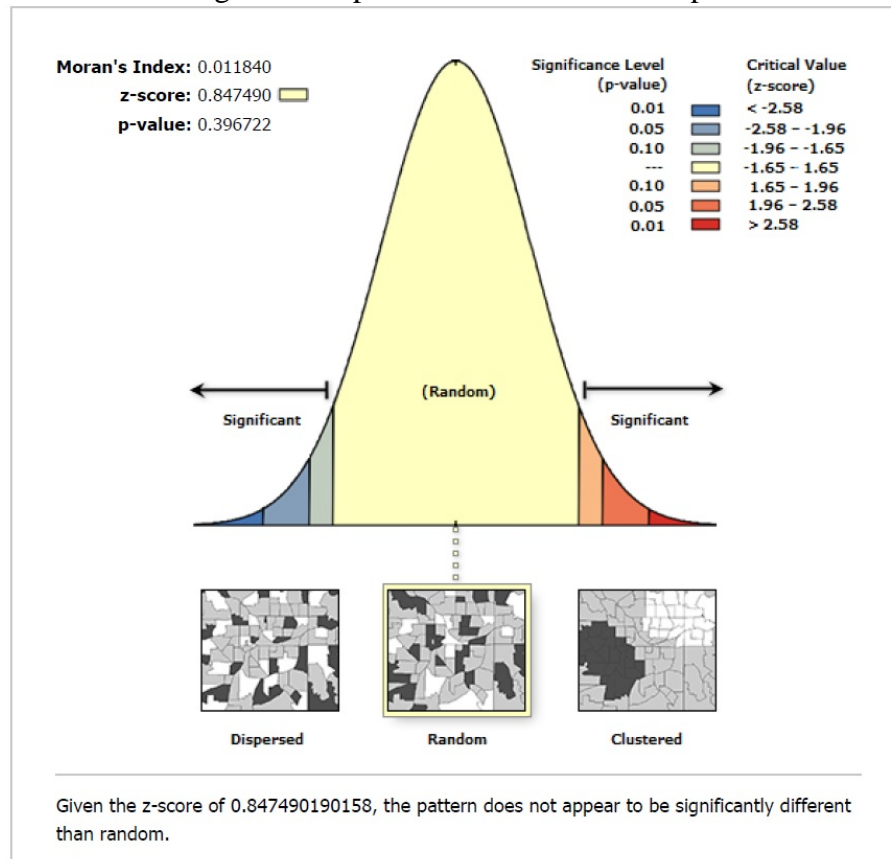
Table 3.11 below outlines how many municipalities fell into each of the average categories based on their associated MCC Region. While the majority of the State fell in the less than 0.4 category, the table does highlight municipalities that are known to have significant impacts from natural hazards such as coastal storms, and even regular tidal flooding (e.g. Atlantic City and Ocean City). The Central East MCC Region contained the highest number of total municipalities impacted by hazard events, but the Southern MCC Region had individual municipalities with a larger number of average hazard events. Senior facilities located in the North East, Central East, and Southern MCC Regions have a higher proportion of hazard event potential than the Central West and North West MCC Regions.

Table 3.11. Municipalities with Average Number of Hazards

MCC Region	Less than 0.4	0.4 to 1.375	1.376 to 3	3 to 6	Total > 0.4
Central East	115	12	2	3	17
Central West	57	2	0	0	2
North East	94	7	2	1	10
North West	97	4	0	0	4
Southern	158	4	4	3	11
Total	521	29	8	7	-

Spatial Autocorrelation (Global Moran's I) was used to examine the overall pattern of the AllHaz output variable. The tool run included using the inverse-distance, Euclidean distance method. The output of the spatial autocorrelation run (Figure 3.7 below) showed that the AllHaz output contained a z-score of 0.848 with a p-value of 0.397 indicating that the variable is randomly distributed across New Jersey municipalities.

Figure 3.7. Spatial Autocorrelation Output



Summary and Conclusions

Chapter 3 described two different quantitative methods that were used as tools to understand senior facility preparedness and how frequency of natural hazard events may impact facilities based entirely on where they are located in the State. The first method used was a survey of facility administrators to examine whether characteristics of facilities could be correlated with overall level of preparedness. Five hundred and ninety-five mail-push-to-web mailings were sent out to senior facilities across New Jersey. One hundred and four people accessed the survey online, with 99 respondents completing most or all of the questions asked. The survey responses were examined using SPSS software and no significant results were found linking facility type (i.e. non-profit versus for-profit) to a higher level of preparedness. Specifically with one-way ANOVA results showing ($F(6,92) = 1.092, p = .411$) when elements

of the emergency plan was compared with types of facility ownership. Similar results were found for access and use of emergency services, where the one-way ANOVA showed again that there were no statistically significant differences between group means ($F(5,93) = .732, p = .601$). The method employed was similar to the analysis completed by Eiring et al. (2012) with nursing home administrators in Georgia, Florida, and California. The authors put out a questionnaire that contained 27 questions and was disseminated by web and mail to 498 administrators, of which 296 responded. Findings from their statistical analysis did not identify any significant relationship between nursing home characteristics and measures of overall preparedness. Future research could examine whether an indicator exists outside of facility ownership that may help to predict the overall level of senior facility preparedness (e.g. corporate holdings, funding sources, etc.).

Survey responses were confidential and provided by facility administrators that chose to participate in the research study. Responses may therefore be subject to self-selection bias and may not necessarily be generalizable to all senior facilities in New Jersey (Lavrakas 2008). One complication from the method used for survey distribution was the anonymous link generated by the web-based software - https://rutgers.qualtrics.com/SE/?SID=SV_7NU6AjHZDK3Ywdf. This link contained an underscore that was hard to decipher on hard copy mailings because of the automatic underline of the hyperlink. This may have impacted the overall response rate for the survey because of administrators not seeing the correct website address to respond to the survey and should be something corrected for future studies.

The spatial analysis used a series of past, present, and future (i.e. projected) hazard conditions as a measure of frequency of events per New Jersey municipality that could impact an emergency response system senior facilities may be relying on for emergency events. Results

showed that senior facilities across the State had the highest potential for impacts from past and future flooding events as well as from wildfires (again, both potential and historic). These results suggest that senior facilities should focus on these hazards as part of their emergency plans if they are not currently doing so. Many senior facilities (i.e. 93 out of 99 respondents) indicated through the survey conducted as part of this research that their emergency plans addressed flood hazards (see Table B.3). The number dropped drastically (i.e. 30 out of 99 respondents) when facilities were asked if their emergency plans included wildfires/forest fires (see Table B.5). The spatial analysis (i.e. Figures C2 and C3) showed that facilities located within the Southern and Central East MCC Regions should pay particular attention to this potential hazard because of historic impact from and future potential of its occurrence and should include the hazard as part of their emergency planning efforts.

Data were aggregated to the municipal level to examine patterns of frequency distribution over the State and to highlight areas that may have emergency services burdened by higher potential risks to broader populations from natural hazard events, before accounting for the additional possible burden that senior facility residents may put on specific locations under emergency event scenarios. Municipalities in the Central East (i.e. 17), North East (i.e. 10), and Southern (i.e. 11) MCC Regions were shown to be impacted by a higher proportion of natural hazard events than the Central West and North West Regions. That is not to say that all senior facilities should not be prepared for natural environmental hazard events, but it does highlight areas where emergency resources may be scarce under even smaller scale scenarios because of broader impacts to municipalities over the course of a year. While the spatial analysis did not complete a full vulnerability analysis, it did highlight areas of the State (i.e. Central East, North East, and Southern MCC Regions) where resources could be focused on to ensure areas with

higher risks are in compliance with their preparedness plans and procedures including having contracted resources with multiple contractors.

Chapter 4: Qualitative Analysis – A View from the Field

Overview

Semi-structured interviews were used to identify past experiences and present day planning efforts at senior facilities and with emergency managers across New Jersey. Responses from interviews were examined to identify what gaps are present in current preparedness and planning practices as well as whether there were any major identifiable differences between protocols in place at senior facilities based on their size and/or their association. Interview participants were solicited for their feedback and were informed they would not be compensated for their participation. Participants were also provided a copy of both an interview guide as well as the Internal Review Board (IRB) consent form that outlined their rights and privileges as a participant (see Appendix A). Interviews were conducted from May 2017 through September 2017 with a final interview completed in December 2017 in order to capture one final county emergency coordinator's perspective.

To the extent possible, a snowball approach was used to identify and contact possible participants starting with contacts at the New Jersey State Office of Emergency Management (NJOEM), and speaking with regional coordinators who then introduced me to county emergency managers. The snowball method was a useful approach to get in contact with persons of authority who may not have been as open to cold call requests (Atkinson & Flint 2001). Nineteen emergency managers were contacted, with 13 participating in the in-person interviews. Four participants were emergency managers representing the State, with nine representing county offices of emergency management.

The quantitative method of this research study involved a census survey of senior care facilities in New Jersey (outlined in Chapter 3). As part of that questionnaire, respondents were

asked if they would be willing to be contacted with additional questions. If the respondents answered “yes”, they were asked to provide an email address. Fifty-eight people out of the 99 respondents indicated they would be willing to answer follow up questions related to this research and provided email addresses. Email addresses were used to provide participants with additional background into the research study and to ask for willingness to participate in the interviews. Participants held positions as administrators, executive directors, and directors of operation and nursing of senior care facilities representing both non-profit and for-profit facilities. For the purposes of this chapter, all senior care facility representatives will be called “administrators”.

Two interview guides were used, one for emergency managers and the other for facility administrators. The interview guide for emergency managers had 23 questions, with themes related to response, planning, and training to capture the different elements of emergency managers’ participation in senior facility hazard planning. The interview guide for senior facility administrators contained 31 questions. Each interview took approximately one hour to complete, with some interviews taking less time. Full interview guides are provided in the appendices section (see Appendix A) as well as the questions being outlined below.

The rest of the chapter is broken into three sections. The first section outlines the breakdown of participants based on the organizations they represent. The second section outlines responses received from emergency managers including stand-out themes identified from the use of qualitative data software analysis. The third section outlines responses received from facility administrators, again including prominent themes identified through the use of qualitative data software analysis. Content provided as part of this document sometimes has been paraphrased to

maintain confidentiality. Representations made are my interpretation of what was heard in the interviews and should not be directly associated with any one individual or organization.

Breakdown of Participants

The emergency managers who participated in the interviews had been an Emergency Manager Coordinator or Deputy Coordinator for an average of 12 years with one to two years on the low end and 30 years on the high end. The facility representatives that participated in the interviews had been in their positions within senior facilities on average for eight and a half years with a range of less than one year to 30 plus years. Positions held by interviewees included: Administrators, Executive Directors, President/CEO, Director of Nursing, and Director of Operations.

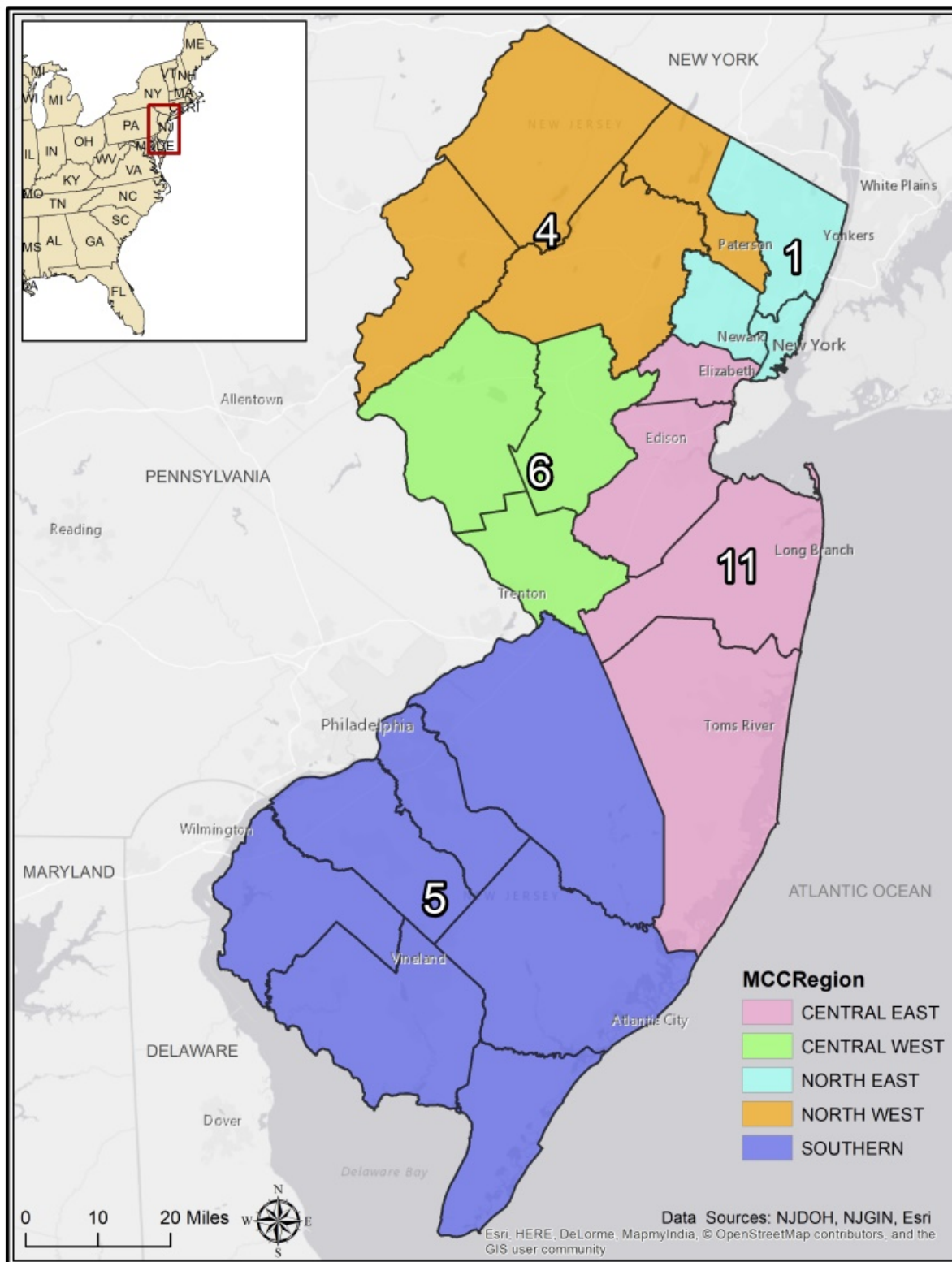
A common comment made by emergency managers was that there is a high turnover among senior facility administrators. What I observed, are that staff are more likely to move between positions or facilities (if the senior facility is connected to a network of facilities) as a way to gain promotions or other types of upward movement. From the outside it may appear as though a facility has a high level of administrator turnover, but in fact the institutional knowledge may be maintained just from a different position within the institution. This is particularly important for emergency preparedness at senior care facilities where the administrator is the lead on how involved a facility is in preparation of a natural hazard event. They oversee staff training and preparation and are the responsible authority (along with supportive staff) on contracts with outside vendors. If an administrator is laissez faire about emergency preparedness at a facility, the staff may take on a similar epistemology of preparedness, procedures and protocols not being as important as other priorities such as resident care.

Senior facility participants were relatively evenly split between for-profit institutions and non-profit institutions (Table 4.1). This was not done intentionally, and again participants were selected based on their willingness to be interviewed. Facilities were also dominantly located in the suburbs with only one facility located in a rural area (see Table 3.2 in Chapter 3 for facility location as a measure of population per capita). Out of the 77 people contacted, 31 participated in this study. The majority of interview participants were located in the central part of the State, with six participants located in the central west region and eleven participants from the central east region, respectively (Figure 4.1).

Table 4.1. Interview Participants

Entity	Count
State	
NJ Office of Emergency Management (NJOEM)	2
NJ Department of Health (NJDOH)	2
County Emergency Managers (out of 21)	9
Total State Interviews	13
Senior Facilities	
For-profit	9
Non-profit	8
County LTC Workshop	1
Total Facility Interviews	18
Total Interviews	31

Figure 4.1. Geographic locations of semi-structured interviews based on MCC Regions



Emergency Management Interviews

The field of emergency management is typically focused around four major themes: response, recovery, mitigation, and preparedness (Cutter 2003, Schwab & Sandler 2016). These themes framed how the interview guide was discussed with the senior facilities and emergency managers.

Table 4.2. Interview questions posed to emergency management participants

Number	Prompt
1.	<i>What are OEM's concerns with senior facilities during disaster?</i>
2.	<i>Facilities are required to have hazard plans in place, but we have been told by facilities that some of them still rely on emergency services in the time of an emergency such as a natural disaster. What would you like to see improved with senior facilities in terms of resources prior to and directly after a disaster event?</i>
3.	<i>Were any incidents or requests raised to County OEM by municipalities or facilities during Hurricane Irene? Superstorm Sandy? Or any other disaster that you are aware of?</i>
4.	<i>Were any requests made through Hippocrates10?</i>
5.	<i>How are the lessons learned from these major storms being used to improve coordination at the State?</i>

The first question within the response section of the interview guide asked emergency managers to provide guidance on what would be a top concern with senior facilities during a disaster event. The question aimed to see if there were commonalities between the county and state emergency managers. Seven out of the 13 interviews indicated that resources (contracted or on-site) were a top concern when working with senior facilities during an emergency event. Resources include things such as transportation for movement of residents, generators and needed fuel for the generators, facility personnel, food and medications. Identified concerns ranged from availability of contracted services, on-site generators to support resident needs, to availability of transportation resources in case of evacuation. Specifically, emergency managers identified the need for transportation contracts as a concern within New Jersey. This concern is reinforced

¹⁰ Hippocrates is a New Jersey Department of Health software system used to receive and provide information about health facilities including senior facilities in emergency events.

through findings by Peek (2010) and Howard (2012) who identified that specialized equipment to transport seniors with physical disabilities may not always be available, and onsite staff may not be enough to assist with the number of residents during an evacuation.

One emergency management professional clearly indicated how resources were a concern at the State:

Resources are spread thin during a disaster and people in those facilities are going to need more resources than just being able to tell them to “hey, go drive away”, so usually they need a lot more assistance for evacuations. – Emergency Manager at the NJOEM

Mobility and health of residents were other concerns as were having emergency plans that had been exercised. One emergency manager indicated that having an “executable plan” was a top priority.

The additional four questions within the response theme, received similar feedback. In place of resources was an integral component to facilities not being reliant on emergency responders during an emergency event. Self-reliance was a preferred way identified by emergency managers that senior facilities could improve their overall emergency preparedness. Self-reliance was demonstrated by emergency managers through facilities having contracts in place with other senior facilities (in-network or out-of-network), as well as up-to-date contacts and signed agreements with transportation providers in the event residents would need to be evacuated to another location. One emergency manager indicated that even if a facility has an alternative location identified that under emergency circumstances it may no longer be available:

I know of [at least] one facility during [Hurricane] Irene that had a contract with a hotel but before the storm the federal government came in and took the rooms for their needs.

Luckily down the street there was another hotel that could be used for long-term care residents but food had to be brought in because the rooms did not have kitchens like in the other hotel.

Another emergency manager indicated the following:

Facilities overall really need to know what they have access to in terms of resources.

Limited options in parts of the State make it important for facilities to be aware of that and plan for it.

The last question asked how past events have improved present day coordination. One emergency manager indicated they have completed the following to increase coordination within their county:

We created an email distribution group for the LTC's [Long Term Care]. We use this to push out relevant information. We conduct a yearly planning and information session for the [senior facility] administrators and make a conscious effort to attend each of their drills.

– County Emergency Manager

Other emergency managers indicated they had seen “improvement in coordination with state entities and between facilities” and that “self-reliance during emergency events” should continue to be a top priority. Most emergency managers and administrators indicated coordination has improved, thanks in part to new legislation mandating some level of interaction (State 2011), however there continues to be room for improvement. Some administrators and emergency managers are content on interaction as needed or on a yearly basis, others are striving to coordinate through continuous trainings, information sessions, etc.

Table 4.3. Interview questions posed to emergency management participants related to planning

Number	Prompt
1.	<i>Are you aware of any regional planning among counties or senior facilities to address senior facilities during a disaster?</i>
2.	<i>With what regularity are you or other members from your staff invited to participate in senior facility disaster exercises? Do you keep track of how many invitations you receive in a given year?</i>
3.	<i>Can you describe to me how senior facilities submit their emergency plans to the County for approval?</i>
4.	<i>Will OEM hold onto a copy of the plan or is it returned to the facility?</i>
5.	<i>What is the process if a facility does not submit their plan for yearly review? Is there any direct follow up from the County or Municipal OEM?</i>
6.	<i>Is OEM depending upon senior facilities to be responsible for their own shelter during a disaster? Do the municipalities or the county have contingency plans if a facility is unable to shelter their own residents?</i>
7.	<i>What if a county is planning to use area senior facilities as public medical needs shelters? How would this coordination be documented since it involves several groups?</i>
8.	<i>What coordination exists, if any, at the county level to ensure senior facilities are not reliant on emergency services during the time of a disaster (i.e. for evacuations, for supplies and other resources)?</i>
9.	<i>On September 8, 2016 the Federal Register posted the final rule Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers. The regulation went into effect on November 16, 2016. Health care providers and suppliers affected by this rule must comply and implement all regulations one year after the effective date, on November 16, 2017. Are you aware of this new CMS rule?</i>

The second theme focused largely around ongoing planning efforts including access to resources for planning, receiving emergency plans from senior facilities and mechanisms to provide feedback, as well as increased obligations identified under new regulatory guidelines that had recently been implemented.

The first question asked emergency managers if they were aware of regional training that was offered to assist senior facilities prepare for emergency events. The majority of managers (or eight out of the 13) were aware of, or had participated in, training that was offered in conjunction with the NJDOH, through the regional healthcare coalitions, or between the facilities themselves. County emergency managers from the northernmost counties were more likely to indicate they

were not aware of training. Interview participants indicated they would be interested in trainings on topics such as emergency plan development, planning and implementing emergency exercises, as well as general training on emergency management procedures including the Incident Command System (ICS), a FEMA approved organizational framework established under the National Incident Management System (NIMS). The Incident Command System (ICS) is a standardized approach to emergency management designed to allow for single or multiple agencies to integrate into a single or unified command system to address small to complex incidents. The organizational concept provides stakeholders the ability to establish common processes and procedures to address agreed upon objectives identified by incident command. This management framework was developed in the 1970s following a number of historical fires in California. This system was adopted as part of the NIMS and mandated through the Homeland Security Presidential Directive 5 to be used to coordinate incident management throughout various levels of government.¹¹

The next question asked emergency managers about their engagement with senior facility emergency exercises and also tried to understand who kept track of how many senior facilities participating in emergency exercises during a given year. One county emergency manager indicated that it was “very rare” they received invitations to participate in emergency exercises at senior facilities but that they did keep track of the invitations received. While it may seem as if facilities are not inviting emergency managers to their emergency exercises in this county, it is more than likely that the county has requested that local municipal emergency coordinators take the lead and responsibility to work with senior care facilities directly. With that exception, the rest of the facilities indicated receiving invitations regularly. All emergency managers indicated

¹¹ FEMA’s Incident Command System 100 level training with resources available: <https://training.fema.gov/emiweb/is/icsresource/trainingmaterials.htm>

they kept track of the invitations they received. Some were kept as part of a calendar system on their computers, others were held digitally with the facility's emergency plan, and others were stored as hard copy invitations along with their hard copy files.

One assumption I had before speaking with emergency managers was that the number of emergency exercises held by senior care facilities across the State would be tracked by year and that for planning purposes if questions ever arose about how many facilities were completing preparedness requirements for a given year, those numbers could be easily acquired. What I found from the interviews was that because no one has ever asked the question about how many facilities across the State have participated in emergency exercises in a given year, those numbers are not held by anyone at the State. That it is instead up to the municipality or county emergency coordinator on whether or not they have a record of that information. More specifically, when asked a follow up question about whether they would be able to provide historic counts of facilities' emergency exercises, only one county emergency manager strongly indicated they would be able to provide those numbers. Other emergency managers indicated they would have complete counts for the current year but would not be able to easily go back and provide counts.

The next three questions, prompts 3, 4, and 5 above in Table 4.3 asked participants about the protocol to submit an emergency plan to the counties, how that plan is stored, and whether emergency managers will follow up with facilities that are delinquent with submitting their plans.¹²

All emergency managers responded that if an emergency plan was submitted by a facility, a copy would be held, either digitally or in hard copy, at the county office of emergency

¹² Emergency plans are due to County and/or Municipal Offices of Emergency Management by senior facilities on a yearly basis per NJDOH regulation.

management. Some of the counties indicated that a copy of the plan may also be held at the municipal office of emergency management. The NJDOH crosswalk is a document that was developed by the Division of Public Health Infrastructure, Laboratories, and Emergency Preparedness (PHILEP) within the NJDOH. The document is a matrix that allows facility administrators (or whoever develops their emergency plan) to identify which sections in their overall emergency plan correspond to the State or Federal regulations on emergency preparedness. There are different versions of the crosswalk that have been developed based on the type of facility. Attached as Appendix D are the crosswalks for nursing homes, assisted facilities, and a document developed from Yale University that outlines changes based on the new CMS rule. This offers emergency managers reviewing the plan an opportunity to focus on the sections that are most pertinent to their review and cuts down on the time it takes to review facilities' plans on a yearly basis. Six out of the nine county emergency managers interviewed indicated they required submission of the NJDOH crosswalk along with a facility's emergency plan before it will be reviewed. One emergency manager indicated the following about the NJDOH crosswalk:

The crosswalk helps to serve as the guide to make sure a facility's plan is complete and addresses appropriate actions.

- County Emergency Manager

Whether or not a county (or municipality) followed up with senior facilities within their jurisdiction was split. Some indicated that they had "100% compliance with their facilities" while others said that it was "not their job".

When emergency managers were asked about whether they were depending on senior facilities to be responsible for their own shelter during an evacuation, seven out of the nine

county emergency managers indicated that yes, they were. The “yes” responses were quickly clarified by stating they have spoken to facilities regarding alternatives, or they have contingencies in place if they were needed. With statements similar to the following:

If they need to evacuate they [emergency management] will assist them in the process but they [emergency managers] would expect the facility to have a predefined location to move residents to.

- County Emergency Manager

Emergency managers were also asked what happens if a senior facility is being used by the county as a medical needs shelter¹³. The majority of the county emergency managers indicated that their designated medical needs shelters were separate from senior facilities. Three of the nine counties interviewed have used senior facilities as medical needs shelters under emergency events with one county emergency manager elaborating:

If the facility is a medical needs shelter there is a full list of regulatory needs and regulations for this and the process becomes different. This has to be decided and documented at the local level if this is the case. This would be done through developing a planning group to complete this process in a plan.

- County Emergency Manager

When asked about whether counties were coordinating with senior facilities to ensure facilities were not reliant on emergency services during the time of a disaster, five of the nine counties indicated it would be identified and brought up during the facilities’ emergency plan review, or that they hold a yearly information session for facilities where this topic (i.e. the importance of having multiple contracts with resources) would be stressed. One emergency

¹³ A medical needs shelter is a place identified during an emergency event to provide medical assistance to people who would not be able to go to a general public shelter due to their medical requirements.

manager responded that “this is the primary focus of why we are so engaged with these facilities” and another indicated that “we try to get them to have multiple contracts for services as part of their plans. I know of one facility (76-120 beds) that is relying on emergency services if their residents ever need to be evacuated.”

The final question in the Planning theme asked participants if they were aware of a recent regulation change that would impact preparedness for senior facilities and for emergency managers who are involved in senior facility preparedness. The specific question asked was “*On September 8, 2016 the Federal Register posted the final rule Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers. The regulation went into effect on November 16, 2016. Health care providers and suppliers affected by this rule must comply and implement all regulations one year after the effective date, on November 16, 2017. Are you aware of this new CMS rule?*”

Eight of the nine county emergency managers interviewed indicated they were aware of the new rule and were working with the NJDOH to get up to date on how the federal guidelines would be translated and required at the State level. “Yes and we reviewed and informed all local emergency management coordinators at numerous meetings”, said one emergency manager. However, one county emergency manager indicated they were not aware of the new rule. Among the changes that will happen to existing preparedness protocols, the federal rule will require facilities to increase their yearly emergency evacuation exercises from one to two for each facility, requiring potentially more time of emergency managers to attend additional exercises.

Under the set of questions specific to training, the first question asked if counties offered any State-based training specifically targeted for senior facilities. The second question asked specifically about emergency managers’ awareness of the new CMS rule requirements.

Table 4.4. Interview questions posed to emergency managers related to training

Number	Prompt
1.	<i>Has the County OEM offered any State-based training for senior facilities?</i>
2.	<i>Are you aware that under the CMS rule senior facilities are now required to hold two exercises on natural hazards per year?</i>

With respect to the question on training, four of the nine county emergency managers indicated they were aware of training offered either by their county or within the region that would include senior facilities. One manager said “Yes, all facility personnel are invited to all county sponsored training including NJOEM and NJOHSP programs offered in the county.”

Five out of the nine county emergency managers indicated they were aware of the new increased obligation for senior facilities to participate in one additional emergency exercise with the remaining county emergency managers either not responding to the question or responding as a “no”.

The final questions asked to county emergency managers were “how would you describe an effective facility plan? What would be the most critical aspects?” The responses varied, but were very helpful in describing what aspects of preparedness still needed to be addressed, or could use additional refinement. One emergency manager said:

When the crosswalk is in place, it provides a comprehensive plan for the facilities to follow. A comprehensive evacuation plan that describes both horizontal and vertical evacuation procedures if a senior facilities has more than one floor. Hold exercises off hours and on weekends so that it tests staff and residents outside of normal business hours and with all shifts. Provide details on resiliency strategies.

– Emergency Manager

Another said the critical aspects would be to make sure a “Reception site is established; transportation resources have been identified; procedures and plans are in place to move records, meds and other essential supplies; and Mutual Aid Agreements are clearly identified and roles are defined.” Others said “as with all plans until you exercise it and try it out with ALL agencies involved you won’t know it is effective. So my answer is to start and then try it out” and to have a “unified template so there is consistency between facility plans and resources. Also identify resident needs and requirements, catering to first responders as well as facility staff. Plans would benefit from more information and secondary contacts for equipment.” And finally one emergency manager said it was important to have “current contact information for all critical entities needed.”

Interviews with Senior Facilities

The interview guide for facilities that house seniors in contrast, was set up around risk management strategies as outlined in Chapter 2 of this document. The interview guide was broken into three themes: 1) Organization Management, 2) Planning and Support, and 3) Municipality (i.e. municipality support).

Table 4.5. Interview questions posed to facilities related to organization management

Number	Prompt
1.	<i>How many total staff members work at the facility?</i>
2.	<i>How many of those are full-time?</i>
3.	<i>How many are part time?</i>
4.	<i>Do you have employee roles that are considered essential personal?</i>
5.	<i>What positions do these employees usually hold?</i>
6.	<i>Are there protocols in place to contact employees during a time of emergency?</i>

The first set of interview questions tried to understand the size and scale of senior facilities. The responses received have been summarized in the table below (see Table 4.6). The average number of total employees for the facilities interviewed was 312 employees. Of the average total of 312 employees, 180 were full time employees and the rest were either part-time employees or

per diem.¹⁴ Facilities were split on what staff were considered essential personnel. A little more than half indicated that all of their director roles would be considered essential along with nursing staff, planning and operations personnel, as well as staff who help with food service. Just under half of the facilities indicated that all staff were considered essential personnel. Although staffing concerns during an emergency event have been highlighted in the literature (Qureshi 2001), present day facilities seem content they have the needed staffing resources for present day and future events.

When facilities were asked how they contact employees during a time of an emergency, overwhelmingly facilities responded by phone (this included multiple means of communications – both text and voice in some instances). Other facilities included electronic mail as part of their means to communicate with staff, and one facility had a system in place that would send automated electronic messages to all staff.

Table 4.6. Responses to organization management questions

Facility	Size ¹⁵	Total Employees	Full-time Employees	Part-time/Per diem Employees	Essential Personnel ¹⁶	Contact Personnel
1	Medium	113	70	43	All (113)	Phone (call or text)
2	Very Large	210-220	157-176	44-63	All (210-220)	Contact List
3	Medium	250-300	100	150-200	All Directors	Phone List/Email
4	Medium	80-85	67	-	All (80-85)	Phone
5	Large	140	105	35	Nursing, Department Heads, Superintendent	Phone
6	Medium	140	95	45	All (140)	Phone
7	Medium	72	62	10	40	Phone/Email
8	Medium	330	220	110	Nursing/Administrator	Phone
9	Large	370	258	112	Planning Operations- Environmental/Maintenance/ Clinical	HR Electronic System

¹⁴ Exact counts were not provided in certain interviews so top end of ranges have been used to do calculations.

¹⁵ Facility sizes were categorized as the following based on bed count – Very small (1-25), Small (26-75), Medium (76-120), Large (121-200), and Very Large (201+). Ranges were taken from the U.S. News and World Report – <https://health.usnews.com/best-nursing-homes>

¹⁶ Interview participants were not asked to provide total numbers of essential personnel.

10	Large	150-175	90-100	75	Directors	Phone
11	Small	496	346	150	Nursing, Food Service, Maintenance and Environmental Services	Phone
12	Medium	312	180	130	All (312)	Phone
13	Large	100	49	52	Directors, Nurses, Dietary	Phone
14	Medium	105	68	35	Nursing, Dietary, Maintenance, Housekeeping	No response
Total	1,514	2,956	1,896	1,060	-	-
Average	108	211	135	75	-	-

The next set of questions sought information on how facilities were implementing basic preparedness efforts at their facilities and any associated facilities. Under some circumstances the long-term care facilities were one of two or three facilities located on the same property (or nearby properties), e.g., an assisted living facility, a long-term care facility, and/or a nursing home. All have some commonalities with respect to preparedness expectations, but are under different regulations by the NJDOH (Standards for Licensure of Assisted Living Residences, Standards for Licensure of Long-Term Care Facilities, and Standards for Licensure of Nursing Homes, respectively)¹⁷.

Table 4.7. Interview questions related to Planning and Support

Number	Prompt
1.	<i>Does your facility have an emergency plan?</i>
2.	<i>Do you know whether the plan includes information for natural disasters?</i>
3.	<i>Has your facility ever been evacuated?</i> <i>a. If yes, what were the conditions that contributed to an evacuation taking place?</i> <i>b. If no, who made the final decision not to evacuate?</i>
4.	<i>Do you receive planning support from any other agency – such as a local health department or your local emergency manager?</i>
5.	<i>Are you aware of your facility having a continuity of operations plan? Will define what is meant by this.</i>
6.	<i>Are medical records stored on-site?</i>
7.	<i>Do you have any information or supplies being stored off-site?</i>
8.	<i>Do you have plans in place to get residents needed medications during an emergency?</i>
9.	<i>Do you have long-term plans to obtain medical treatment/medications for residents for an extended emergency (e.g. power outage)?</i>

¹⁷ N.J.A.C. 8:36, N.J.A.C. 8:39, and N.J.A.C. 8:34 respectively. For more details see the NJDOH Statutes, Rules and Rule Proposals website at: <http://www.nj.gov/health/healthfacilities/rules.shtml>

10.	<i>What plans are in place to evacuate residents, if needed, during an emergency?</i>
11.	<i>Do you have dedicated transportation available should you need to evacuate residents?</i>
12.	<i>Are these plans coordinated with your Municipality or County Office of Emergency Management?</i>

When asked if facilities had an emergency plan at their facility, all administrators indicated that yes they did. Not having an emergency plan in place would be a violation through the NJDOH regulatory program, so a facility administrator would have been apprehensive answering this question in the negative. Since participation in the interviews was voluntary it is the assumption that only facilities in compliance with state regulations would have been willing to participate.

Administrators were then asked what/if any natural hazards were included in their emergency plans. Five facilities had completed a vulnerability analysis to determine what hazards had the highest likelihood of impacting their facilities; while other facilities relied on staff expertise to determine what hazards should be included. All facility administrators indicated they included natural hazards as part of their overall emergency plans. One facility administrator indicated that:

Area of weather emergencies that includes our natural hazard plans – includes tornados, hurricanes, floods, earthquakes – developed because hazards have happened in this State or nearby.

- Facility Administrator

When asked if their facility has ever been evacuated, six facilities indicated they have experienced a partial evacuation of their buildings (none directly related to natural hazard events, but one was indirectly related because of wind damage), two facilities had undergone a full evacuation caused by a wildfire in one instance and a boiler explosion in the other. Five facility administrators indicated they had not experienced an evacuation at their facility but they have

had to shelter-in-place because of storm events such as snow storms. One facility administrator said they were asked to evacuate their facility because of Superstorm Sandy, “We were asked, but not mandated under Superstorm Sandy to evacuate. We chose to shelter in place based on our available resources.”

Questions 6 through 9 asked facility administrators about storage of residents’ medical records, access to resources such as medication and how they would obtain medication and medical treatment during emergency events (see Table 4.7 for full questions). Facility administrators indicated a relatively even split between resident medical records being stored as hardcopy or electronic. A few administrators indicated they had both present at their facility, others indicated they were in the process of moving their records from hardcopy over to electronic. Of the eight administrators that said their facilities used electronic storage for residents’ medical records, four indicated they had an additional offsite backup. Six facility administrators indicated they had generators on site that could power all or some of their facilities. All facility administrators mentioned having access to medications for residents through contracted or in-house pharmacies. Eight administrators said they had physicians they could contact to meet the medical needs of residents during an emergency event, while four administrators indicated they have physicians or nurses on staff that would handle medical needs during events.

Questions 10 through 12 asked administrators about their evacuation procedures, specifically asking if they had plans in place to transport residents from their facilities to other identified locations during an emergency event. Question 12 asked if their plans are coordinated with local emergency management officials, to understand the level of coordination with the emergency responder community. It has been recommended that facilities maintain their own

contracts to ensure resources are available to them (FHCA 2015), however some facilities interviewed remain reliant upon local government for support during disasters. One Director of Operations said the following regarding evacuation protocols in place at their facility:

Depends on the event; in a hurricane scenario there are a few days of preparation that can happen leading up to a storm event impacting a facility. In a no-notice event, such as a gas leak, we would evacuate residents as soon as possible off site and then communicate with local emergency managers regarding next steps.

- Director of Operations

An Executive Director also noted the following regarding their evacuation plans:

[We] would move residents out of the building to a staging area outside as long as the weather allowed for it. Evacuation procedures would depend on the type of event. Our Building Services Director is a specific essential role during a disaster because of knowing where and how to access resources during an emergency event.

- Executive Director

Facility administrators were evenly split between using their own transportation and/or contracting with outside companies to provide transportation for an event that would require evacuation of residents. A few facilities said they would use county available resources if they required large buses or other vehicles that were known to be accessible through emergency management offices.

The last question in the series of planning and support questions specifically asked “*Are these plans coordinated with your Municipality or County Office of Emergency Management?*”.

Nearly all facility administrators answered this question as a yes to sharing their emergency

plans with local and county offices of emergency management with one administrator specifically indicating the following:

Yes, [we are] required to send a copy of facility plan to local emergency manager on a yearly basis. Municipal OEM provides review.

- Executive Director

The last series of questions for facility administrators were related to place and aimed at understanding how interactive facilities were with their local emergency management community.

Table 4.8. Interview questions related to Municipality

Number	Prompt
1.	<i>Are you aware of where the municipal emergency manager is located? (Are they the fire chief, or municipal politician?)</i>
2.	<i>How often do you speak to your local emergency manager?</i>
3.	<i>Have you ever attended any meetings where local emergency managers were present?</i>
4.	<i>Have you attended any training(s) hosted by the emergency response community?</i>
5.	<i>How satisfied are you with the amount of communication between your facility and your local emergency responder community?</i>

All facility administrators indicated they were aware of where their municipal emergency manager is located. Some additionally contributed information about the dual-roles held by some of the emergency managers (e.g. fire marshal, fire chief, etc.), others indicated their emergency manager was a full-time position. The majority of participants said they speak to their local emergency manager at least once a year or “as needed”. All but one or two facilities indicated they had attended meetings and/or trainings hosted by the emergency management community or where the emergency management community were present. And when asked about their level of satisfaction with the “*amount of communication between your facility and your local emergency responder community*”, eight facilities indicated they were satisfied, four indicated they were very satisfied, and only one indicated the communication could use improvement.

Summary and Conclusions

Semi-structured interviews were conducted with two cohorts, emergency managers (13) and senior facility administrators (18) for a total of 31 interviews. Each cohort answered a series of open-ended questions aimed at finding out past experiences and present conditions of natural hazard preparedness efforts at senior facilities and their coordination with emergency agencies.

Respondents agreed to participate with the understanding they would not directly benefit from participating and that their identities would be confidential. Interview participants were identified through snowball methods as well as through self-selection as part of the survey component also completed as part of this research.

Critical components emerging from the perspective of emergency managers were for senior facilities to be self-sufficient and prepared to sustain themselves for the first 72-hours of a natural hazard event. This is essential to sheltering-in-place as outlined by Hyer et al. (Hyer et al. 2007). Having multiple contracts in place for resources during an event as well as practicable plans in place create facilities that are well prepared for possible storm events. This need was also highlighted in the literature by Howard (2012) who discusses how resources under contract with facilities have been reallocated by the government for other uses. This sentiment was restated during the interviews as having occurred recently in New Jersey after Superstorm Sandy. These interviews found that emergency managers were willing to assist senior facilities when needed, but under large scale emergency events would be spread too thin and would not be able to assist facilities as quickly.

Concern regarding senior facilities ability to obtain necessary resources was reiterated repeatedly during the interviews with emergency managers; however some facilities have identified preparedness activities which enhance their resiliency beyond what facilities may have

done in the past. For example, almost every facility interviewed has a plan for providing medication and medical attention as needed during a disaster. The facilities interviewed have clearly defined what role(s) are essential on staff and have protocols in place for communicating with staff, when needed. However, in past events, nursing staff has been unreliable (Berry 2012, Ladikta 2008, Qureshi 2001). Some emergency managers remained concerned that staff may be unreliable and felt that exercises on weekends and at night may provide additional perspective to facilities and their ability to maintain appropriate staffing levels during a disaster.

Additional emerging themes discovered from the conversations with senior facility administrators included 1) a misunderstanding in what coordination entails with emergency managers beyond providing a copy of a facility's emergency plan but actually having conversations with emergency managers about protocols in place to implement procedures outlined in plans. Identified as one of the largest gaps in prior studies (Hyer 2010, Howard 2012, Hyer 2012, Root 2007), engagement between facilities and the community are necessary to improve emergency planning and preparedness; and 2) the State should consider requiring yearly counts of emergency exercise invitations (from the municipal or county emergency coordinators) in the event federal or other entities make the formal request for information.

A few additional themes that emerged from conversations with facility administrators:

- The State should require a yearly update of facility points of contact so their [NJDOH] database is up-to-date and then the onus is on facilities to provide updates as needed throughout the rest of the year.
- There are facilities that are still unaware of how CMS rules will impact them directly. This type of knowledge gap has existed for more than a decade and still continues today (Root 2007).

- Some administrators indicated they completed a vulnerability analysis as part of their emergency plan development which was a best practice as identified by Hyer (2012).
- Some areas of the State are provided access to updates and information more frequently than other parts of the State. Request made to develop one place that facilities would know to go to for trainings and other information resources provided by the State/Counties/Municipalities.

Finally, additional themes that did not emerge from the interviews but were largely highlighted by the literature:

- There was a lack of discussion regarding the financial aspects of emergency preparedness planning from staff time and participation in training to ensuring cash reserves are on-site for use during an emergency event.
- Interviewees did not discuss considerations for mental health needs; a consideration that has been identified in past studies (Santos et al. 2014, 1062).
- Facility administrators should become familiar with emergency management procedures and terminology at a high level so they can communicate needs clearly to the local emergency management coordinators. This operational knowledge should include information such as the Federal Emergency Management Agency's (FEMA) Incident Management System per a recommendation from the Centers for Medicare and Medicaid Services' Emergency Preparedness (Hyer 2012, 45).

Chapter 5: Local Scale Case Study

Background and Setting

On October 18, 2017, I had the opportunity to attend an emergency exercise training held at a senior facility in Middlesex County. This training was one of three trainings that were held over the course of two weeks specific to a network of non-profit facilities. The exercise scenario was set up by the emergency management staff at the facility in coordination with the Middlesex County Emergency Manager. The morning of the exercise, staff involved in the exercise were briefed on the scenario and were told that there would be an explosion in the kitchen of the facility. Four people would be involved in the explosion, there were to be five victims and the maintenance person would be shutting off the gas due to a gas leak and the exercise was supposed to play out from there. The Middlesex County Office of Emergency Management Coordinator had notified emergency responders ahead of the exercise about the potential for calls to 911 and to notify appropriate authorities that a planned exercise would be held. I was standing in the front entrance of the facility observing from there along with two police officers from the township where the facility was located. We were to observe the events and then would have an opportunity to contribute to the debriefing after the exercise had concluded.

Recorded Events

The event was scheduled to begin at 10:00 am but began a few minutes later at 10:15am. Almost immediately after the exercise began there was an observed question by staff as to who was incident commander. Triage was staged in the center of the facility and was not observable from the main entrance. The lead emergency manager of the facility reminded staff to remind residents that the exercise was a drill. The code red was announced (i.e. the signal that the emergency had begun) over the loud speaker and the call line indicated it had come from the

laundry room. The kitchen staff walked toward the main entrance door, described injuries sustained by other staff and then remained at the front entrance throughout the remainder of the exercise.

Staff at the front desk made calls on their walkie-talkie to call for a nurse. In addition to the gas leak/explosion that was to have occurred in the kitchen area, there was a side story introduced about a pregnant staff person who went into labor during the emergency. At 10:41am the front staff person called 911 about the emergency. The woman who was in labor was wheeled toward the triage area in a wheel chair and eventually taken into an empty resident room to have her baby. During this time there were continued calls across the walkie-talkie where staff were asking each other about other staff, specifically whether staff were present in the laundry room area. At 10:42 am the request was made over the walkie-talkie to send a nurse back to the laundry area. There was observed yelling in the hallway during the exercise but I was not able to decipher who was doing it and what role they played.

Two injuries were reported in the dining area, although no other details were provided as to the circumstances of them being injured. At 10:45 am a call came across the walkie-talkie that two people were down and needed help. At 10:46 am a second call was made to 911. A call for a census count of all staff was made at 10:47 am, and count was immediately received back. At 10:48 am a call was made that indicated there were 22 visitors present in the facility and that they also needed to be accounted for. Observed actions by staff to begin locating visitors and complete the count. At 10:50 am a call was made to staff over the walkie-talkie that oxygen was needed in the laundry room. Just after the call for resources, another call was made that indicated there was a heart attack victim located in the dining room. At 10:53 am another call was made indicating someone was unconscious – but additional details were not heard. Another call was

made to confirm that all 22 visitors to the facility had been accounted for. Two calls were then made for wheelchairs in both the activities room as well as in the dining room. By 10:56 am all victims had been brought to triage and treated. In total, the emergency exercise lasted less than 30 minutes and the debrief began at 11:03 am.

The township police were offered the opportunity to provide feedback for the beginning of the debrief. One officer began by saying they applaud everyone involved for exercising, that it was important to continue to exercise. He stressed that it was also important to “maintain your cool and speak clearly into the radio” and that the incident commander role was not clear during the exercise. The officer made the recommendation that a ledger be kept or that notes were written down during the event to establish a chain of events that had been completed and to provide immediate feedback to the incident commander. An officer also offered the recommendation to use an easel to write down the main aspects of the emergency.

Staff then indicated that all victims had been evacuated out of the impacted area(s) within six minutes of the exercise start. One of the officers raised the question of when the 911 phone call was made and indicated that during a real emergency event that once 911 is dialed the phone can be left off the hook and that emergency personnel would respond. The incident commander role¹⁸ is the person that holds authority and responsibility for an emergency event. The incident commander role was also discussed in more detail and staff indicated that that the staff person in that role felt isolated and did not have supporting staff to help write down events. Questions were also raised by officers regarding the location of triage and how many injured were actually brought to the triage area. The topic of the main triage nurse being pulled from the triage area to help with other areas was also discussed.

¹⁸ <https://training.fema.gov/emiweb/is/icsresource/glossary.htm>

A few key takeaways from the debrief meeting:

- 1) The person holding the incident commander role should make themselves known and repeat their position at least three times once an emergency event begins.
- 2) Staff should be trained on the use and process of using handheld radios (i.e. walkie-talkies).
- 3) The Assisted Living facility located on the same property was never notified of the emergency event – even if it was an exercise.
- 4) How will alternate staff handle the same exercise and situations on the 2 AM shift? It was the intention of the Facility Emergency Coordinator and the Middlesex County Coordinator to test that scenario soon.

Reflections

The overall event seemed a bit chaotic from an observer standpoint. There were several moving pieces but from my observation it seemed that everyone was trying to figure out the processes and their role as the emergency exercise played out. There was also some confusion by staff members as to whether guests visiting residents at the facility were allowed to leave during the emergency exercise. The guests were ultimately held as observers until the exercise was over, but this should be clearly outlined to staff for future events. Staff did not go to the front entrance of the facility to meet officers that had been called. There was no way officers could engage with the staff or victims in the exercise without being briefed on the current status of the exercise.

Next Steps

I requested a copy of the after action report or improvement plan that was developed from the emergency exercises that were held by the facility in the fall of 2017. Outcomes reported from the exercise were the following included items similar to my observations (i.e.

employees confused by their responsibilities, communication around incident command needs to be improved, and communication method through two-way radios need to be clearer). Also included as part of the outcomes were that residents were evacuated from danger zone successfully and there was some confusion on the implementation of the staging area and overall triage. The action plan then reflected how the importance of emergency drills is to identify areas of improvement and how training of staff needs to continue often enough that response actions become automatic. The Action Plan identified areas for improvement based on the following recommendations:

- Additional training on ICS needed for all managers including nursing staff.
- Additional training for nursing staff on how to set-up triage during an emergency.
- Train staff on two-way radio use on a monthly basis.
- Train staff on drill procedures and staff responsibilities by holding and participating in tabletop exercises throughout the year.
- Develop training modules for all staff on the Emergency Response Plan.
- Runners provide an opportunity to improve communication during an emergency event. Staff need to be educated on the use of runners during a disaster.
- Develop standard forms in order to account for both staff and residents during a disaster event.
- Increase frequency of disaster drills to twice a year.

An implementation plan was not included that outlined how these recommendations would be moved forward in practice. It was, however, encouraging to see that the facility identified the need for staff to be trained on procedures outlined in their emergency plan. It was also

encouraging to see the recognition to increase disaster drill frequency to twice a year, although I might be inclined to remind them that this is now a regulatory requirement under the CMS Rule.

Chapter 6: Summary and Conclusions

Summary of Findings

The risks posed to long-term care facility residents and the destruction and loss of life by several facilities during Hurricane Katrina and in the aftermath of many disasters since has raised the awareness of society, leaders, and facility owners and operators to the importance of emergency preparedness. This thesis examined New Jersey as a case study of current preparedness processes to understand the state of practice across the State as well as identify areas for improvement. This thesis sought to understand the level of preparedness at senior facilities in New Jersey, as well as their coordination with the local emergency response community.

The results of the mixed methods used in this research describe findings that begin to answer the questions posed, but by no means are answered with absolute findings. Future work could pick up where this research ends to examine additional aspects of senior facilities such as resident populations, as well as other social and economic characteristics of municipalities they are located in to gain a more comprehensive view of overall vulnerabilities and what measures individual facilities are implementing to address those vulnerabilities.

Research Sub-Question 1: How does the size of a facility and association (i.e. profit versus non-profit) affect its ability to prepare and respond to disaster events more effectively?

Size and association were examined during multiple phases of this research. The senior facility database used for survey contacts and the spatial analysis pieces of this research contained information about bed count (i.e. size) and whether facilities were non-profit, for-profit, or otherwise categorized based on funding resources (i.e. association). The results from the survey indicated there was no significant relationship between ownership type and overall

level of preparedness as examined through two factors 1) elements of facility's emergency plans, as well as 2) their access to emergency resources. These results are supported by a similar study conducted by Eiring et al. (2012) which found no relationship between nursing home attributes and five measures of emergency preparedness.

Size was not examined through the survey because of the confidentiality of survey respondents and questions not being specifically posed to facility administrators about bed count. Size was examined further during the semi-structured interviews with facility administrators; however findings from those also do not suggest that size has a correlation to a facility's ability to prepare and/or respond more effectively to disaster events.

While previous research such as that by Castle (2008) found that for-profit and larger facilities (i.e. bed numbers) were more likely to receive a citation by Department of Health regulators for inadequate emergency plans, those same findings were not replicated through this research. Given the belief that organizational actions are based on risk perception of individuals in management positions, and that management is also influenced by societal expectations, facility size and its association may not have an effect on an organization's effort to be prepared.

Resources were identified and stressed throughout the interviews conducted as part of this research as a primary concern of emergency managers in their assurance senior facilities will be prepared and effective in their response to a natural hazard event. While a facility's overall association with a corporation or other for-profit connection may contribute to a facility's level of preparedness, it is not the only consideration, nor does it put them at a clear advantage over other types of facilities such as non-profits. Instead, having previous experience with an emergency event such as a fire or building damage caused by weather events showed to have a greater impact on a facility's overall level of preparedness and the effectiveness of that

preparedness (e.g. were the facility's staff adequately trained on emergency preparedness procedures).

Consequentially, risk perception remains as a possible explanation for whether a facility is able to prepare and respond to a disaster. Since perception is an individual attribute and the influences to one's own risk perception vary greatly from person to person, it is reasonable to assume that distribution of leadership and management personnel who perceive hazards at a higher level of risk are a stronger indicator of overall preparedness without regard to organizational attributes. It is worth noting that during the interviews with emergency managers, many felt there was a high turnover rate for facility employees responsible for emergency preparedness. While this was not a direct finding of this research, it would be an important factor to consider for future research. As senior facility managers, administrators, and other personnel move on, the continual change of leadership could result in a lack of organizational culture and therefore impact a facility's level of overall emergency preparedness. This in turn, may result in a facility in a constant state of flux depending on the expertise of the staff in those positions and the prioritization given to emergency preparedness.

Research Sub-Question 2: Do senior facilities place an additional burden on the already overburdened municipalities they are located in?

The literature in Chapter 2 outlines that implementation of risk controls through social organizations has proved to successfully reduce an organization's risks to lower levels (Busby et al. 2014). This similarly was found to be the case in New Jersey as well. Organizationally, the New Jersey Department of Health created a working group among facilities in the Southern MCC Region prior to Hurricane Irene. The planning, coordination, and overall preparedness that occurred was viewed as being successful by State and local government, as well as senior care

facilities located in the region and was proven effective as the region responded to both Hurricane Irene and Superstorm Sandy storm events.

In areas where facilities are actively engaged in community emergency planning, the burden on municipalities and local resources is reduced. In agreement with Chess et al. (1992) the findings suggest that the success of a risk management plan is contingent upon how those risks are shared and communicated within the organization and outside of the organization. Throughout this research, emergency managers identified repeatedly the importance of facilities being self-reliant during an emergency event.

Areas in the Southern MCC Region were found to be more aware of emergency preparedness trainings and meetings offered whereas those in the North Central and North East MCC Regions do not currently have the same social structure and information sharing and facility administrators were not as aware of trainings and exercises occurring throughout the area. Another finding of this research was that the same regions were also less likely to be aware of the newest regulatory requirements and understanding of the impacts those new requirements would have to those facilities. The findings from this research align with those outlined by Pierce et al. (2017) which found that coordination with “emergency management agencies and health care coalitions, participating in community exercises, and coordinating planning and response with long-term care ombudsman programs” was necessary following storm events such as Superstorm Sandy.

Municipalities in the Central East (i.e. 17), North East (i.e. 10), and Southern (i.e. 11) MCC Regions were shown to be impacted by a higher proportion of natural hazard events through the spatial analysis conducted through this research than the Central West and North West Regions. That is not to say that all senior facilities should not be prepared for natural

environmental hazard events, but it helps to highlight areas where emergency resources may be scarce under even smaller scale scenarios because of broader impacts to municipalities.

Overall, senior facilities that lack the interest or ability to prepare for disasters will continue to place additional burden on municipality emergency services. Some facilities stated outright they would require local resources during an emergency event. Other facilities that are proactive in identifying resources through contracts and agreements reduce the burden on municipalities but do not alleviate the burden entirely. As the literature and results of the interviews outlined, contracted agreements with resource providers may not be enough to ensure resource availability in a disaster. This was highlighted further by Pierce et al. (2017) who found a 2006 report that stated even well prepared and trained nursing homes experienced logistical problems and poor outcomes during disaster events. Emergency managers are aware that support may be needed in emergency events regardless of the level of preparation a facility conducts. However, pre-planning, continued stakeholder engagement, and facility self-reliance through staff training on emergency procedures significantly reduces the burden on emergency managers and local emergency services who have limited resources to support senior facility emergency operations during large scale or long duration disasters.

Research Sub-Question 3: What gaps exist in current planning efforts of senior facilities and how do those gaps impact public service providers?

As stated before, facility resources and self-reliance remain the emergency management community's primary concerns for senior facility preparedness efforts. Gaps remain a statewide concern due to the limited number of resources available. Resources contracted by one facility may also be under contract with another or utilized by a different industry all together when a larger scale emergency impacting a large area occurs. This was seen in prior disaster events such as Superstorm Sandy, and as outlined with additional examples provided in the literature and

within the qualitative research piece of this study. However, continued pre-planning, agreements and contracting for resources before an emergency event does help to alleviate some burden on local government resources and should continue to be one strategy to address planning gaps.

Federal and State regulations pertaining to requirements in emergency preparedness procedures help to elucidate some of the recommendations resulting from this research. Tables 6.1 and 6.2 below describe the federal and State requirements of senior facilities to prepare for natural hazard events. While the language from the federal regulations is broad enough to encompass all types of hazards (i.e. man-made and natural) it does not provide guidance on how to identify specific hazards for individual areas. Identified as a recommendation coming out of this research, the NJDOH should help all senior facilities by providing resources on best practices of how to identify and plan for specific hazards that may impact them.

Table 6.1. Federal regulations specific to natural hazard emergency preparedness for senior facilities*

§ 483.75 Administration	Description
(m)	Disaster and emergency preparedness
(1)	Facility must have detailed written plans and procedures to meet all potential emergencies and disasters, such as fire, severe weather, and missing residents.
(2)	Facility must train all employees in emergency procedures when they begin to work in the facility, periodically review the procedures with existing staff, and carry out unannounced staff drills using those procedures.

*Taken from State Regulations Pertaining to Disaster/Emergency Preparedness, 2011.

Table 6.2. New Jersey regulations specific to natural hazard emergency preparedness for senior facilities*

8:39-9.4 Mandatory Notification	Description (may have been shortened for brevity)**
(e) 4	Facility shall notify the NJDOH immediately by telephone, followed with 72 hours by written confirmation of any of the following: fires, disasters, deaths, and imminent dangers to a resident's life or health resulting from accidents or incidents in the facility.
8:39-13.4 Mandatory Communication	
(a)	Each service shall conduct an orientation program for new employees of that service unless the orientation program is conducted by the administrator or a qualified designee.
(a) 3	The orientation program for all staff should include...procedures to be followed in case of emergency.
(c) 1	At least one education training program each year shall be

	held for all employees on each of the following topics: procedures to follow in case of emergency...
8:39-31.6 Mandatory Fire and Emergency Preparedness	
(f)	The facility shall have a written comprehensive emergency operations plan developed in coordination with the local office of emergency management.
(f) 1	Identify potential hazards that could necessitate an evacuation, including natural disasters, national disasters, industrial and nuclear accidents, and labor work stoppage.
(f) 2	Identify the facility and an alternative facility to which residents would be relocated, and include signed, current agreements with the facilities.
(f) 3	Identify the number, type and source of vehicles available to the facility for relocation and include signed current agreements with transportation providers. Specially configured vehicles shall be included.
(f) 4	Include a mechanism for identifying the number of residents, staff, and family members who would require relocation and procedures for evacuation of non-ambulatory residents from the facility.
(f) 5	List the supplies, equipment, records, and medications that would be transported as part of an evacuation, and identify by title the individuals who would be responsible.
(f) 6	Identify essential personnel who would be required to remain on duty during the period of relocation.
(f) 7	Identify by title and post in a prominent place the name(s) of the persons who will be responsible for communication procedures under all hazard events.
(f) 8	Describe procedures for how each item in (f)7 above will be accomplished.
(g)	There shall be a written plan for receiving residents who are being relocated from another facility due to a disaster. This plan shall include at least an estimate of the number and type of residents the facility would accommodate and how staffing would be handled at different occupancy levels
(h)	Copies of the emergency operations plan shall be sent to municipal and county emergency management officials for their review.
(i)	The administrator shall serve as, or appoint, a disaster planner for the facility.
(i) 1	The disaster planner shall meet with county and municipal emergency management coordinators at least once each year to review and update the written comprehensive evacuation plan; or if county or municipal officials are unavailable for this purpose, the facility shall notify the State Office of Emergency Management
(i) 2	While developing the facility's evacuation plan, the disaster planner shall coordinate with the facility or facilities

	designated to receive relocated residents.
(j)	Any staff member who is designated as the acting administrator shall be knowledgeable about and authorized to implement the facility's plans in the event of an emergency.
(k)	All staff shall be oriented to the facility's current plans for receiving and evacuating residents in the event of a disaster, including their individual duties.
(l)	The facility shall ensure that residents receive nursing care throughout the period of evacuation and return to the original facility.
(m)	The facility shall ensure that evacuated residents who are not discharged are returned to the facility after the emergency is over.
(n)	The facility shall maintain at least a three-day supply of food and have access to an alternative supply of water in case of an emergency.
(o)	The facility shall conduct at least one evacuation drill each year, either simulated or using selected residents. State, county, and municipal emergency management officials shall be invited to attend the drill at least 10 working days in advance.
(p)	The facility shall establish a written heat emergency action plan which specifies procedures to be followed in the event that the indoor air temperature is 82 degrees Fahrenheit or higher for a continuous period of four hours or longer.
(p) 1	These procedures shall include the immediate notification of the Department of Health and Senior Services.
(p) 2	In implementing a heat emergency action plan, a facility shall not prevent a resident from having a room temperature in his or her resident room in excess of 82 degrees Fahrenheit if the resident and the resident's roommate, if applicable, so desire, and if the resident's physician approves.
(p) 3	A heat emergency plan need not be implemented if the resident care areas are not affected by an indoor temperature in excess of 82 degrees Fahrenheit.
(p) 4	The heat emergency action plan shall include a comprehensive series of measures to be taken to protect residents from the effects of excessively high temperatures.
8:39-32.2 Advisory Fire and Emergency Preparedness	
(a)	The facility conducts at least two evacuation drills each year, either simulated or using selected residents, at least one of which is conducted on a weekend or during an evening or night work shift. Results of the drills are to be summarized in a written report, which is shared with the county and municipal emergency management coordinators.
(b)	A municipal, county, or State emergency management

	official conducts an education or training program in the facility on disaster planning and emergency preparedness at least once a year.
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*Taken from State Regulations Pertaining to Disaster/Emergency Preparedness, 2011.

** Shortened descriptions did not change the language or meaning.

In addition to physical resources, planning involves a large amount of relationship building. Recent events from Winter Storm Riley (March 3, 2018), show how important good communication is between senior facilities and emergency managers. During this event, a senior facility located in the Southern MCC Region lost power during the storm; and while the facility had a generator on premises the generator also mal-functioned. The facility is well known to the local emergency responder community and a full evacuation occurred with the help of county resources. The relationships established before hazard events are key to emergency managers being able to properly prioritize the needs of senior facilities along with other population needs. The continued engagement among stakeholders in the Southern MCC Region highlights the need for emergency managers to engage senior facilities and vice versa. The limited interactions identified between these stakeholders in other regions of the State remains a gap that should continue to be addressed.

Primary Question to be examined: To what extent is hazard preparedness and response planning coordinated between local emergency response agencies and senior facilities, and how can communication and coordination be improved?

The sub-questions examined as part of this research lead up to the conclusions that can help contribute to a response to the primary question being examined. This research found that there is coordination between local (i.e. municipal or county) emergency managers and senior facilities located within their jurisdictions. The level of coordination varies depending on the MCC Region of the State the facility is located in as well as the individual importance coordination and collaboration are perceived by both the facility administrators as well as the emergency managers.

Findings from this research suggest that senior facility administrators are the key component to whether a facility has effective emergency preparedness procedures in place. A senior facility administrator's lead indicates whether staff will be adequately trained and confident in emergency preparedness procedures (at all times of day/different shifts) as well as the type of relationship (or absence of a relationship) established with the local emergency response community.

Facility resources and self-reliance were the most important outcomes from conversations with the emergency management community for senior facility preparedness efforts. Pre-planning, including contracting with multiple resource providers, continued stakeholder engagement, and developing self-reliance through staff training on emergency procedures helps to significantly reduce the burden on emergency managers and local emergency services. By providing trainings and information on how to accomplish those goals to all the NJDOH MCC Regions in New Jersey would help to alleviate some of the information gaps that seem to exist in parts of the State over others and allow for equal access to lessons learned and best practices that can be employed at all senior facilities.

Limitations

This research did not ask senior facilities about their resident populations which would be needed for use in a vulnerability analysis. Because of the sensitivity of possible information being used against facilities as part of State inspections, I chose to stay away from specific topics that might have made senior facility administrators shy away from answering openly and honestly. Once a report has been established with individual senior facilities, more specific types of information, such as proportion of resident populations, may be easier to be granted access to. For the same reasons, access to individual facility's emergency plans was also not requested.

Due to the regulatory requirements which require facilities to have emergency plans, overall participation in this study may have resulted in self-selection bias by facility administrators in which those who are not in violation of regulatory requirements were more willing to participate. Additionally, as outlined in Chapter 2, Sadiq and Graham (2015) pointed out that the literature shows that predictors of preparedness for organizations are limited by sample size, geographic scope, and the fact the results are not generalizable (Sadiq & Graham 2015). This research contained many of the same limitations.

One specific complication from the process used for survey distribution was the anonymous link generated by the web-based software - https://rutgers.qualtrics.com/SE/?SID=SV_7NU6AjHZDK3Ywdf. This link contained an underscore that was hard to decipher on a hard copy mailings because of the automatic underline of the hyperlink and may have impacted the overall response rate for the survey.

Also, the hazard assessment completed as part of this research was based on an unweighted linear model to evaluate and identify areas of potential impacts to senior facilities/municipalities. Because the model included multiple factors for flood hazards (e.g. three factors for one sea level rise category), the model did skew towards impacts from those hazards over other types. Future models should be weighted to account for the larger number of flood hazards.

Research Contributions

This research seeks to contribute to the conceptual models that have been developed that describe both social capital (Greenberg 2014c, Patterson et al. 2009) and community-based disaster management (Patterson et al. 2009, Chen et al. 2006). This research contributes to these topics by describing how communities within larger communities (e.g. residents within senior

facilities within NJ municipalities or senior facility administrators and emergency managers) coexist, receive and provide communications, and coordinate during times of natural environmental hazard events (as outlined largely in the methods and conclusions described in Chapters 3 and 4). This research also seeks to contribute to the larger body of existing literature around prevention and resilience including management of perceptions of risk, facility risk management policies, and state-society relations. This research highlights and extends on these by describing the interactions between state institutions (i.e. county and local emergency managers) and societal groups (i.e. senior facilities) to negotiate how preparedness efforts are handled and how they can be influenced by individuals and/or by specific organizations.

Populations living within senior facilities are the most vulnerable to effects from natural and man-made disasters (Greenberg 2014c) because of their reliance on other people and resources to help with their daily activities. The staff and emergency preparation procedures that occur at these facilities are an important aspect to examine because of the negative consequences poor preparation may have on the residents and their families. Some areas within this study region showed to be at an increased risk to potential hazards than other areas of the State.

This research will help inform possible improvements in public safety and wellbeing of residents of senior healthcare facilities through examination of existing conditions and by making recommendations for better pre-planning and implementation of required emergency preparedness plans. This research also addresses a larger policy issue on the extent to which the presence of senior facilities is a burden to the municipalities in which they are located and what considerations should be made so that the municipalities may respond accordingly.

Future Considerations

The findings from this research help to elucidate additional opportunities for research in the future. Future research may want to address political justice implications by examining in more depth what facilities are vulnerable to natural environmental hazard events as well as who the people are living in the facilities that are most at risk. This can be completed through the use of a weighted factor model that examines facility vulnerability to impacts from environmental hazard events or as an alternative, to examine suitable areas where senior facilities could be built that would remove them from areas highly likely to be impacted from environmental hazard events.

Additional spatial analyses could also be used to examine accessibility to and from senior facilities under normal conditions, and through using the network analysis toolkit, under evacuation or hazard event conditions with impedances present. Accessibility under the latter conditions could be tested by identifying locations of major contractors used by senior facilities for resources and to examine whether road access to those locations may be compromised under certain conditions.

An opportunity also exists to establish a longitudinal study to examine what effect previous encounters with storm events has on the overall importance of senior facility preparedness and coordination with local emergency services. These stakeholders understand the importance of coordination and access immediately before or after a hazard event, but how long after those same events do those epistemologies remain or is there a time period threshold where those understandings and responsibilities level off.

Another finding from this study was on the wide variety of emergency exercises that are completed by senior facilities to meet the regulatory requirement of having completed

emergency natural hazard exercises. Additional research could be conducted to understand perception of level of expertise with the contracted resources that were found to be largely utilized and whether those exercises were adequately testing senior facility's systems to identify areas of improvement before an actual emergency event takes place.

Future research could also be used to examine at what point the system (i.e. emergency services) breaks under different scenario simulations. Findings from this research showed that emergency managers were confident in their resources for a single facility need or under smaller scale scenarios. That confidence waned when larger scale events were discussed such as a hurricane scenario. Examining the number of facilities in each municipality, the historic frequency of hazard events, resident populations, and accessibility to needed resources could be modeled to understand at what threshold local (or even regional) services would no longer support senior facilities during an emergency event.

Bibliography

Aldrich, N., & Benson, W. F. (2008). Peer reviewed: disaster preparedness and the chronic disease needs of vulnerable older adults. *Preventing chronic disease*, 5(1).

Associated Press. (2017, October 30). Nursing homes struggled with choice to evacuate in hurricane. Retrieved March 1, 2018, from <https://wtop.com/national/2017/10/nursing-homes-struggled-with-choice-to-evacuate-in-hurricane/slide/1/>

Atkinson, R., & Flint, J. (2001). Accessing hidden and hard-to-reach populations: Snowball research strategies. *Social research update*, 33(1), 1-4.

Bai, Y., Kaneko, I., Kobayashi, H., Kurihara, K., Takayabu, I., Sasaki, H., & Murata, A. (2014). A Geographic Information System (GIS)-based approach to adaptation to regional climate change: a case study of Okutama-machi, Tokyo, Japan. *Mitigation and adaptation strategies for global change*, 19(5), 589-614.

Bankoff, G., Frerks, G., & Hilhorst, D. (Eds.). (2004). *Mapping vulnerability: disasters, development, and people*. Routledge.

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human relations*, 61(8), 1139-1160.

Berry, D. (2012). Who will show up? Estimating ability and willingness of essential hospital personnel to report to work in response to a disaster. *Online journal of issues in nursing*, 17(2), J1.

Blanchard, G., & Dosa, D. (2009). A comparison of the nursing home evacuation experience between Hurricanes Katrina (2005) and Gustav (2008). *Journal of the American Medical Directors Association*, 10(9), 639-643.

Busby, J. S., & Collins, A. M. (2014). Organizational sensemaking about risk controls: the case of offshore hydrocarbons production. *Risk Analysis*, 34(9), 1738-1752.

Castle, N. G. (2008). Nursing home evacuation plans. *American journal of public health*, 98(7), 1235-1240.

Caruson, K., & MacManus, S. A. (2011). Gauging Disaster Vulnerabilities at the Local Level: Divergence and Convergence in an "All-Hazards" System. *Administration & Society*, 0095399711400049.

Centers for Medicare & Medicaid Services (CMS). (2017). *Appendix Z: Emergency Preparedness Final Rule Interpretive Guidelines and Survey Procedures*. Department of Health and Human Services.

Chen, L. C., Liu, Y. C., & Chan, K. C. (2006). Integrated community-based disaster management program in Taiwan: a case study of Shang-An village. *Natural Hazards*, 37(1), 209-223.

Chess, C. (2001). Organizational theory and the stages of risk communication. *Risk Analysis*, 21(1), 179-188.

Chess, C., Saville, A., Tamuz, M., & Greenberg, M. (1992). The Organizational Links Between Risk Communication and Risk Management: The Case of Sybron Chemicals Inc. *Risk Analysis*, 12(3), 431-438.

Colby, S. L., & Ortman, J. M. (2015). Projections of the size and composition of the US population: 2014 to 2060. *US Census Bureau*, 9.

Cutter, S. L. (2003). GI science, disasters, and emergency management. *Transactions in GIS*, 7(4), 439-446.

Cutter, S.L., (1996). Vulnerability to environmental hazards., *Progress in Human Geography*, 20 (4), pp.529-539.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.

Disaster Declarations for New Jersey. FEMA Website. Accessed on February 8, 2015.
https://www.fema.gov/disasters/grid/state-tribal-government/37?field_disaster_type_term_tid_1=All

Donner, W., & Rodríguez, H. (2008). Population composition, migration and inequality: The influence of demographic changes on disaster risk and vulnerability. *Social Forces*, 87(2), 1089-1114.

Dunwoody, S., & Peters, H. P. (1992). Mass media coverage of technological and environmental risks: A survey of research in the United States and Germany. *Public understanding of science*.

Eiring, H., Blake, S. C., & Howard, D. H. (2012). Nursing homes' preparedness plans and capabilities. *American journal of disaster medicine*, 7(2), 127-135.

Enarson, E. P. (2000). *Gender and natural disasters*. Geneva: ILO.

Federal Emergency Management Agency (FEMA) Modeling Task Force (MOTF) website.
Retrieved from <https://data.femadata.com/MOTF/>

Fernandez, L. S., Byard, D., Lin, C. C., Benson, S., & Barbera, J. A. (2002). Frail elderly as disaster victims: emergency management strategies. *Prehospital and disaster medicine*, 17(02), 67-74.

Florida Health Care Association. (2015). Hurricane Summit Proceedings, February 27 and 28, 2006. *American Health Care Association Web Site*. http://www.ahcancal.org/facility_operations/disaster_planning/Documents/HurricaneSummitHartfordReport.pdf.

Florida Health Care Education and Development Foundation. (2008). National Criteria for Evacuation Decision-Making in Nursing Homes. Retrieved from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiWrMiElpnXAhXFPCYKHYYooAnkQFggpMAA&url=https%3A%2F%2Fwww.in.gov%2Fisdh%2Ffiles%2FNationalCriteriaEvacuationDecisionMaking.pdf&usg=AOvVaw1BkIjgMuBjLymbiweo75mk>

Florida House of Representatives, Select Committee on Hurricane Response & Preparedness. (2018) Final Report dated January 16, 2018. Retrieved from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjRoPK1uTZAWhEpFkKHb1GBYMQFggpMAA&url=http%3A%2F%2Fflisamillerassociates.com%2Fwp-content%2Fuploads%2F2018%2F02%2FFinal-Report-of-the-House-Select-Committee-on-Hurricane-Response-and-Preparedness-1-16-18.pdf&usg=AOvVaw3z8iQHGPW67aYVQ_6cjwK0

Franklin, B. A. (1985, August 12). TOXIC CLOUD LEAKS AT CARBIDE PLANT IN WEST VIRGINIA. *The New York Times*. <http://www.nytimes.com/1985/08/12/us/toxic-cloud-leaks-at-carbide-plant-in-west-virginia.html>

General Licensure Procedures and Enforcement of Licensure Regulations, N.J.A.C. 8:43E, 2006.

Glik, D. C. (2007). Risk communication for public health emergencies. *Annu. Rev. Public Health*, 28, 33-54.

Greenberg, M., Weiner, M., Noland, R., Herb, J., Kaplan, M., and Broccoli, T. (2014a). Public Support for Policies to Reduce Risk after Hurricane Sandy, *Risk Analysis, An International Journal*, 34(6), 997-2012.

Greenberg, M. (2014b). Energy Policy and Research: The Underappreciation of Trust. *Energy Research and Social Science*, 1, 152-160.

Greenberg, M. (2014c). Protecting Seniors Against Environmental Disasters: From Hazards and Vulnerability to Prevention and Resilience. Routledge.

Howard, D., Blake, S. (2012). Improving Disaster Planning in Nursing Homes and Home Health Agencies [Powerpoint slides]. Retrieved from https://emergency.cdc.gov/coca/ppt/2012/05_08_12_homehealth_fin.pdf

Hyer, K. (2012). For long-term care, readiness gaps abound. *Health progress (Saint Louis, Mo.)*, 94(6), 42-49.

Hyer, K. Thomas, K. S., Dosa, D., Bond, J., Polivka-West, L., & Schinka, J. A. (2010). Improving relations between emergency management offices and nursing homes during hurricane-related disasters. *Journal of Emergency Management*, 8(1).

Hyer, K., Polivka-West, L., & Brown, L. (2007). Nursing homes and assisted living facilities: Planning and decision making for sheltering in place or evacuation. *Generations*, 31(4), 29-33.

IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.

Joint Center for Housing Studies of Harvard University. (2016) Projections & Implications for Housing a Growing Population: Older Households 2015-2035. Accessed October 17, 2017. http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/harvard_jchs_housing_growing_population_2016.pdf.

Laditka, S. B., Laditka, J. N., Xirasagar, S., Cornman, C. B., Davis, C. B., & Richter, J. V. (2008). Providing shelter to nursing home evacuees in disasters: lessons from Hurricane Katrina. *American Journal of Public Health*, 98(7), 1288-1293.

Laditka, S. B., Laditka, J. N., Xirasagar, S., Cornman, C. B., Davis, C. B., & Richter, J. V. (2007). Protecting nursing home residents during emergencies or disasters: An exploratory study from South Carolina. *Prehospital and disaster medicine*, 22(1), 42-48.

Lathrop, R., Bogner, J., Buenaventura, E., Rovito, J., & Trimble, J. (2013). New Jersey Coastal Flood Exposure Assessment. Retrieved from <http://nebula.wsimg.com/371031cafb163d05b7f380c712c8ed54?AccessKeyId=ACB457C88AE224CE0A00&disposition=0&alloworigin=1>

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. Sage Publications.

LCS. (2012). *Risk Mitigation in Senior Living: Emergency Preparedness and Protecting a Community from Crippling Failures* [White paper]. Retrieved May 5, 2015 from Leading Age website: <http://www.lcsnet.com/about-us/request-a-white-paper/>

Leinhos, M. R., Howard, D. H., & Blake, S. C. (2012). Improving disaster planning in nursing homes and home health agencies.

Licon, Gomez. "Nursing homes swamped Florida governor's phone after Irma" MyNorthwest. January 12, 2018 URL Last Accessed: mynorthwest.com/865894/florida-governors-cellphone-was-bottleneck-in-irma-response/

Levinson, D. R., & General, I. (2012). *Gaps continue to exist in nursing home emergency preparedness and response during disasters: 2007–2010*. Department of Health and Human Services, Office of Inspector General. Retrieved from <http://ltcombudsman.org/uploads/files/library/oigreport.pdf>.

Manfreda, K. L., Berzelak, J., Vehovar, V., Bosnjak, M., & Haas, I. (2008). Web surveys versus other survey modes: A meta-analysis comparing response rates. *International journal of market research*, 50(1), 79-104.

Merchant, J. W. (1994). GIS-based groundwater pollution hazard assessment: a critical review of the DRASTIC model. *Photogrammetric engineering and remote sensing*, 60, 1117-1117.

Mileti, D.S., (1999). Disasters by Design: A Reassessment of Natural Hazards in the United States. pp.1-372.

Milstein, K and Rosenbaum, S. (2017) "Need Help ASAP. The Story Behind the Photo of Nursing Home Residents Trapped in Hurricane Flood Water" Time. Retrieved from time.com/4917743/la-vita-bella-nursing-home-dickinson-texas-photo/

Mitchell, J. K. (2009). American Disasters during the Twentieth Century: The Case of New Jersey. In *Natural Disasters, Cultural Responses: Case Studies Toward a Global Environmental History*., In *Natural Disasters, Cultural Responses*. pp.327-354.

Mitchell, J.K., (1989). Hazards Research., In *Geography in America*. pp. 410–424.

Mitchell, J. T., Borden, K. A., & Schmidlein, M. C. (2008). Teaching hazards geography and geographic information systems: A middle school level experience. *International research in geographical and environmental education*, 17(2), 170-188.

National Institute of Standards and Technology (NIST) Website. Accessed on February 19, 2018 <http://www.itl.nist.gov/div898/handbook/prc/section4/prc431.htm>

National Park Service (NPS) Website. Accessed on April 12, 2018 <https://www.nps.gov/pine/index.htm>

National Weather Service (NWS) Website. Accessed on April 3, 2015 <http://www.weather.gov/okx/HurricaneSandy>

New Jersey Climate Adaptation Alliance. (2016) Integrating Climate Science into Coastal Resilience Planning and Decision Making in New Jersey. Retrieved from <http://njadapt.rutgers.edu/docman-lister/conference-materials/169-stapsummaryfinal-october-2016>

New Jersey Department of Environmental Protection (NJDEP), Coastal Management Program website. Accessed on April 4, 2015. http://www.state.nj.us/dep/cmp/czm_hazards.html

New Jersey Department of Health (NJDOH) Website. Division of Health Facilities Evaluation and Licensing. Accessed on March 31, 2015. <http://www.state.nj.us/health/healthfacilities/search.shtml>

O'Brien, K. et al. (2008). Disaster Risk Reduction, Climate Change Adaptation and Human Security. Report prepared for the Royal Norwegian Ministry of Foreign Affairs by the Global Environmental Change and Human Security (GECHS) Project, GECHS Report 2008: 3.

Ortman, J. M., Velkoff, V., & Hogan, H. (2014) *An Aging Nation: The Older Population in the United States*, Current Population Reports, P25-1140. U.S. Census Bureau, Washington, DC.

Oltedal, S., Moen, B. E., Klempe, H., & Rundmo, T. (2004). Explaining risk perception: An evaluation of cultural theory. *Rotunde*, 85, 17-25.

Patterson, O., Weil, F., & Patel, K. (2010). The role of community in disaster response: conceptual models. *Population Research and Policy Review*, 29(2), 127-141.

Peek, L., (2010). Age., In *Social Vulnerability to Disasters*. pp.155-185.

Pierce, J. R., Morley, S. K., West, T. A., Pentecost, P., Upton, L. A., & Banks, L. (2017). Improving long-term care facility disaster preparedness and response: a literature review. *Disaster medicine and public health preparedness*, 11(1), 140-149

Powell, S., Plouffe, L., & Gorr, P. (2009). When ageing and disasters collide: lessons from 16 international case studies. *Radiation protection dosimetry*, 134(3-4), 202-206.

Preshoff, K. (2014). Population pyramids: Powerful predictors of the future. Retrieved from <https://ed.ted.com/lessons/population-pyramids-powerful-predictors-of-the-future-kim-preshoff>

Qureshi, K., Gershon, R. R., Sherman, M. F., Straub, T., Gebbie, E., McCollum, M., ... & Morse, S. S. (2005). Health care workers' ability and willingness to report to duty during catastrophic disasters. *Journal of urban health*, 82(3), 378-388.

Robert Wood Johnson (RWJ) University Hospital Website. Medical Coordination Center. Access on January 4, 2018. <http://www.rwjuh.edu/rwjuh/medical-coordination-center.aspx>

Root, E. D., Amoozegar, J. B., & Bernard, S. L. (2007). *Nursing homes in public health emergencies: special needs and potential roles*. Agency for Healthcare Research and Quality, US Department of Health and Human Services.

Rutgers Internal Review Board (IRB) Website. Review Categories. Accessed on November 15, 2015. <https://orra.rutgers.edu/review-categories>

Santos, J. R., Herrera, L. C., Yu, K. D. S., Pagsuyoin, S. A. T., & Tan, R. R. (2014). State of the art in risk analysis of workforce criticality influencing disaster preparedness for interdependent systems. *Risk analysis*, 34(6), 1056-1068.

Sadiq, A. A., & Graham, J. D. (2015). Exploring the predictors of organizational preparedness for natural disasters. *Risk analysis*.

Schwab, A. K., Sandler, D., & Brower, D. J. (2016). *Hazard Mitigation and Preparedness: An Introductory Text for Emergency Management and Planning Professionals*. CRC Press.

Sengupta M, Valverde R, Lendon JP, Rome V, Caffrey C, Harris-Kojetin L. (2016) Long-Term Care Providers and Services Users in the United States—State Estimates Supplement: National Study of Long-Term Care Providers, 2013–2014. Hyattsville, MD: National Center for Health Statistics.

Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280-285.

Standards for Licensure of Long-term Care Facilities, N.J.A.C. 8:39, 2007.

State Regulations Pertaining to Disaster/Emergency Preparedness. (2011). University of Minnesota,
http://www.hpm.umn.edu/nhregsplus/NH%20Regs%20by%20Topic/NH%20Regs%20Topic%20Pdfs/Disaster%20Preparedness/category_administration_disaster_emergency_preparedness.pdf.

United States Census Bureau, Population Division. (2016) Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties and Puerto Rico Commonwealth and Municipios: April 1, 2010 to July 1, 2015. Accessed on October 19, 2017 <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

Uitto, J. I. (1998). The geography of disaster vulnerability in megacities: a theoretical framework. *Applied geography*, 18(1), 7-16.

Wood, M. D., Bostrom, A., Bridges, T., & Linkov, I. (2012). Cognitive mapping tools: review and risk management needs. *Risk Analysis*, 32(8), 1333-1348.

APPENDIX A

Survey to be distributed in January of 2017 (mail push to web method)

1. Pre-Notification Contact Mailing

RUTGERS UNIVERSITY LOGO & LETTERHEAD

DATE

Facility Manager's Name (if available)

Senior Facility Address

City, State Zipcode

Dear _____,

In the next few days, researchers from the Bloustein School of Planning and Public Policy at Rutgers University will contact you to request your participation in a study to better understand preparedness of facilities that host senior citizens in New Jersey to respond to natural hazard events. We are reaching out prior to the release of the questionnaire because we have found that people like to know when and why they will be contacted.

We have spoken with BLANK and BLANK organizations who are fully supportive of this research. We have included letters of support from these organizations that show they are aware of this research and agree with its level of importance.

We hope that you will participate in this study. If you have any questions or concerns, please do not hesitate to contact me at 848-932-2723 or at jrovito@ejb.rutgers.edu.

Sincerely,

--

Jennifer Whytlaw

Study Director

Rutgers University

2. “Push-to-Web” Contact Mailing

Draft Letter to Facility Managers¹⁹

RUTGERS UNIVERSITY LOGO & LETTERHEAD

DATE

Facility Manager’s Name (if available)

Senior Facility Address

City, State Zipcode

Dear _____,

Within the past decade, New Jersey has been involved in 17 federally declared environmental disaster events by the Federal Emergency Management Agency. Of those 17, three have been major tropical-induced events that made direct or indirect landfall in the State. The most recent extra-tropical system (i.e. Superstorm Sandy) made direct landfall along the southern part of the New Jersey coast and caused more destruction than some municipalities had seen in all prior events combined.

I am writing to ask for your help in improving our understanding of preparedness of those that house seniors to respond to natural disaster events.

The brief questionnaire should take approximately 15 minutes to complete.

If you have any questions about this study please contact Jennifer Whytlaw by telephone at 848-932-2723 or by email at jrovito@ejb.rutgers.edu.

Thank you in advance,

--

Jennifer Whytlaw
Study Director
Rutgers University

¹⁹ Adapted from Dillman et al., page 374.

3. Questionnaire Design

Website Welcome Page:²⁰

RUTGERS LOGO

Welcome!

This study will help improve our understanding of senior facilities preparedness to respond to natural disaster events. Your participation is voluntary and your responses will be kept confidential. My advisor and I will be the only people who will have access to the information that is being collected from this study.

If you have any questions about the study please contact Jennifer Whytlaw, the study director, by email at jrovito@ejb.rutgers.edu or by phone at (848) 932 – 2723.

Jennifer Whytlaw
Study Director

Survey Questions:

1. How would you categorize your current position? (Check all that apply)
 - a. Facility Manager
 - b. Facility Owner
 - c. Administrator
 - d. Director of Operations
 - e. Vice President of Operations
 - f. Other (please describe)
2. How long have you been in your current position?
 - a. Less than 6 months
 - b. 6 months to 1 year
 - c. 2 years to 4 years
 - d. 5 years to 9 years
 - e. 10 years or more
3. How would you describe the ownership of your facility?
 - a. State Government
 - b. County Government
 - c. Municipal/City Government
 - d. Public/Private Partnership
 - e. Non-profit
 - f. For-profit
 - g. Don't Know

²⁰ Adapted from Dillman et al., page 316.

PLANNING & COORDINATION MODULE

4. An emergency plan includes plans and procedures to be followed in case of medical emergencies, power failures, fire, or natural disasters. Does your facility have an emergency plan?
- a. Yes
 - b. No

(If Yes, proceed to Question 5; if No, proceed to Question 18)

5. Examples of natural hazard events include hurricanes, tornados, tropical storms, blizzards, and wildfires. Does your facility's emergency plan contain a section that addresses natural hazard events?
- a. Yes
 - b. No
 - c. Don't Know

(If Yes, proceed to Question 6; if No, proceed to Question 18)

6. Does the emergency plan address response to hurricanes and tropical storms?
- a. Yes
 - b. No
 - c. Don't Know

7. Does the emergency plan address response to blizzards?
- a. Yes
 - b. No
 - c. Don't Know

8. Does the emergency plan address response to wildfires or forest fires?
- a. Yes
 - b. No
 - c. Don't Know

9. "Sheltering-in-place" is remaining at a current location through the duration of an event. Does your emergency plan outline steps needed to shelter-in-place in response to a natural hazard event?
- a. Yes
 - b. No
 - c. Don't Know

10. Does your emergency plan outline steps needed for temporary relocation to an alternative facility or to an off-site location in response to a natural hazard event?
- a. Yes
 - b. No
 - c. Don't Know
11. Does your emergency plan outline steps of how to evacuate residents to an alternate location?
- a. Yes
 - b. No
12. When was the last time your emergency plan was updated?
- a. Within the last 6 months
 - b. Less than 1 year
 - c. Within the last 2 years
 - d. More than 2 years
13. Is a copy of your facility's emergency plan provided to municipal or county emergency managers?
- a. Yes
 - b. No
 - c. Don't Know
14. Has your facility ever had to evacuate?
- a. Yes
 - b. No
 - c. Don't Know

(If Yes, proceed to question 15. If No, survey will skip to Question 16)

15. What were the circumstances of the evacuation? Check all that apply.
- a. Fire (smoke alarms triggered)
 - b. Wildfire/Forest fire
 - c. Safety Drill
 - d. Hurricane/Tropical Storm
 - e. Electrical Malfunction
 - f. Snowstorm/Blizzard
 - g. Other (please describe)

--

TRAINING & EXERCISE

16. Are staff trained on emergency plan procedures?

- a. Yes
- b. No
- c. Don't Know

(If Yes, proceed to Question 17; if No, proceed to Question 18)

17. Does your facility conduct trainings and/or exercises on your emergency plans?

- a. Yes
- b. No
- c. Don't Know

18. How many times a year does your facility participate in emergency trainings and/or exercises?

17 [Fill-in Box; Number Only]

RESOURCE MODULE

19. Essential personnel are defined as staff that have assigned duties during an emergency event to ensure the safety of residents at a facility. How many full-time or part-time staff members are recognized by the facility as "essential personnel" requiring them to report to the facility leading up to or in response to an emergency event?

- a. [Fill-in Box; Number Only]

(Question 19 only asked if respondent provided a response of Yes to Question 14)

20. Does your facility have transportation available for all residents should an evacuation need to take place?

- a. Yes
- b. No

21. Does your facility rely on local emergency services such as the fire department or emergency medical services (EMS) to support an evacuation of your facility?

- a. Yes
- b. No
- c. Don't Know

22. Does your facility have contracts or agreements in place with resource providers to support sheltering-in-place?

- a. Yes
- b. No
- c. Don't Know

23. Does your facility have contracts or agreements in place with transportation providers to support an evacuation?

- a. Yes
- b. No
- c. Don't Know

24. Would you be willing to be contacted with further questions related to the subject of your facility?

- a. Yes
- b. No

(If No, proceed to Thank you and submittal, if Yes additional questions 24 and 25 will appear on same screen but won't be numbered)

What is your preferred method to contact you?

- a. Email address
- b. Phone number
- c. Mailing Address

What is your preferred time of day to be contacted?

- a. Morning
- b. Afternoon
- c. Evening

Closing page after the respondent clicks on the Submit button:

Your answers have been submitted. Thank you for taking the time to complete this survey. If you have indicated you are willing to be contacted further we will be following up with you soon.

We will provide everyone who participates in this study access to the final report produced from our analysis.

Thanks again!

Protocols

Interview Guide for Facility Managers

Introduction

Good Morning/Afternoon/Evening. Thank you for taking the time to speak with me today. The purpose of today's discussion is to understand the preparedness and capabilities of your facility in the event of a natural disaster (e.g. hurricanes).

I will ask you a series of questions about your position and overall planning for emergencies. It is important to note that there isn't any right or wrong answers. To make sure I remember your answer, I will be recording as well as jotting down some notes.

Go over consent again and re-confirm the interviewee doesn't have any concerns or questions

Before we get started, do you have any questions about the process?

Introduction Questions

1. How long have you been in your current position?
2. What role does the facility owner play in your current workflow?
3. Does the owner of the facility own other similar facilities?
4. Is your facility associated with any other facilities?
5. What type of transportation is available to residents of this facility?
6. How do you share information with residents and their families?

Organizational Management

1. How many total staff members work at the facility?
2. How many of those are full-time?
3. How many are part time?
4. Do you have employee roles that are considered essential personal?
5. What positions do these employees usually hold?
6. Are there protocols in place to contact them during a time of emergency?

Planning and Support

1. Does your facility have an emergency plan?
2. Do you know of whether the plan includes information for natural disasters?
3. Has your facility ever been evacuated?
 - a. *If yes*, what were the conditions that contributed to an evacuation taking place?
 - b. *If no*, whom made the final decision not to evacuate?
4. Do you receive planning support from any other agency – such as a local health department or your local emergency manager?
5. Are you aware of your facility having a continuity of operations plan? *Have definition of COOP ready in case the interviewee would like it defined.*
6. Are medical records stored on-site?
7. Do you have any information or supplies being stored off-site?

8. Do you have plans in place to get residents needed medications during an emergency?
9. Do you have long-term plans to obtain medical treatment/medications for residents for an extended emergency (e.g. power outage)?
10. What plans are in place to evacuate residents, if needed, during an emergency?
11. Do you have dedicated transportation available should you need to evacuate residents?
12. Are these plans coordinated with your Municipality or County?

Municipality

1. Are you aware of where the municipal emergency manager is located? (Are they the fire chief, or municipal politician?)
2. How often do you speak to your local emergency manager?
3. Have you ever attended any meetings where local emergency managers were present?
4. Have you attended any trainings hosted by the emergency response community?
5. How satisfied are you with the amount of communication between your facility and your local emergency responder community?

Closing Questions

1. Is there anything else that I haven't asked about that you would like to discuss?

Interview Guide for New Jersey Office of Emergency Management – Lt. Mario Sinatra

Introduction

Good Morning/Afternoon/Evening. Thank you for taking the time to speak with me today. The purpose of today's discussion is to understand the interactions and coordination between senior facilities in New Jersey and local emergency management.

I will ask you a series of questions about your position and overall understanding and working knowledge of senior facilities planning for emergencies. It is important to note that there isn't any right or wrong answers. To make sure I remember your answer, I will be recording as well as jotting down some notes.

Go over consent again and re-confirm the interviewee doesn't have any concerns or questions

Before we get started, do you have any questions about the process?

Introduction Questions

1. What is your current position at NJOEM?
2. How long have you been in that position?
3. What was your prior position and associated responsibilities?
4. Could you describe the type of interactions you have had with senior facilities while working with NJOEM?

Organization

1. In your opinion, how can support to senior facilities, specifically in the context of emergency and evacuation planning, be improved?
2. Have you noticed differences in resources or overall planning capabilities between senior facilities?
3. Do you know if the size of a facility has an impact on its resources?
4. In your opinion, are there any organizational limitations at senior facilities to prepare for or respond to a disaster?

Planning

1. What planning support does NJOEM provide to senior facilities?
2. Does this support differ when we talk about County or Municipal OEMs?
3. Do facilities provide municipal or county OEMs copies of their emergency plans?
4. Do you know of any facility that may have what you consider a good plan or has a plan with aspects you consider best practices?
5. In your opinion, what is the most difficult issue facility's face while developing emergency plans?
6. What aspects of a hazard plan should facilities be able to address with minimal support?
7. When a mandatory evacuation order is issued by the State, are residents legally obligated to comply with the order?
 - a. What about a county mandatory order?
 - b. What about a municipal mandatory order?
 - i. If yes for any, are private senior facilities expected to comply as well?

Coordination

1. Do you know if senior facilities coordinate with each other for emergency preparedness?
 - a. If so, how?
2. Do you know of any memorandums of understanding in place to improve facility preparedness and response effectiveness?
3. What roles do state, county and municipalities play in coordinating plans across senior facilities?

Closing Questions

1. How would you describe an effective facility plan?
 - a. What are the most critical aspects?
 - b. Can you recommend a good example to look to?
2. Could you recommend specific disasters or incidents to research which required decision making and/or a response by senior facilities?
3. Is there anything else that I haven't asked about that you would like to discuss?
4. Is there anyone else you think I should speak to about this subject?

Interview Guide for the New Jersey Department of Health

Introduction

Good Morning/Afternoon/Evening. Thank you for taking the time to speak with me today. The purpose of today's discussion is to understand the interactions and coordination between senior facilities in New Jersey and the State and local health departments.

I will ask you a series of questions about your position and overall understanding and working knowledge of senior facilities planning for emergencies. It is important to note that there isn't any right or wrong answers. To make sure I remember your answer, I will be recording as well as jotting down some notes.

Go over consent again and re-confirm the interviewee doesn't have any concerns or questions

Before we get started, do you have any questions about the process?

Introduction Questions

1. What was your official title when you worked at the NJ Department of Health (NJDOH)?
2. How long were you in that position?
3. Did you work with senior facilities on a regular basis?
4. Can you describe those interactions and who you worked with (i.e. position of staff)?

Planning

1. What role does NJDOH play in the development of facility emergency and evacuation plans?
2. Who do facility owners turn to for support? (e.g. Local health departments, State Dept. of Health, Emergency Managers, fire departments, or hospitals)?
3. How does NJDOH share information with facilities?
4. What resources can NJDOH provide during an emergency to support evacuations of senior facilities?
5. In your opinion, do facilities know of these resources?
6. How often will senior facilities ask for our access these resources?
7. What are some of the successes of NJDOH in supporting long term care facilities improve their preparedness?

Coordination

1. Can you describe the efforts NJDOH has undertaken in the southern counties prior to Irene and the progress made through that event, through Sandy and to today?
2. How many MOUs/MAA have been signed by facilities?
3. What counties are currently working to replicate the success of Salem County?
4. Are there any efforts to bring the process to the northern part of the state? What are the difficulties in achieving the success seen in Salem elsewhere?

5. What do you view as the most critical elements of facility planning that fail when a disaster occurs?
6. What are the most critical elements included in planning that make evacuation and emergency response by a facility a success?
7. Where can NJDOH improve?

Closing Questions

1. What are the reasons, in your opinion, that facilities will not evacuate?
2. Can you identify any event in which an evacuation did not occur at a senior facility in NJ but should have?
3. Is there anything else that I haven't asked about that you would like to discuss?
4. Is there anyone else you think I should speak to about this subject?

APPENDIX B

Table B.1. Does your facility have an emergency plan?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	44	
For Profit	50	
Missing	1	1
Total	103	(104)

Table B.2. Examples of natural hazard events include hurricanes, earthquakes, tropical storms, blizzards, and wildfires. Does your facility's emergency plan contain a section that addresses natural hazard events?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	42	2
For Profit	48	2
Missing	1	
Total	99	(103)

Table B.3. Does the emergency plan address hurricanes and tropical storms?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	2	1
Non-Profit	42	3
For Profit	43	7
Missing	1	
Total	93	(104)

Table B.4. Does the emergency plan address blizzards?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	42	3
For Profit	42	6
Missing	1	
Total	93	(102)

Table B.5. Does the emergency plan address wildfires or forest fires?

Facility Ownership	Yes	No
State Government	1	2
County Government		2
Public/Private Partnership	2	1
Non-Profit	14	30
For Profit	13	37
Missing		1
Total	30	(103)

Table B.6. Sheltering-in-place can be described as remaining in a current location through the duration of an event. Does your emergency plan outline steps needed to shelter-in-place in response to a natural hazard event?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	2	1
Non-Profit	38	6
For Profit	44	5
Missing	1	
Total	90	(102)

Table B.7. Does your emergency plan outline steps needed for temporary relocation to an alternative facility or to an off-site location in response to a natural hazard event?

Facility Ownership	Yes	No
State Government	3	
County Government	1	1
Public/Private Partnership	3	
Non-Profit	41	3
For Profit	45	5
Missing	1	
Total	94	9 (103)

Table B.8. Does your emergency plan outline steps of how to evacuate residents to an alternate location?

Facility Ownership	Yes	No
State Government	3	
County Government	1	1
Public/Private Partnership	2	1

Non-Profit	42	3
For Profit	42	6
Missing	1	
Total	91	11 (102)

Table B.9. When was the last time your emergency plan was updated?

Timeline	Count
Within the last 6 months	38
Less than 1 year	37
Within the last 2 years	16
More than 2 years	6
Total	97

Table B.10. Are the facility's emergency plans shared with municipal or county emergency managers?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	41	4
For Profit	38	12
Missing	1	
Total	88	16 (104)

Table B.11. Has your facility ever had to evacuate?

Facility Ownership	Yes	No
State Government	1	2
County Government		2
Public/Private Partnership		3
Non-Profit	7	38
For Profit	6	44
Missing		1
Total	14	90 (104)

Table B.12. What were the circumstances of the evacuation? Check all that apply.

Circumstance for the evacuation	Count
Fire (smoke alarms triggered)	5
Wildfire/Forest fire	2
Safety Drill	1
Hurricane/Tropical Storm	5
Electrical Malfunction	1
Snowstorm/Blizzard	0
Other (i.e. Boiler, Gas Explosion,	7

Attic Sprinkler, Gas Leak)	
Total	21

Table B.13. Are staff trained on emergency plan procedures?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	42	2
For Profit	45	5
Missing	1	
Total	96	7 (103)

Table B.14. Does your facility conduct trainings?

Facility Ownership	Yes	No
State Government	3	
County Government	2	
Public/Private Partnership	3	
Non-Profit	41	3
For Profit	45	5
Missing	1	
Total	95	8 (103)

Table B.15. How many times a year does your facility participate in emergency trainings and/or exercises?

Minimum	1
Maximum	49
Mean	5.77
Total Responses	92

Table B.16. Essential personnel are defined as staff that have assigned duties during an emergency event to ensure the safety of residents at a facility. How many full-time or part-time staff members are recognized by the facility as “essential personnel” requiring them to report to the facility leading up to or in response to an emergency event?

Minimum	2
Maximum	900
Mean	87
Total Responses	86

Table B.17. Does your facility have transportation immediately available for all residents should an evacuation need to take place?

Facility Ownership	Yes	No
--------------------	-----	----

State Government	1	1
County Government	1	1
Public/Private Partnership	3	
Non-Profit	29	13
For Profit	31	19
Missing	1	
Total	66	34 100)

Table B.18. Does your emergency plan rely on local resources and/or services such as through the fire department or emergency medical services to support an evacuation of your facility if necessary?

Facility Ownership	Yes	No
State Government	2	
County Government	2	
Public/Private Partnership	3	
Non-Profit	35	9
For Profit	39	11
Missing	1	
Total	82	20 (102)

Table B.19. Does your facility have contracts or agreements in place with resource providers to support sheltering-in-place?

Facility Ownership	Yes	No
State Government	2	
County Government	1	1
Public/Private Partnership	2	1
Non-Profit	43	1
For Profit	42	8
Missing	1	
Total	91	11 (102)

Table B.20. Does your facility have contracts or agreements in place with transportation providers to support an evacuation?

Facility Ownership	Yes	No
State Government	2	
County Government	1	1
Public/Private Partnership	3	
Non-Profit	39	5
For Profit	39	11
Missing	1	
Total	85	18 102)

Table B.21. Are you aware of the new CMS Rule?

Facility Ownership	Yes	No
State Government	2	
County Government	2	
Public/Private Partnership	2	1
Non-Profit	34	9
For Profit	33	17
Missing	1	
Total	74	27 (101)

SPSS Output

Crosstabs

Notes

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Warnings

No measures of association are computed for the crosstabulation of RevisedOwnership * EPRecode. At least one variable in each 2-way table upon which measures of association are computed is a constant.

Case Processing Summary

	Cases					
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RevisedOwnership * EPRecode	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * EPNatural	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * EPTropical	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * EPBlizzards	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * EPFire	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * Shelter	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * RelocationPlan	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * EPEvacPlan	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * EPProvidedEMS	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * EPRecode

Crosstab

Count

		EPRecode	
		1.00	Total
RevisedOwnership	1.00	9	9
	2.00	44	44
	3.00	46	46
Total		99	99

Chi-Square Tests

	Value
Pearson Chi-Square	. ^a
N of Valid Cases	99

a. No statistics are computed
because EPRecode is a constant.

Symmetric Measures

	Value
Nominal by Nominal Phi	. ^a
N of Valid Cases	99

a. No statistics are computed because
EPRecode is a constant.

RevisedOwnership * EPNatural

Crosstab

Count

		EPNatural		Total
		.00	1.00	
RevisedOwnership	1.00	0	9	9
	2.00	2	42	44
	3.00	1	45	46
Total		3	96	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.740 ^a	2	.691
Likelihood Ratio	.980	2	.613
Linear-by-Linear Association	.012	1	.913
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .27.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.086		
	Cramer's V	.086		
Interval by Interval	Pearson's R	.011	.075	.109
Ordinal by Ordinal	Spearman Correlation	.024	.084	.237
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.691

	Cramer's V	.691
Interval by Interval	Pearson's R	.913 ^c
Ordinal by Ordinal	Spearman Correlation	.813 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * EPTropical

Crosstab

Count

		EPTropical		
		.00	1.00	Total
RevisedOwnership	1.00	1	8	9
	2.00	2	42	44
	3.00	3	43	46
Total		6	93	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.598 ^a	2	.742
Likelihood Ratio	.538	2	.764
Linear-by-Linear Association	.025	1	.875

N of Valid Cases	99		
------------------	----	--	--

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .55.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.078		
	Cramer's V	.078		
Interval by Interval	Pearson's R	.016	.115	.157
Ordinal by Ordinal	Spearman Correlation	.004	.110	.040
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.742
	Cramer's V	.742
Interval by Interval	Pearson's R	.876 ^c
Ordinal by Ordinal	Spearman Correlation	.968 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * EPBlizzards

Crosstab

Count

		EPBlizzards		
		.00	1.00	Total
RevisedOwnership	1.00	0	9	9
	2.00	2	42	44
	3.00	4	42	46
Total		6	93	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	1.319 ^a	2	.517
Likelihood Ratio	1.817	2	.403
Linear-by-Linear Association	1.305	1	.253
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .55.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.115		

	Cramer's V	.115		
Interval by Interval	Pearson's R	-.115	.077	-1.144
Ordinal by Ordinal	Spearman Correlation	-.113	.086	-1.125
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.517
	Cramer's V	.517
Interval by Interval	Pearson's R	.255 ^c
Ordinal by Ordinal	Spearman Correlation	.263 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * EPFire

Crosstab

Count

		EPFire		
		.00	1.00	Total
RevisedOwnership	1.00	6	3	9
	2.00	30	14	44

	3.00	33	13	46
Total		69	30	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.178 ^a	2	.915
Likelihood Ratio	.178	2	.915
Linear-by-Linear Association	.167	1	.683
N of Valid Cases	99		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.73.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.042		
	Cramer's V	.042		
Interval by Interval	Pearson's R	-.041	.101	-.407
Ordinal by Ordinal	Spearman Correlation	-.042	.101	-.417
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.915
	Cramer's V	.915
Interval by Interval	Pearson's R	.685 ^c
Ordinal by Ordinal	Spearman Correlation	.678 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

RevisedOwnership * Shelter

Crosstab

Count

		Shelter		
		.00	1.00	Total
RevisedOwnership	1.00	1	8	9
	2.00	6	38	44
	3.00	2	44	46
Total		9	90	99

Chi-Square Tests

Value	df	Asymptotic Significance (2- sided)
-------	----	--

Pearson Chi-Square	2.397 ^a	2	.302
Likelihood Ratio	2.534	2	.282
Linear-by-Linear Association	1.625	1	.202
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .82.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.156		
	Cramer's V	.156		
Interval by Interval	Pearson's R	.129	.092	1.279
Ordinal by Ordinal	Spearman Correlation	.141	.089	1.399
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.302
	Cramer's V	.302
Interval by Interval	Pearson's R	.204 ^c
Ordinal by Ordinal	Spearman Correlation	.165 ^c

N of Valid Cases	
------------------	--

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * RelocationPlan

Crosstab

Count

		RelocationPlan		
		.00	1.00	Total
RevisedOwnership	1.00	1	8	9
	2.00	3	41	44
	3.00	1	45	46
Total		5	94	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	1.770 ^a	2	.413
Likelihood Ratio	1.781	2	.410
Linear-by-Linear Association	1.751	1	.186
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .45.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.134		
	Cramer's V	.134		
Interval by Interval	Pearson's R	.134	.102	1.328
Ordinal by Ordinal	Spearman Correlation	.133	.094	1.318
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.413
	Cramer's V	.413
Interval by Interval	Pearson's R	.187 ^c
Ordinal by Ordinal	Spearman Correlation	.191 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

RevisedOwnership * EPEvacPlan

Crosstab

Count

		EPEvacPlan		
		.00	1.00	Total
RevisedOwnership	1.00	2	7	9
	2.00	2	42	44
	3.00	4	42	46
Total		8	91	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	3.187 ^a	2	.203
Likelihood Ratio	2.599	2	.273
Linear-by-Linear Association	.317	1	.573
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .73.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.179		
	Cramer's V	.179		
Interval by Interval	Pearson's R	.057	.126	.561
Ordinal by Ordinal	Spearman Correlation	.030	.118	.298

N of Valid Cases	99		
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Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.203
	Cramer's V	.203
Interval by Interval	Pearson's R	.576 ^c
Ordinal by Ordinal	Spearman Correlation	.766 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * EPProvidedEMS

Crosstab

Count

		EPProvidedEMS		Total
		.00	1.00	
RevisedOwnership	1.00	0	9	9
	2.00	3	41	44
	3.00	8	38	46
Total		11	88	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	3.783 ^a	2	.151
Likelihood Ratio	4.657	2	.097
Linear-by-Linear Association	3.682	1	.055
N of Valid Cases	99		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.00.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.195		
	Cramer's V	.195		
Interval by Interval	Pearson's R	-.194	.075	-1.946
Ordinal by Ordinal	Spearman Correlation	-.195	.084	-1.963
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.151
	Cramer's V	.151
Interval by Interval	Pearson's R	.055 ^c
Ordinal by Ordinal	Spearman Correlation	.053 ^c

N of Valid Cases

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

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Crosstabs

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Case Processing Summary

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RevisedOwnership * services3 Crosstabulation

Count

		services3					
		1.00	2.00	4.00	5.00	6.00	7.00
RevisedOwnership	1.00	0	0	1	1	4	3
	2.00	1	1	0	4	26	12
	3.00	1	0	2	2	28	13
Total		2	1	3	7	58	28

RevisedOwnership * services3 Crosstabulation

Count

		Total
RevisedOwnership	1.00	9
	2.00	44
	3.00	46
Total		99

Chi-Square Tests

Value	df	Asymptotic Significance (2- sided)
-------	----	--

Pearson Chi-Square	6.379 ^a	10	.783
Likelihood Ratio	7.487	10	.679
Linear-by-Linear Association	.056	1	.813
N of Valid Cases	99		

a. 13 cells (72.2%) have expected count less than 5. The minimum expected count is .09.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.254		
	Cramer's V	.179		
Interval by Interval	Pearson's R	.024	.095	.235
Ordinal by Ordinal	Spearman Correlation	.027	.104	.263
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.783
	Cramer's V	.783
Interval by Interval	Pearson's R	.815 ^c
Ordinal by Ordinal	Spearman Correlation	.793 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

DATASET ACTIVATE DataSet1.

```
SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.
```

```
compute emerplan3=e1+e2+e3+e4+e5+e6+e7+e8+e9.
```

DATASET ACTIVATE DataSet1.

```
SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.
```

CROSSTABS

```
/TABLES=Ownership BY emerplan3
```

```
/FORMAT=AVALUE TABLES
```

```
/STATISTICS=CHISQ PHI CORR
```

```
/CELLS=COUNT
```

```
/COUNT ROUND CELL.
```

Crosstabs

Notes

Output Created		13-AUG-2017 16:10:58
Comments		
Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1
	Filter	<none>
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	Split File	<none>
	N of Rows in Working Data	99
	File	

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=Ownership BY emerplan3 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI CORR /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * emerplan3	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * emerplan3 Crosstabulation

Count

		emerplan3					
		1.00	3.00	5.00	6.00	7.00	8.00
RevisedOwnership	1.00	0	0	1	1	0	4
	2.00	1	1	0	0	6	24
	3.00	1	0	1	2	7	24
Total		2	1	2	3	13	52

RevisedOwnership * emerplan3 Crosstabulation

Count

		emerplan3	
		9.00	Total
RevisedOwnership	1.00	3	9
	2.00	12	44
	3.00	11	46
Total		26	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	11.338 ^a	12	.500
Likelihood Ratio	12.547	12	.403
Linear-by-Linear Association	.020	1	.886

N of Valid Cases	99		
------------------	----	--	--

a. 15 cells (71.4%) have expected count less than 5. The minimum expected count is .09.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.338		
	Cramer's V	.239		
Interval by Interval	Pearson's R	-.014	.098	-.142
Ordinal by Ordinal	Spearman Correlation	-.061	.104	-.600
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.500
	Cramer's V	.500
Interval by Interval	Pearson's R	.887 ^c
Ordinal by Ordinal	Spearman Correlation	.550 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

compute emerplan5=e7+e8+e9.

DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.

CROSSTABS

/TABLES=Ownership BY emerplan5
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ PHI CORR
/CELLS=COUNT
/COUNT ROUND CELL.

Crosstabs

Notes

Output Created		13-AUG-2017 16:13:29
Comments		
Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.

Syntax		CROSSTABS /TABLES=Ownership BY emerplan5 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI CORR /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * emerplan5	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * emerplan5 Crosstabulation

Count

emerplan5				
.00	1.00	2.00	3.00	Total

RevisedOwnership	1.00	0	1	1	7	9
	2.00	1	1	3	39	44
	3.00	1	1	8	36	46
Total		2	3	12	82	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	4.740 ^a	6	.578
Likelihood Ratio	4.213	6	.648
Linear-by-Linear Association	.070	1	.792
N of Valid Cases	99		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .18.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.219		
	Cramer's V	.155		
Interval by Interval	Pearson's R	-.027	.106	-.263
Ordinal by Ordinal	Spearman Correlation	-.077	.106	-.761
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.578
	Cramer's V	.578
Interval by Interval	Pearson's R	.793 ^c
Ordinal by Ordinal	Spearman Correlation	.448 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

CROSSTABS

```

/TABLES=Ownership BY s1 s2 s3 s4 s5 s6 s7
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ PHI CORR
/CELLS=COUNT
/COUNT ROUND CELL.

```

Crosstabs

Notes

Output Created		13-AUG-2017 16:22:48
Comments		
Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1

	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=Ownership BY s1 s2 s3 s4 s5 s6 s7 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI CORR /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * StaffTrained	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * FacilityTrain	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * TransportAvail	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * RelyonEMS	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * ContractSupportSIP	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * ContractSupportTransport	99	100.0%	0	0.0%	99	100.0%
RevisedOwnership * FederalRegister	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * StaffTrained

Crosstab

Count

		StaffTrained		Total
		.00	1.00	
RevisedOwnership	1.00	0	9	9
	2.00	2	42	44

	3.00	1	45	46
Total		3	96	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.740 ^a	2	.691
Likelihood Ratio	.980	2	.613
Linear-by-Linear Association	.012	1	.913
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .27.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.086		
	Cramer's V	.086		
Interval by Interval	Pearson's R	.011	.075	.109
Ordinal by Ordinal	Spearman Correlation	.024	.084	.237
N of Valid Cases		99		

Symmetric Measures

Approximate Significance

Nominal by Nominal	Phi	.691
	Cramer's V	.691
Interval by Interval	Pearson's R	.913 ^c
Ordinal by Ordinal	Spearman Correlation	.813 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * FacilityTrain

Crosstab

Count

		FacilityTrain		Total
		.00	1.00	
RevisedOwnership	1.00	0	9	9
	2.00	3	41	44
	3.00	1	45	46
Total		4	95	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	1.668 ^a	2	.434
Likelihood Ratio	1.967	2	.374
Linear-by-Linear Association	.152	1	.697
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .36.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.130		
	Cramer's V	.130		
Interval by Interval	Pearson's R	.039	.070	.388
Ordinal by Ordinal	Spearman Correlation	.058	.079	.570
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.434
	Cramer's V	.434
Interval by Interval	Pearson's R	.699 ^c
Ordinal by Ordinal	Spearman Correlation	.570 ^c

N of Valid Cases	
------------------	--

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * TransportAvail

Crosstab

Count

		TransportAvail		
		.00	1.00	Total
RevisedOwnership	1.00	3	6	9
	2.00	15	29	44
	3.00	15	31	46
Total		33	66	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.022 ^a	2	.989
Likelihood Ratio	.022	2	.989
Linear-by-Linear Association	.012	1	.913

N of Valid Cases	99		
------------------	----	--	--

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.00.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.015		
	Cramer's V	.015		
Interval by Interval	Pearson's R	.011	.100	.109
Ordinal by Ordinal	Spearman Correlation	.012	.100	.123
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.989
	Cramer's V	.989
Interval by Interval	Pearson's R	.913 ^c
Ordinal by Ordinal	Spearman Correlation	.902 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

RevisedOwnership * RelyonEMS

Crosstab

Count

		RelyonEMS		
		.00	1.00	Total
RevisedOwnership	1.00	1	8	9
	2.00	9	35	44
	3.00	7	39	46
Total		17	82	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.689 ^a	2	.708
Likelihood Ratio	.705	2	.703
Linear-by-Linear Association	.021	1	.884
N of Valid Cases	99		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.55.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.083		

	Cramer's V	.083		
Interval by Interval	Pearson's R	.015	.094	.145
Ordinal by Ordinal	Spearman Correlation	.027	.096	.267
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.708
	Cramer's V	.708
Interval by Interval	Pearson's R	.885 ^c
Ordinal by Ordinal	Spearman Correlation	.790 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * ContractSupportSIP

Crosstab

Count

		ContractSupportSIP		
		.00	1.00	Total
RevisedOwnership	1.00	3	6	9
	2.00	1	43	44
	3.00	4	42	46

Total	8	91	99
-------	---	----	----

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	9.748 ^a	2	.008
Likelihood Ratio	7.403	2	.025
Linear-by-Linear Association	1.282	1	.258
N of Valid Cases	99		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .73.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.314		
	Cramer's V	.314		
Interval by Interval	Pearson's R	.114	.140	1.134
Ordinal by Ordinal	Spearman Correlation	.068	.129	.675
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.008

	Cramer's V	.008
Interval by Interval	Pearson's R	.260 ^c
Ordinal by Ordinal	Spearman Correlation	.501 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

RevisedOwnership * ContractSupportTransport

Crosstab

Count

		ContractSupportTransport		
		.00	1.00	Total
RevisedOwnership	1.00	3	6	9
	2.00	5	39	44
	3.00	7	39	46
Total		15	84	99

Chi-Square Tests

Value	df	Asymptotic Significance (2- sided)
-------	----	--

Pearson Chi-Square	2.806 ^a	2	.246
Likelihood Ratio	2.367	2	.306
Linear-by-Linear Association	.482	1	.487
N of Valid Cases	99		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.36.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.168		
	Cramer's V	.168		
Interval by Interval	Pearson's R	.070	.116	.693
Ordinal by Ordinal	Spearman Correlation	.046	.111	.453
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.246
	Cramer's V	.246
Interval by Interval	Pearson's R	.490 ^c
Ordinal by Ordinal	Spearman Correlation	.651 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

RevisedOwnership * FederalRegister

Crosstab

Count

		FederalRegister		
		.00	1.00	Total
RevisedOwnership	1.00	2	7	9
	2.00	10	34	44
	3.00	13	33	46
Total		25	74	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.413 ^a	2	.813
Likelihood Ratio	.412	2	.814
Linear-by-Linear Association	.350	1	.554
N of Valid Cases	99		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.27.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.065		
	Cramer's V	.065		
Interval by Interval	Pearson's R	-.060	.100	-.589
Ordinal by Ordinal	Spearman Correlation	-.063	.100	-.620
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.813
	Cramer's V	.813
Interval by Interval	Pearson's R	.557 ^c
Ordinal by Ordinal	Spearman Correlation	.537 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

compute services3=s1+s2+s3+s4+s5+s6+s7.

DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
 'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
 /COMPRESSED.

CROSSTABS

/TABLES=Ownership BY services3

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ PHI CORR
 /CELLS=COUNT
 /COUNT ROUND CELL.

Crosstabs

Notes

Output Created		13-AUG-2017 16:26:55
Comments		
Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.

Syntax		CROSSTABS /TABLES=Ownership BY services3 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI CORR /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * services3	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * services3 Crosstabulation

Count

services3					
.00	2.00	4.00	5.00	6.00	7.00

RevisedOwnership	1.00	0	1	1	1	2	4
	2.00	1	0	1	7	21	14
	3.00	0	1	1	10	20	14
Total		1	2	3	18	43	32

RevisedOwnership * services3 Crosstabulation

Count

		Total
RevisedOwnership	1.00	9
	2.00	44
	3.00	46
Total		99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	10.235 ^a	10	.420
Likelihood Ratio	8.996	10	.532
Linear-by-Linear Association	.193	1	.660
N of Valid Cases	99		

a. 12 cells (66.7%) have expected count less than 5. The minimum expected count is .09.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.322		
	Cramer's V	.227		
Interval by Interval	Pearson's R	.044	.114	.438
Ordinal by Ordinal	Spearman Correlation	-.032	.107	-.311
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.420
	Cramer's V	.420
Interval by Interval	Pearson's R	.663 ^c
Ordinal by Ordinal	Spearman Correlation	.756 ^c
N of Valid Cases		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

```
compute services5=s5+s6+s7.
DATASET ACTIVATE DataSet1.
```

```
SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
```

```

/COMPRESSED.
CROSSTABS
/TABLES=Ownership BY services5
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ PHI CORR
/CELLS=COUNT
/COUNT ROUND CELL.

```

Crosstabs

Notes

Output Created		13-AUG-2017 16:29:35
Comments		
Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.

Syntax		CROSSTABS /TABLES=Ownership BY services5 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI CORR /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * services5	99	100.0%	0	0.0%	99	100.0%

RevisedOwnership * services5 Crosstabulation

Count

services5				
.00	1.00	2.00	3.00	Total

RevisedOwnership	1.00	1	2	1	5	9
	2.00	1	1	11	31	44
	3.00	1	4	13	28	46
Total		3	7	25	64	99

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	7.985 ^a	6	.239
Likelihood Ratio	6.835	6	.336
Linear-by-Linear Association	.158	1	.691
N of Valid Cases	99		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .27.

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b
Nominal by Nominal	Phi	.284		
	Cramer's V	.201		
Interval by Interval	Pearson's R	.040	.122	.396
Ordinal by Ordinal	Spearman Correlation	-.028	.108	-.272
N of Valid Cases		99		

Symmetric Measures

		Approximate Significance
Nominal by Nominal	Phi	.239
	Cramer's V	.239
Interval by Interval	Pearson's R	.693 ^c
Ordinal by Ordinal	Spearman Correlation	.786 ^c
N of Valid Cases		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

```

COMPUTE MeanEP=MEAN(emerplan5).
EXECUTE.
COMPUTE MeanEP=MEAN(emerplan3).
EXECUTE.
MEANS TABLES=Ownership BY emerplan3
/CELLS=MEAN COUNT STDDEV
/STATISTICS ANOVA.

```

Means

Notes

Output Created	13-AUG-2017 17:07:56
Comments	

Input	Data	C:\Users\Jen\Desktop\Dissertation\2. Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.
Syntax		MEANS TABLES=Ownership BY emerplan3 /CELLS=MEAN COUNT STDDEV /STATISTICS ANOVA.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
RevisedOwnership * emerplan3	99	100.0%	0	0.0%	99	100.0%

Report

RevisedOwnership

emerplan3	Mean	N	Std. Deviation
1.00	2.5000	2	.70711
3.00	2.0000	1	.
5.00	2.0000	2	1.41421
6.00	2.3333	3	1.15470
7.00	2.5385	13	.51887
8.00	2.3846	52	.63102
9.00	2.3077	26	.67937
Total	2.3737	99	.64817

ANOVA Table

		Sum of Squares	df	Mean Square
RevisedOwnership * emerplan3	Between Groups (Combined)	.928	6	.155
	Within Groups	40.244	92	.437

Total	41.172	98	
-------	--------	----	--

ANOVA Table

		F	Sig.
RevisedOwnership * emerplan3	Between Groups (Combined)	.354	.906
	Within Groups		
	Total		

Measures of Association

	Eta	Eta Squared
RevisedOwnership * emerplan3	.150	.023

```

COMPUTE MeanEP=MEAN(emerplan5).
EXECUTE.
COMPUTE MeanServ=MEAN(services5).
EXECUTE.
DATASET ACTIVATE DataSet1.
SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.
COMPUTE SDEmerPlan=SD(emerplan5,MeanEP).
EXECUTE.
DATASET ACTIVATE DataSet1.
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'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.
DATASET ACTIVATE DataSet1.
SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.
DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+
'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'
/COMPRESSED.

```

compute emerplanSD=SD(e7+e8+e9).

Error # 4314 in column 31. Text:)

Only one argument was supplied for a function which requires at least two.

Execution of this command stops.

compute emerplanSD=SD(e7,e8,e9).

DESCRIPTIVES VARIABLES=emerplan5 services5

/STATISTICS=MEAN STDDEV.

Descriptives

Notes

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Comments		
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.

Syntax		DESCRIPTIVES VARIABLES=emerplan5 services5 /STATISTICS=MEAN STDDEV.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Descriptive Statistics

	N	Mean	Std. Deviation
emerplan5	99	2.7576	.60762
services5	99	2.5152	.76082
Valid N (listwise)	99		

ONEWAY Ownership BY MeanEP

/POLYNOMIAL=1

/MISSING ANALYSIS.

Oneway

Notes

Output Created	13-AUG-2017 17:20:45
Comments	

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	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on cases with no missing data for any variable in the analysis.
Syntax		ONEWAY Ownership BY MeanEP /POLYNOMIAL=1 /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

ANOVA

RevisedOwnership

		Sum of Squares	df	Mean Square	F
Between Groups	(Combined)	1.011	3	.337	.797

	Linear Term	Unweighted	.004	1	.004	.010
		Weighted	.029	1	.029	.069
		Deviation	.982	2	.491	1.161
Within Groups			40.161	95	.423	
Total			41.172	98		

ANOVA

RevisedOwnership

				Sig.
Between Groups		(Combined)		.498
		Linear Term	Unweighted	.921
			Weighted	.793
			Deviation	.318
Within Groups				
Total				

DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Jen\Desktop\Dissertation\2. '+

'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'

/COMPRESSED.

ONEWAY Ownership BY MeanServ

/POLYNOMIAL=1

/MISSING ANALYSIS.

Oneway

Notes

Output Created		13-AUG-2017 17:21:27
Comments		
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on cases with no missing data for any variable in the analysis.
Syntax		ONEWAY Ownership BY MeanServ /POLYNOMIAL=1 /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

ANOVA

RevisedOwnership

			Sum of Squares	df	Mean Square	F
Between Groups	(Combined)		.769	3	.256	.603
	Linear Term	Unweighted	.487	1	.487	1.145
		Weighted	.066	1	.066	.156
		Deviation	.702	2	.351	.826
Within Groups			40.403	95	.425	
Total			41.172	98		

ANOVA

RevisedOwnership

			Sig.
Between Groups	(Combined)		.615
	Linear Term	Unweighted	.287
		Weighted	.694
		Deviation	.441
Within Groups			
Total			

COMPUTE SDEPServ=SD(MeanEP,MeanServ).

EXECUTE.

DATASET ACTIVATE DataSet1.

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'Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'

/COMPRESSED.

GET

FILE='C:\Users\Jen\Desktop\Dissertation\2.
Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

ONEWAY services BY Ownership

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS

/POSTHOC=DUNCAN ALPHA(0.05).

Oneway

Notes

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Comments		
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

Cases Used		Statistics for each analysis are based on cases with no missing data for any variable in the analysis.
Syntax		ONEWAY services BY Ownership /STATISTICS DESCRIPTIVES /MISSING ANALYSIS /POSTHOC=DUNCAN ALPHA(0.05).
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.05

[DataSet1] C:\Users\Jen\Desktop\Dissertation\2.
 Survey\Analysis\Revised\PreparednessSurvey_vAug1317.sav

Descriptives

services

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum
					Lower Bound	Upper Bound	
1.00	9	6.0000	1.00000	.33333	5.2313	6.7687	4.00
2.00	44	5.9773	1.15111	.17354	5.6273	6.3272	1.00
3.00	46	6.0435	1.03186	.15214	5.7371	6.3499	1.00
Total	99	6.0101	1.07376	.10792	5.7959	6.2243	1.00

Descriptives

services

Maximum

1.00	7.00
2.00	7.00
3.00	7.00
Total	7.00

ANOVA

services

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.100	2	.050	.042	.959
Within Groups	112.890	96	1.176		
Total	112.990	98			

Post Hoc Tests**Homogeneous Subsets**

services

Duncan^{a,b}

RevisedOwnership	N	Subset for alpha = 0.05 1
2.00	44	5.9773
1.00	9	6.0000
3.00	46	6.0435

Sig.		.860
------	--	------

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 19.283.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ONEWAY emergencyp BY Ownership

/STATISTICS DESCRIPTIVES

/MISSING ANALYSIS

/POSTHOC=DUNCAN ALPHA(0.05).

Oneway

Notes

Output Created		15-AUG-2017 10:27:40
Comments		
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	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File	99
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on cases with no missing data for any variable in the analysis.
Syntax		ONEWAY emergencyp BY Ownership /STATISTICS DESCRIPTIVES /MISSING ANALYSIS /POSTHOC=DUNCAN ALPHA(0.05).
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Descriptives

CombinationEP

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum
					Lower Bound	Upper Bound	
1.00	9	7.7778	1.39443	.46481	6.7059	8.8496	5.00
2.00	44	7.8636	1.45620	.21953	7.4209	8.3064	1.00
3.00	46	7.7826	1.34846	.19882	7.3822	8.1831	1.00
Total	99	7.8182	1.38773	.13947	7.5414	8.0950	1.00

Descriptives

CombinationEP

Maximum

1.00	9.00
2.00	9.00
3.00	9.00
Total	9.00

ANOVA

CombinationEP

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.164	2	.082	.042	.959
Within Groups	188.563	96	1.964		
Total	188.727	98			

Post Hoc Tests

Homogeneous Subsets

CombinationEP

Duncan^{a,b}

		Subset for alpha = 0.05
RevisedOwnership	N	1
1.00	9	7.7778

3.00	46	7.7826
2.00	44	7.8636
Sig.		.859

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 19.283.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

APPENDIX C

Figure C.1. Senior Facilities with all NFIP Payouts (1978-2017)

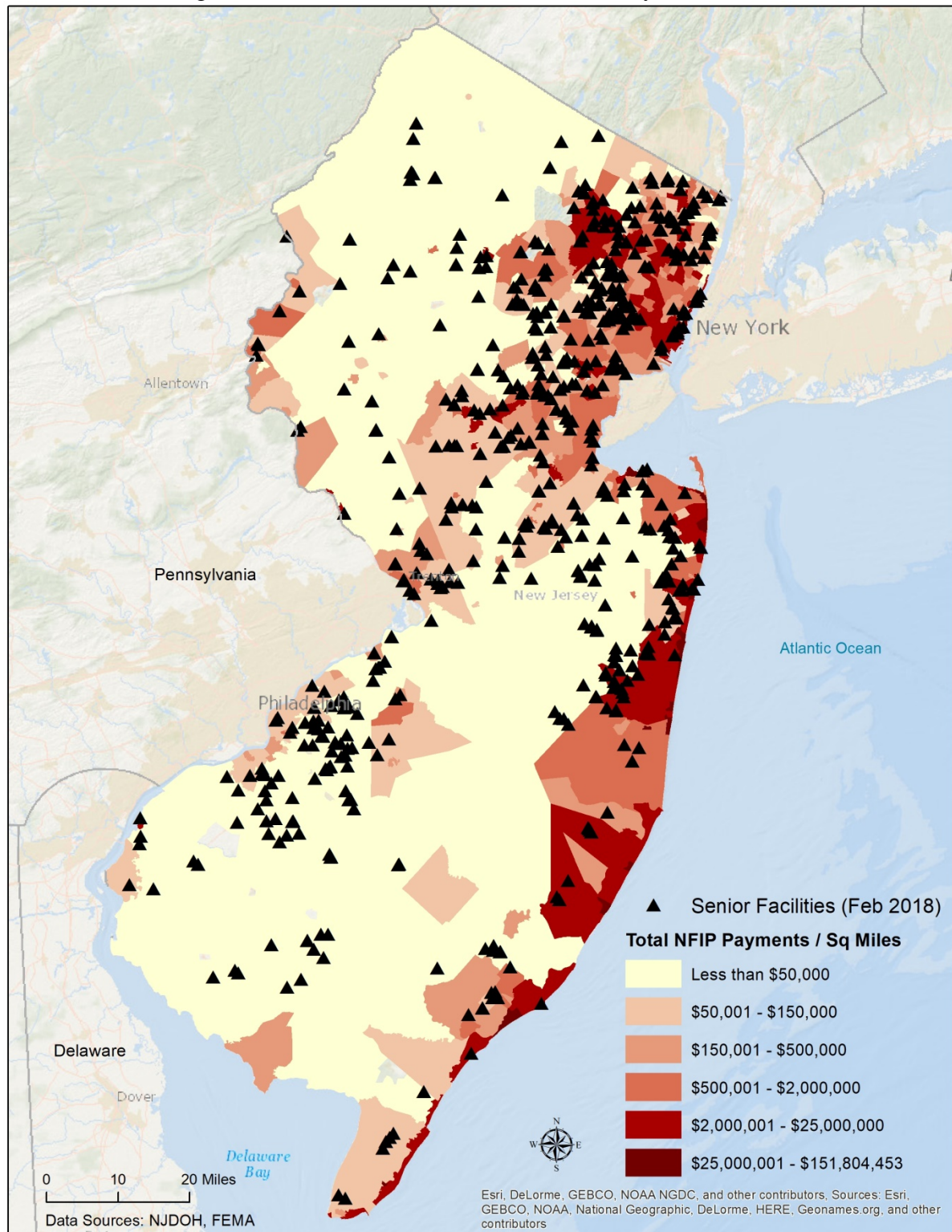


Figure C.2. Senior Facilities with Increased Wildfire Fuel Hazards (High to Extreme)

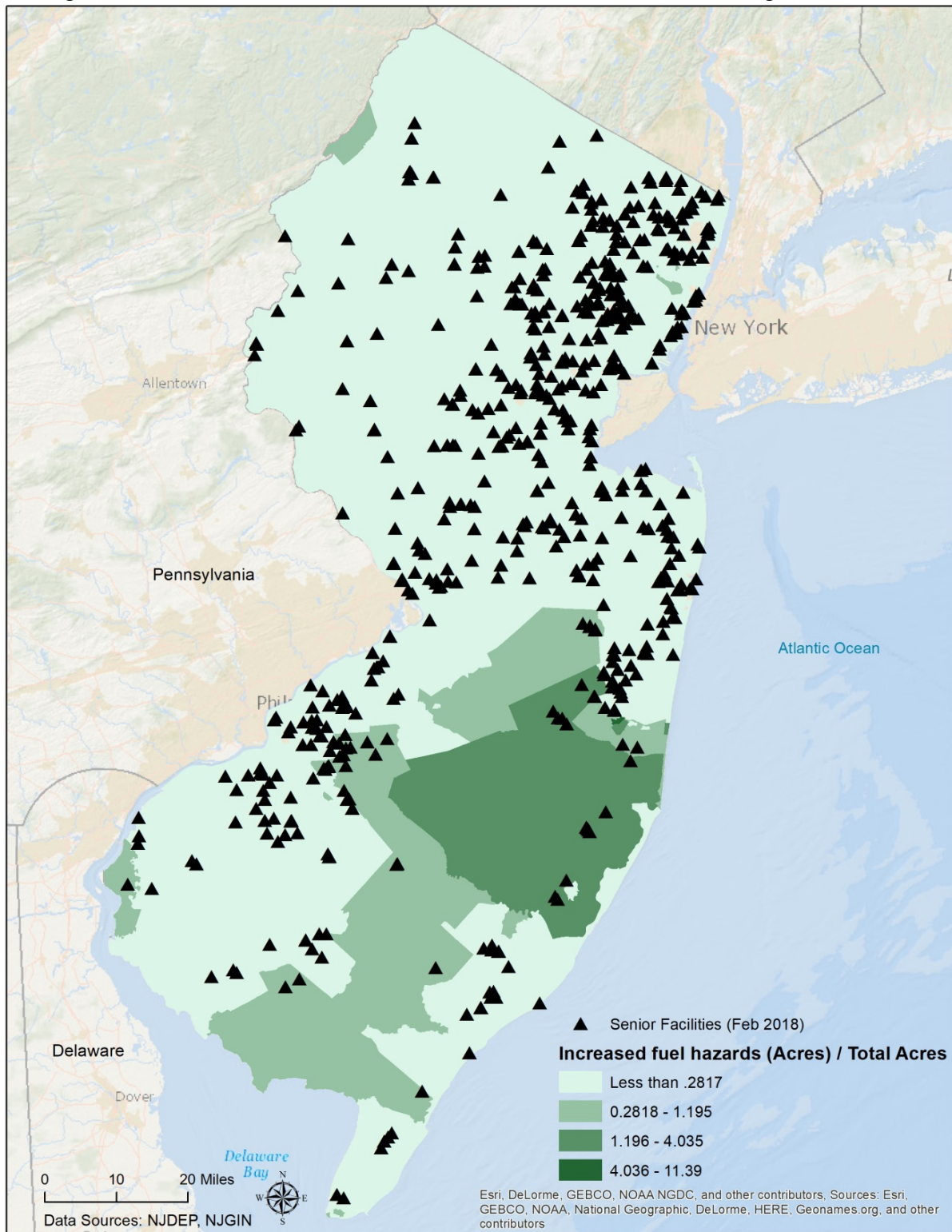


Figure C.3. Senior Facilities with Historic Wildfires (1924 to February 2018)

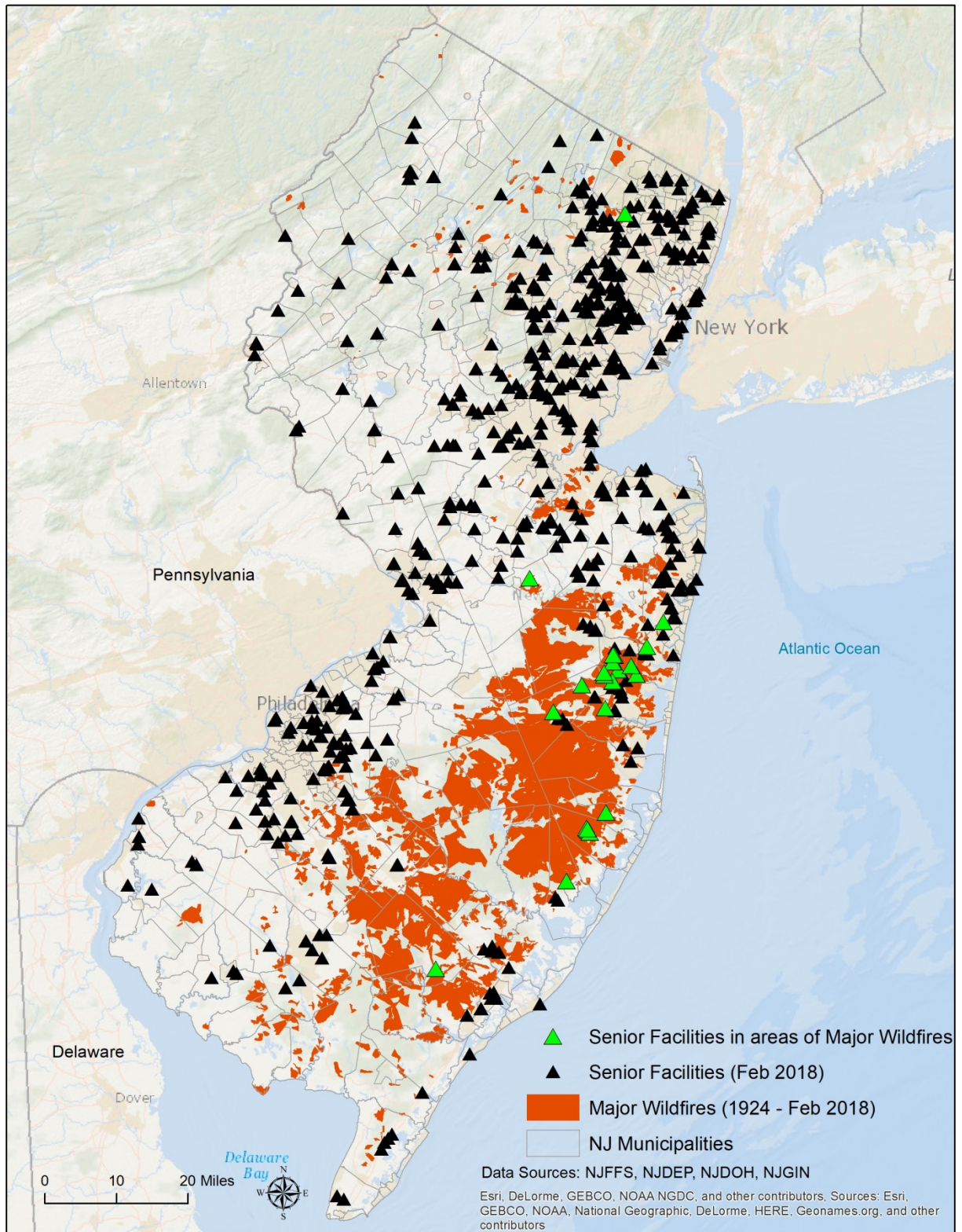


Figure C.4. Senior Facilities in Superstorm Sandy Surge Extent

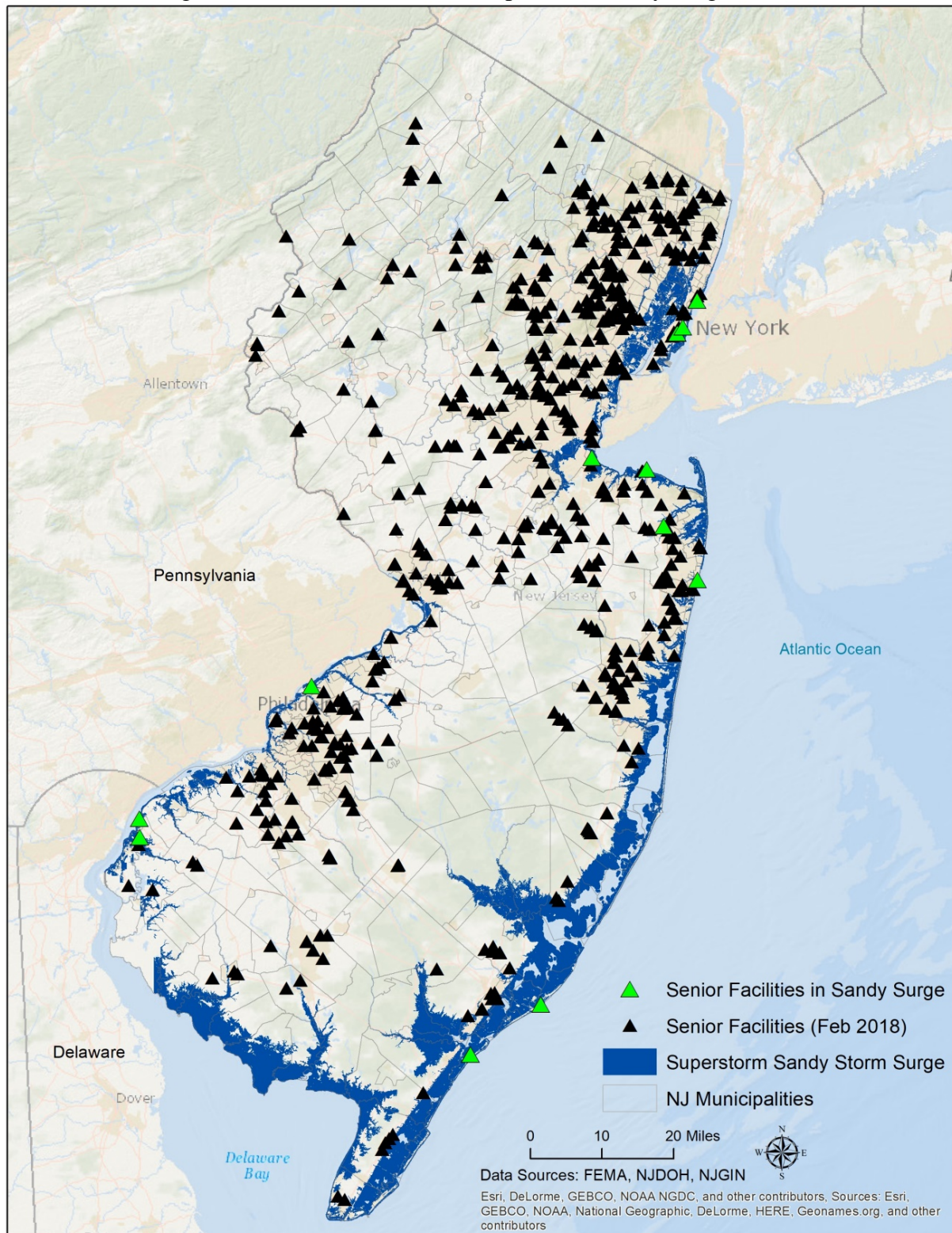


Figure C.5. Senior Facilities in Hurricane Irene Surge Extent

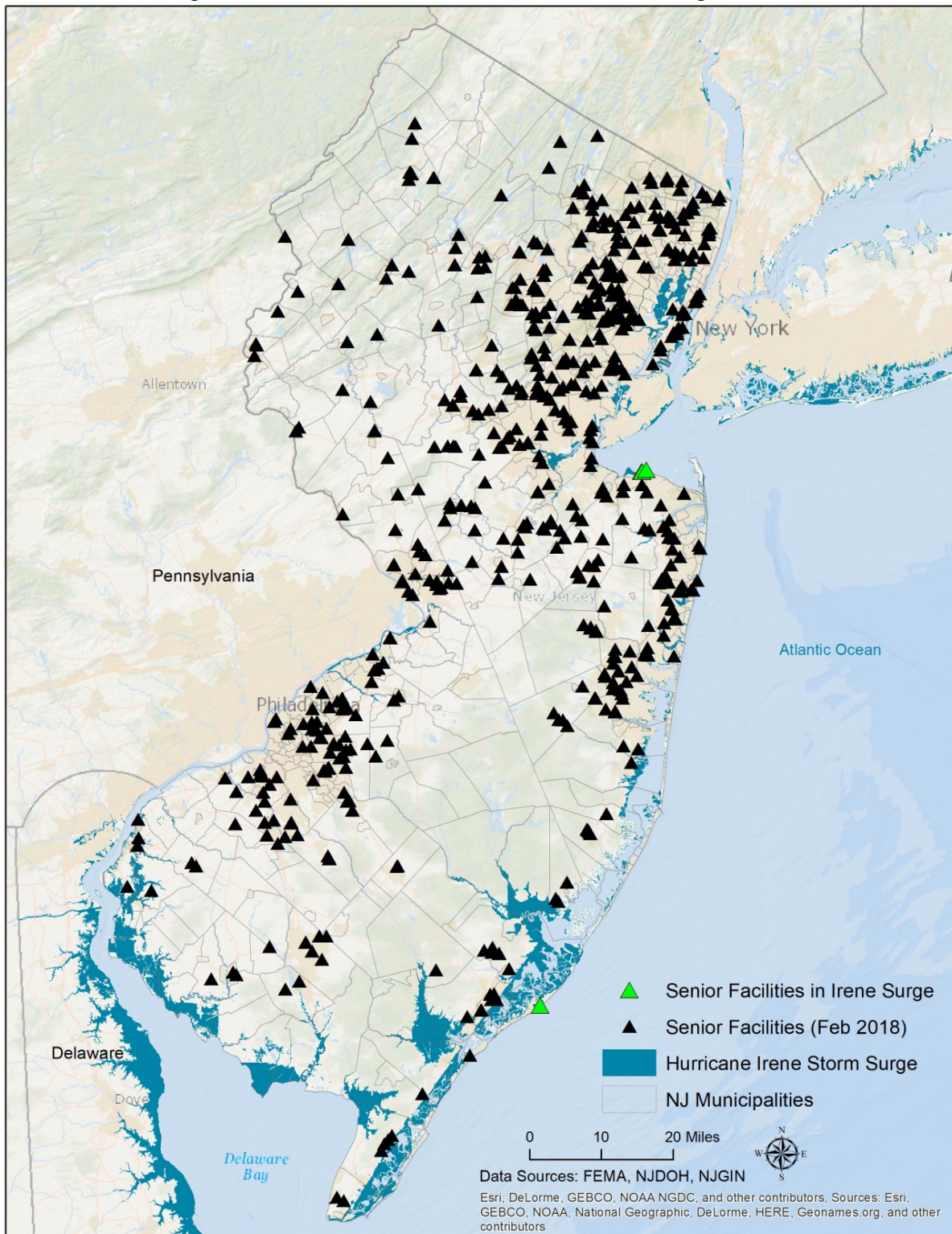


Figure C.6. Senior Facilities in FEMA Floodplain (100yr and 500yr)

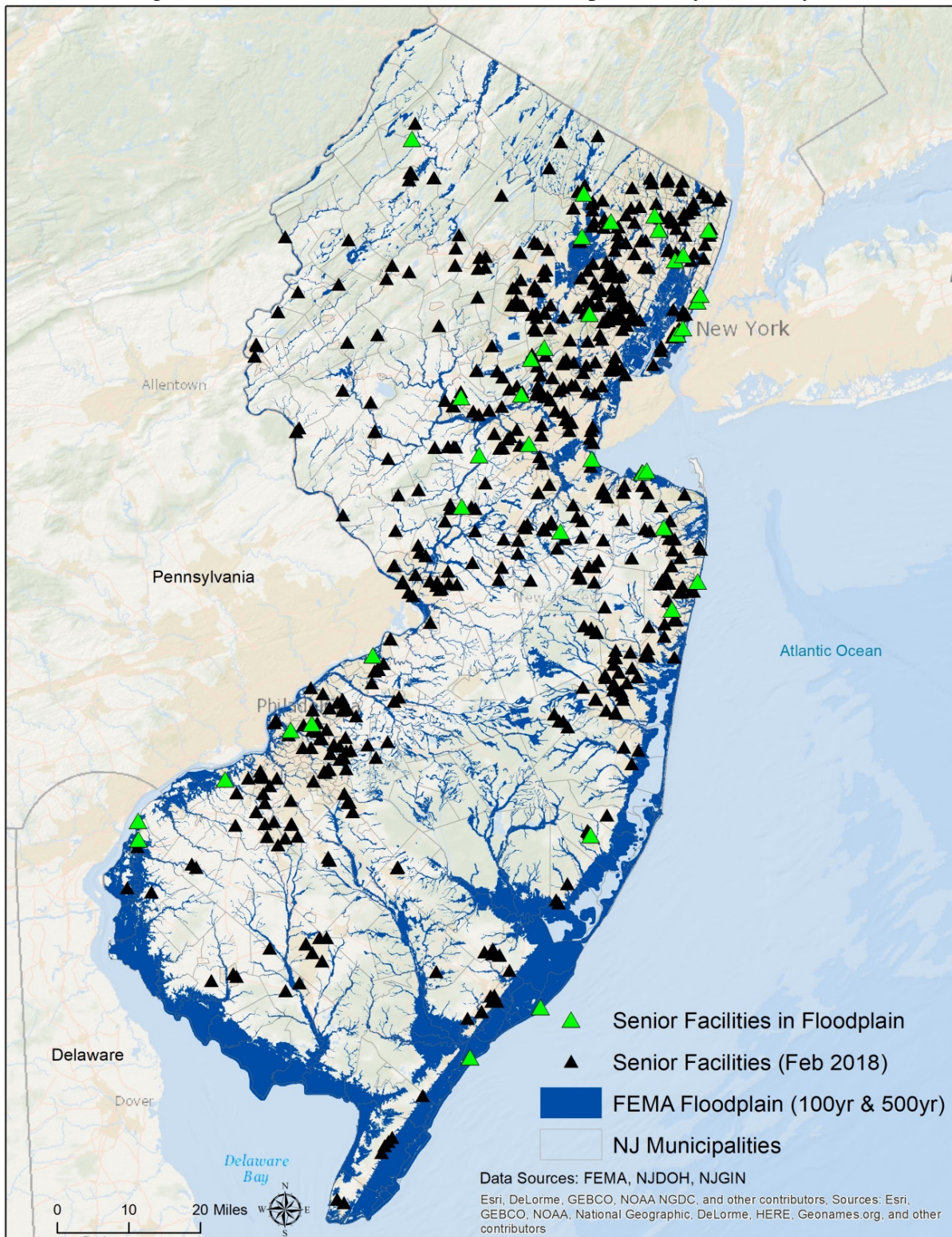


Figure C.7. Senior Facilities in Shallow Coastal Flooding Area

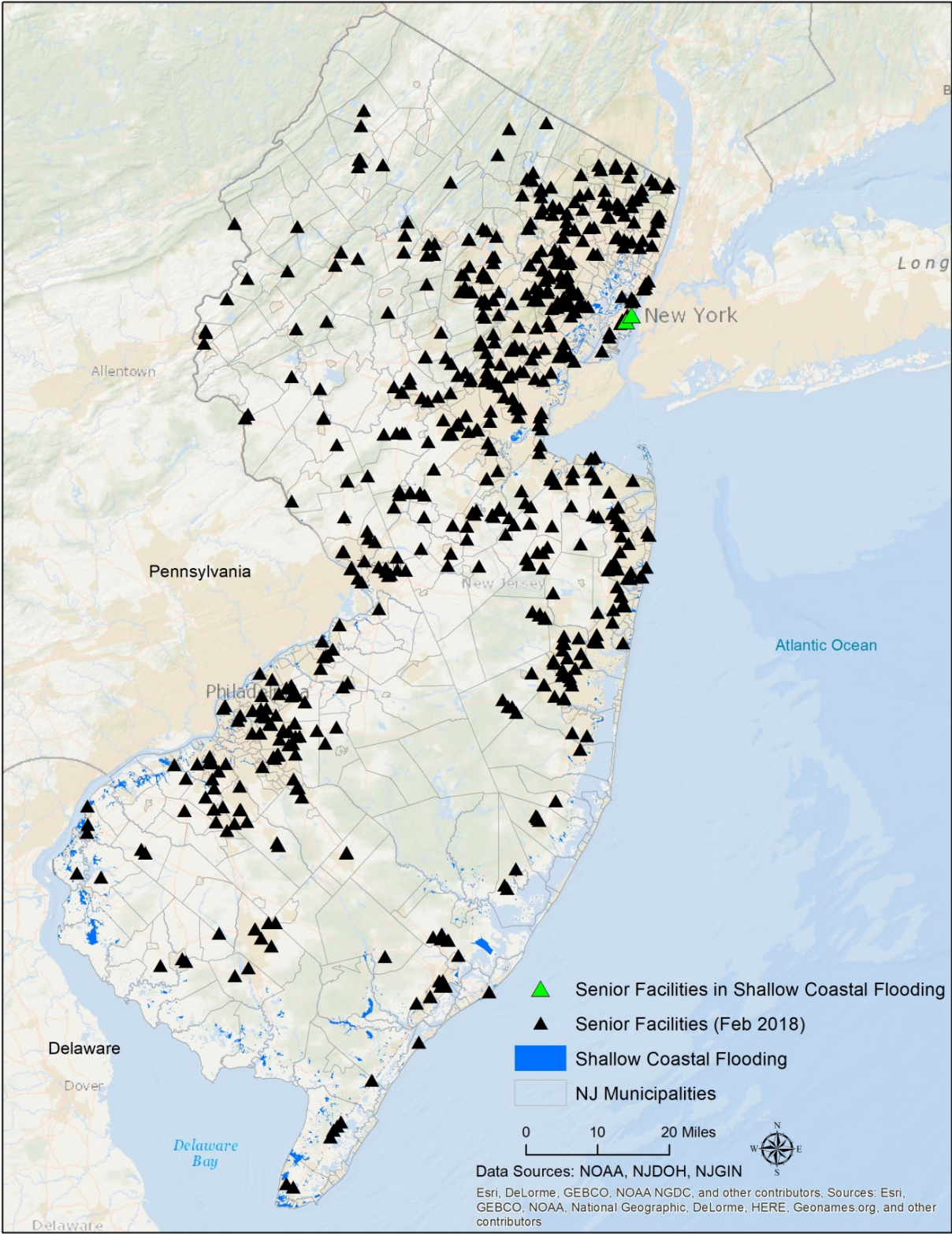


Figure C.8. Senior Facilities in 1 Foot of Sea Level Rise

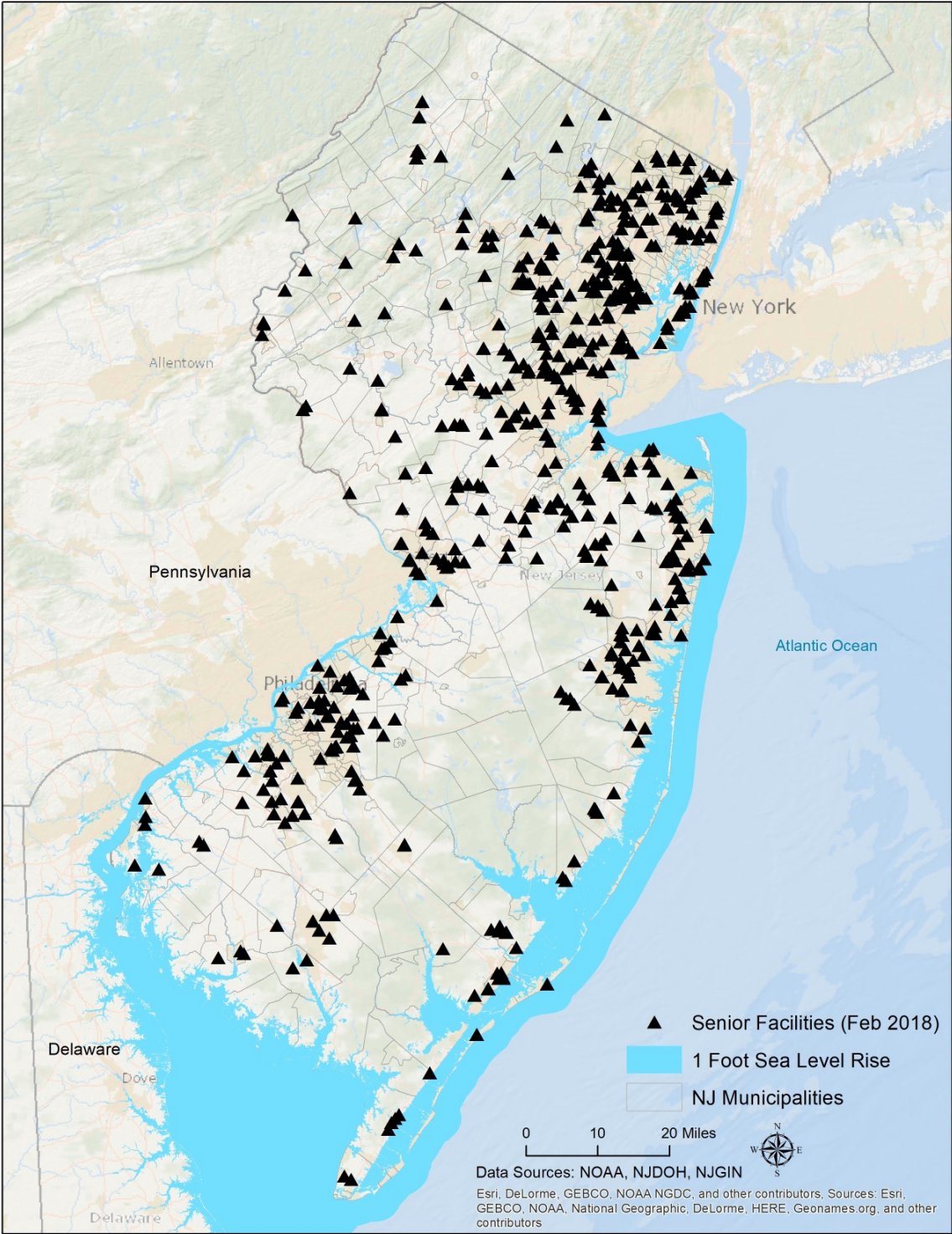


Figure C.9. Senior Facilities in 2 Feet of Sea Level Rise

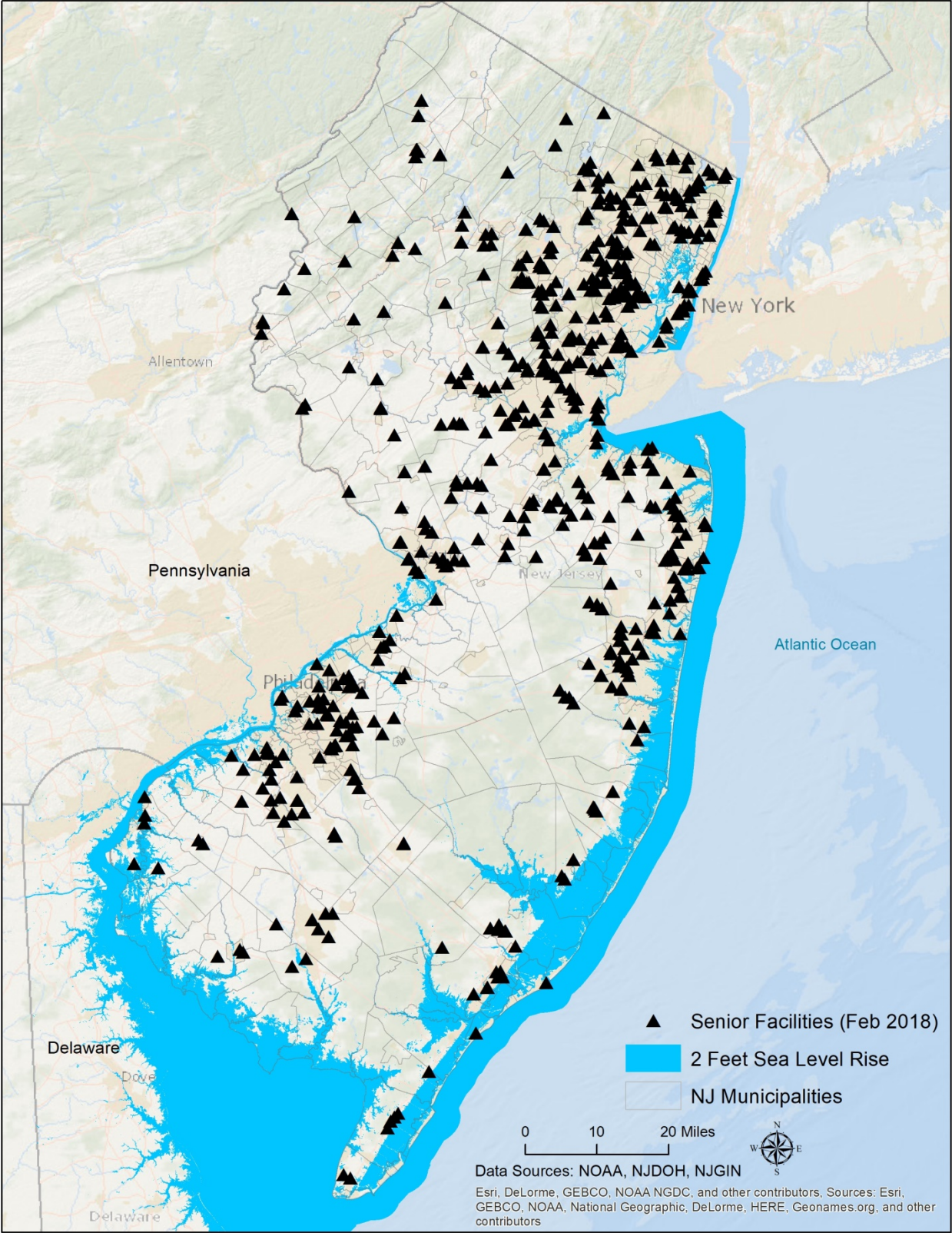


Figure C.10. Senior Facilities in 3 Feet of Sea Level Rise

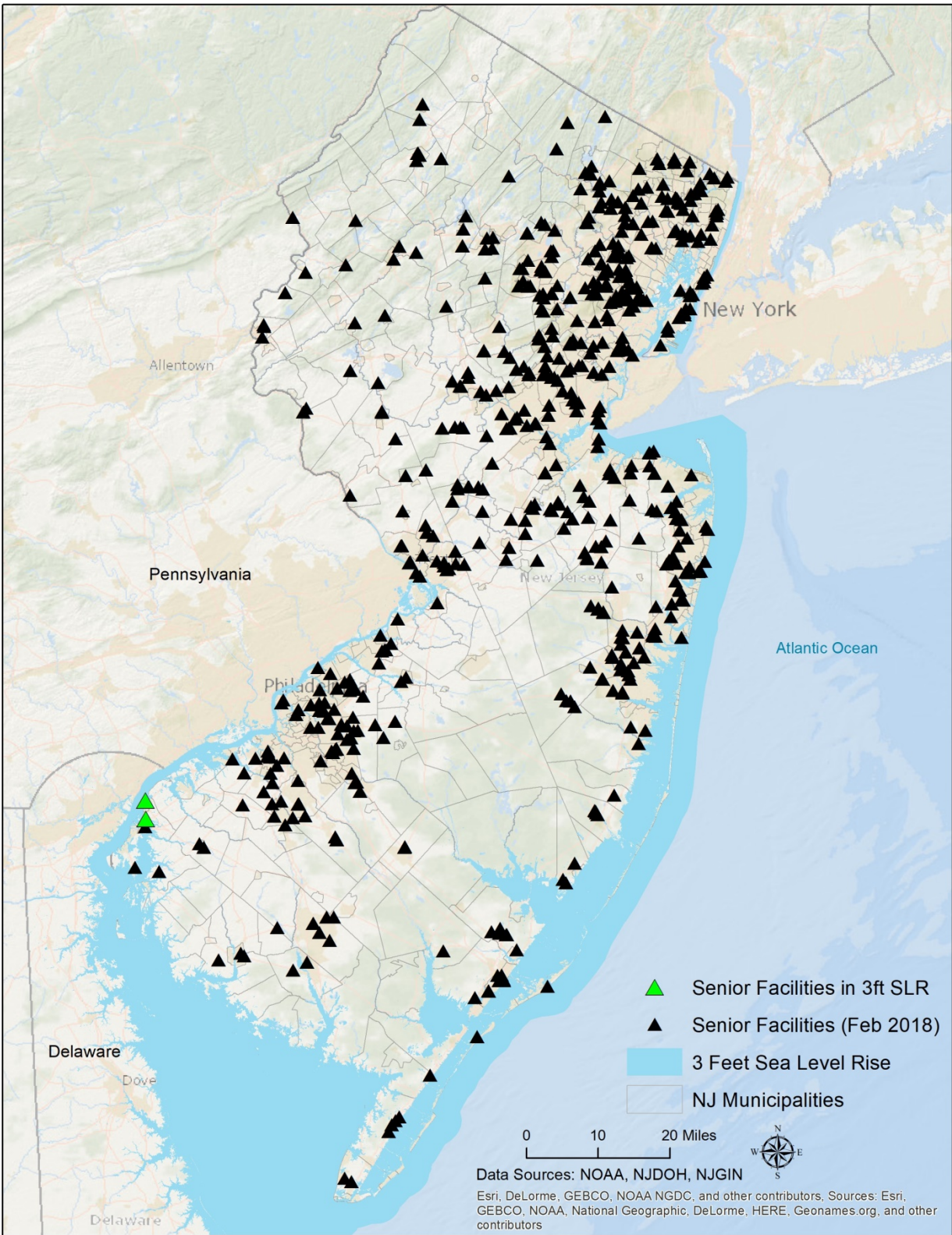


Figure C.11. Senior Facilities in Category 1 Storm Surge

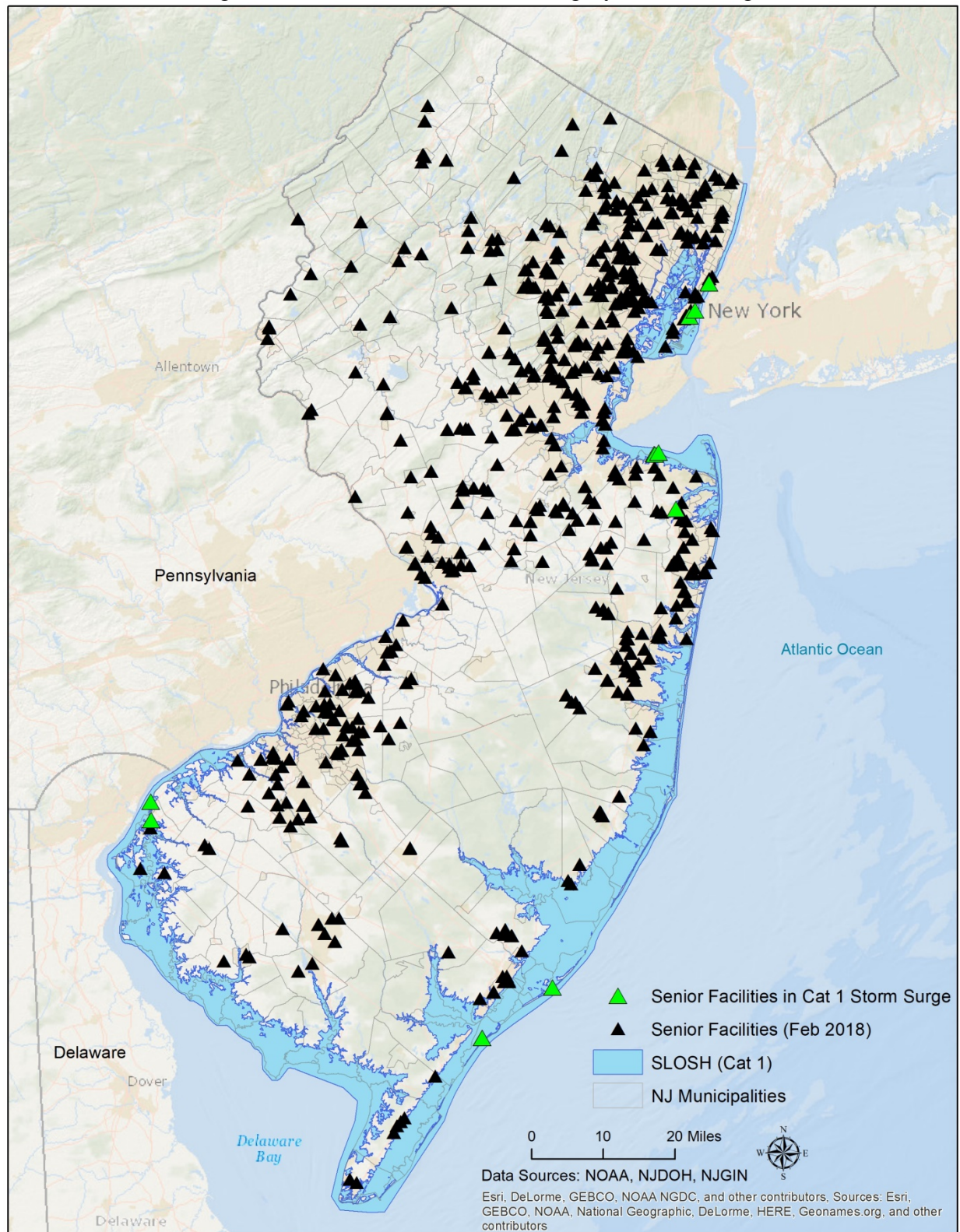


Figure C.12. Senior Facilities in Category 2 Storm Surge

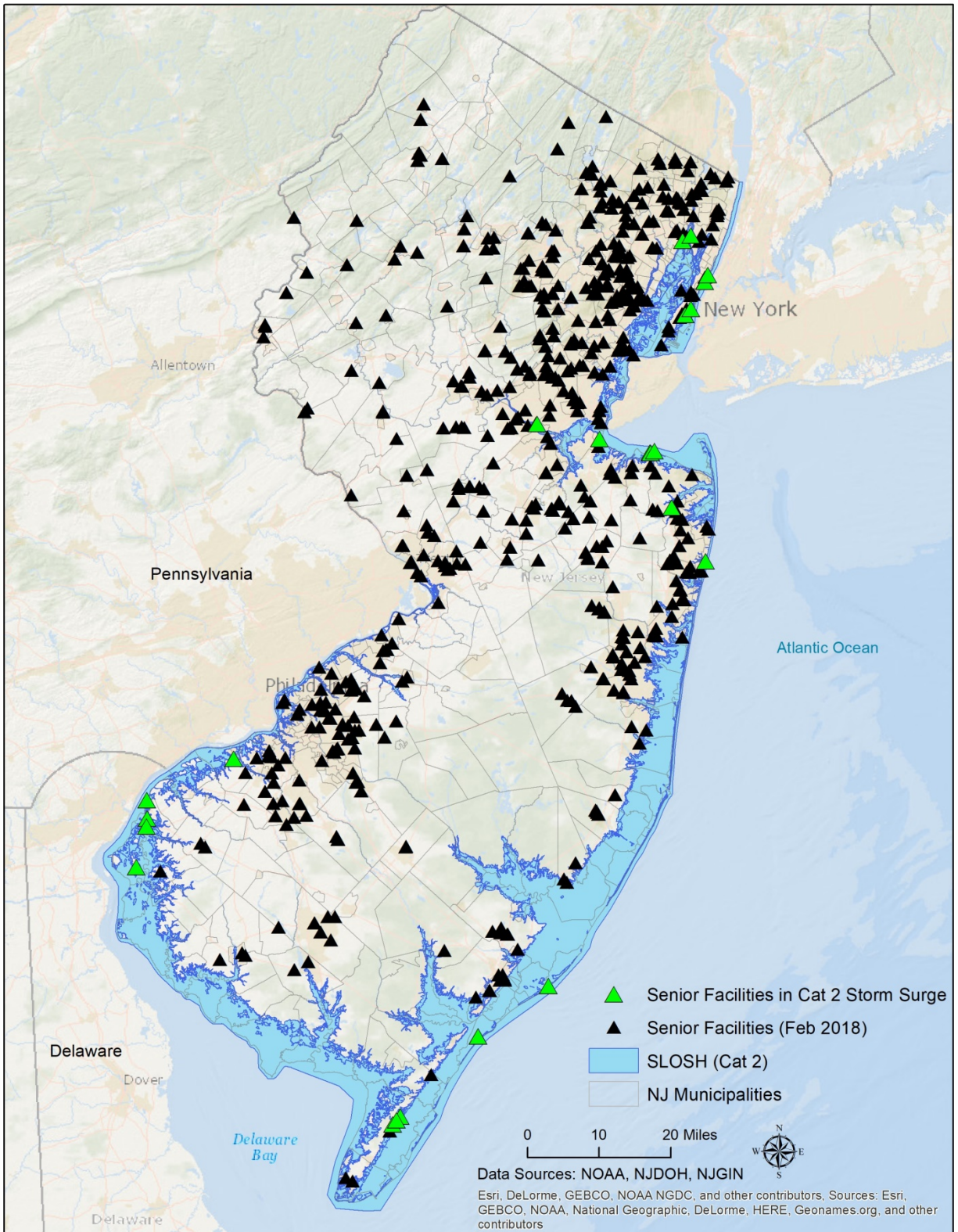


Figure C.13. Senior Facilities in Category 3 Storm Surge

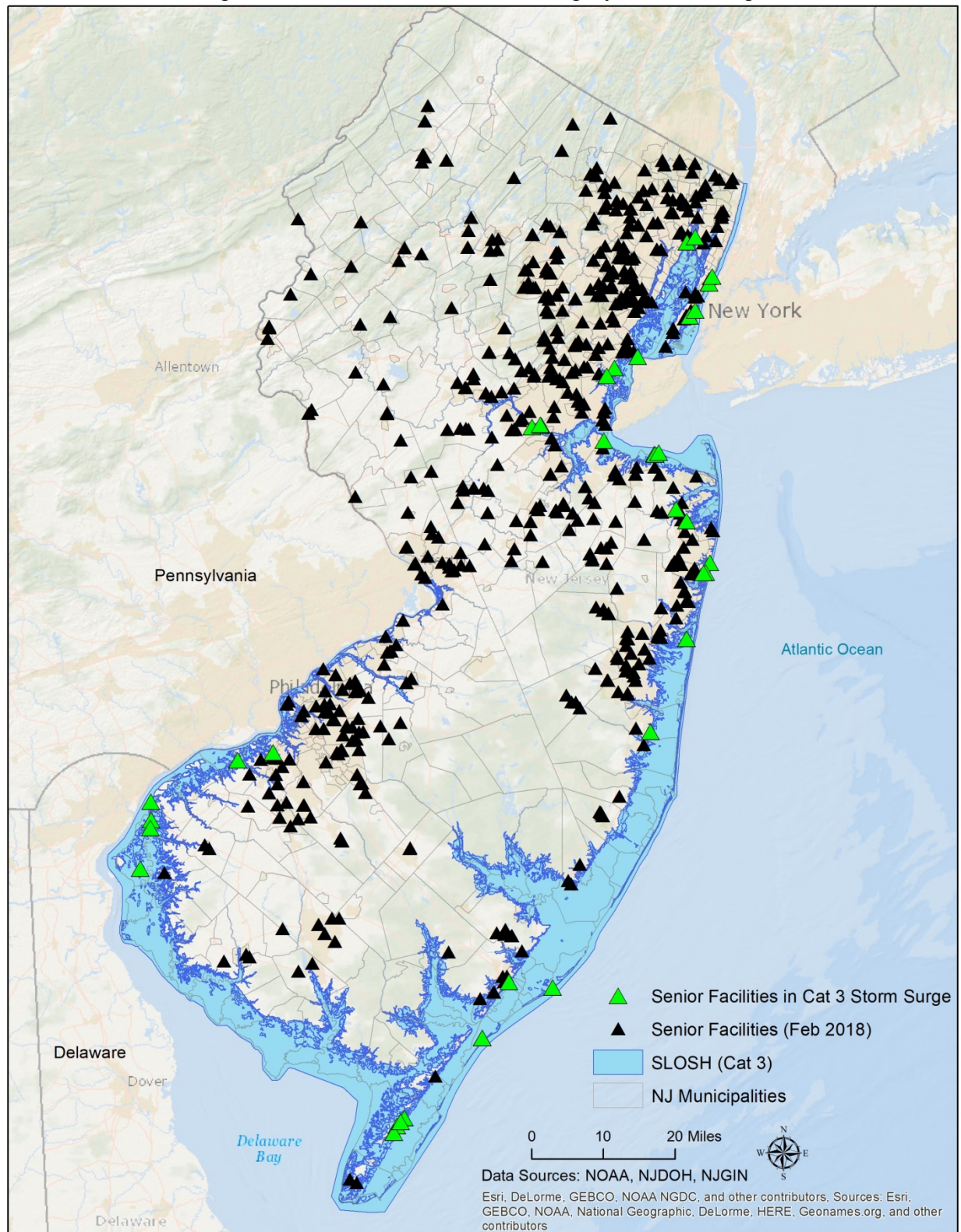
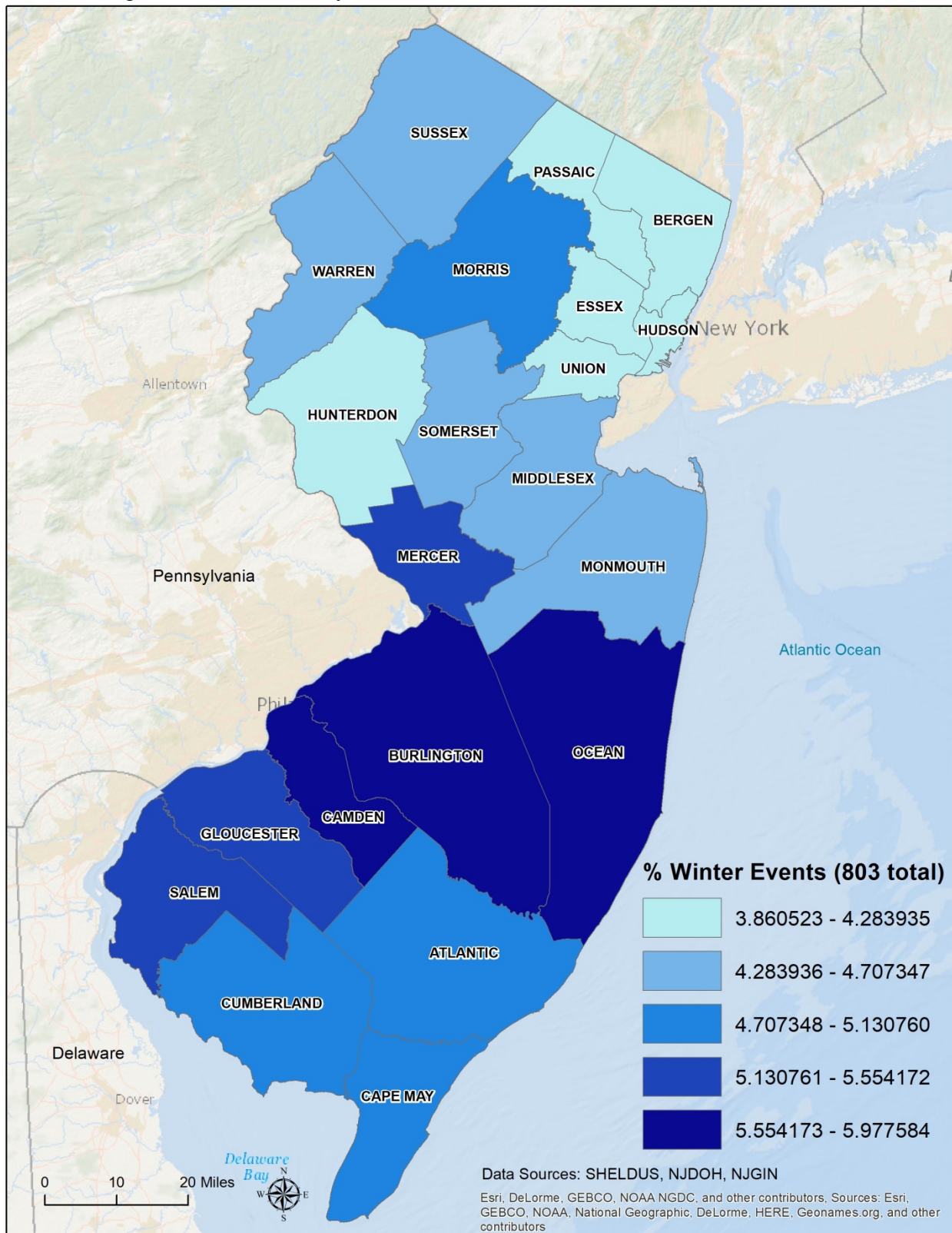


Figure C.14. New Jersey Counties with Winter Storm Events (1960 to 2016)



APPENDIX D

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
Mandatory Immediate Notifications to NJDOH		
8:43E-10.11(b)	A facility licensed in accordance with N.J.S.A. 26:2H-1 et seq. shall notify the Department immediately of the types of reportable events described in (c) and (d) below	
8:43E-10.11(b)3	In the case of long-term care facilities, "immediately" means telephonic notification to the Department at (609) 392-2020 followed by written notification within 72 hours.	
8:43E-10.11(c)	<p>Examples of reportable events in the nature of physical plant and operational interruptions, include, but are not limited to, the following:</p> <ol style="list-style-type: none"> 1. Loss of heat or air conditioning; 2. Loss or significant reduction of water, electrical power, or any other essential utilities necessary to the operation of the facility; 3. Fires, disasters, or accidents that result in injury or death of patients, residents or employees, or in evacuation of patients or residents from all or part of the facility; 4. A labor stoppage or staffing shortage sufficient to require the temporary closure of a service; and 5. Notices of a potential strike that a facility receives from an employee bargaining unit. <p>i. The report shall be accompanied by the facility's plan to continue service operations in the event the strike occurs.</p>	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
8:43E-10.11(d)	<p>Examples of reportable events in the nature of potentially criminal acts include, but are not limited to, the following:</p> <ol style="list-style-type: none"> 1. Any instance of care ordered by or provided by someone impersonating a physician, nurse, pharmacist, or other licensed health care provider; 2. Abduction of a patient or resident of any age; 3. Sexual assault on a patient or resident, staff member, or visitor within or on the grounds of a facility; and 4. Death or significant injury of a patient or resident, staff member, or visitor 	
8:43E-10.11(e)	A health care facility shall report incidents of infectious and communicable diseases to the Department pursuant to N.J.A.C. 8:57.	
Mandatory fire and emergency preparedness		
8:39-31.6(a)	Employees shall be trained in procedures to be followed in an emergency operation plan and instructed in the use of fire fighting equipment and resident evacuation of the buildings as part of their initial orientation and at least annually thereafter.	
8:39-31.6(b)	Fire drills shall be conducted a total of 12 times per year, with at least one drill on each shift and one drill on a weekend. The facility shall attempt to have the local fire department participate in at least one fire drill per year. An actual alarm shall be considered a drill if it is documented.	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
8:39-31.6(c)	Fire regulations and procedures shall be posted in each unit and/or department. A written fire evacuation diagram that includes evacuation procedures and locations of fire exits, alarm boxes, and fire extinguishers shall be posted conspicuously on a wall in each resident care unit and/or department throughout the facility.	
8:39-31.6(f)	The facility shall have a written comprehensive emergency operations plan developed in coordination with the local office of emergency management.	
8:39-31.6(f)1	Identify potential hazards that could necessitate an evacuation, including natural disasters, national disasters, industrial and nuclear accidents, and labor work stoppages [Perform a Hazards Vulnerability Assessment]	
8:39-31.6(f)2	Identify the facility and an alternative facility to which residents would be relocated, and include signed, current agreements with the facilities [Memoranda of Agreement with like or higher licensed facilities, no “evergreen” Memoranda of Agreement, recommend that signatures be less than 1 year old]	
8:39-31.6(f)3	Identify the number, type and source of vehicles available to the facility for relocation and include signed current agreements with transportation providers. Specially configured vehicles shall be included [Memoranda of Agreement with any transportation services, other than those belonging to the facility itself, including ambulances. Recommend that signatures be less than 1 year old]	
8:39-31.6(f)4	Include a mechanism for identifying the number of residents, staff, and family members who would require relocation and procedures for evacuation of non-ambulatory residents from the facility	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
8:39-31.6(f)5	List the supplies, equipment, records, and medications that would be transported as part of an evacuation, and identify by title the individuals who would be responsible	
8:39-31.6(f)6	Identify essential personnel who would be required to remain on duty during the period of relocation [who would staff the facility during the evacuation, who would go with the patients, are all staff essential, etc]	
8:39-31.6(f)7	Identify by title and post in a prominent place the name(s) of the persons who would be responsible for the following:	
8:39-31.6(f)7i	Activating the emergency operations plan, issuing evacuation orders, and notifying of State and municipal authorities [Who will be the Incident Commander and also make State and local notifications?]	
8:39-31.6(f)7ii	Alerting and notifying of staff and residents	
8:39-31.6(f)7iii	Facility shutdown and restart	
8:39-31.6(f)7iv	In place sheltering of residents and continuity of medical care	
8:39-31.6(f)7v	Emergency services such as security and firefighting	
8:39-31.6(f)8	Describe procedures for how each item in 8:39-31.6(f)7 (above) will be accomplished	
8:39-31.6(g)	There shall be a written plan for receiving residents who are being relocated from another facility due to a disaster. This plan shall include at least an estimate of the number and type of residents the facility would accommodate and how staffing would be handled at different occupancy levels [When the facility is not the one experiencing the emergency, how will they be able to accept residents from other facilities, how many can they accept, will they alter staffing ratios with request for waivers from NJDOH or will they call in additional staff, etc]	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
8:39-31.6(h)	Copies of the emergency operations plan shall be sent to municipal and county emergency management officials for their review [Review is required, however acceptance/signoff is not; however, the facility is required to develop the plan in conjunction with local OEM officials as per 8:39-31.6(f)]	
8:39-31.6(i)	The administrator shall serve as, or appoint, a disaster planner for the facility	
8:39-31.6(i)1	The disaster planner shall meet with county and municipal emergency management coordinators at least once each year to review and update the written comprehensive evacuation plan; or if county or municipal officials are unavailable for this purpose, the facility shall notify the State Office of Emergency Management	
8:39-31.6(i)2	While developing the facility's evacuation plan, the disaster planner shall coordinate with the facility or facilities designated to receive relocated residents [The facility must document that they've planned this out with their receiving facilities and that all parties are in agreement]	
8:39-31.6(j)	Any staff member who is designated as the acting administrator shall be knowledgeable about and authorized to implement the facility's plans in the event of an emergency	
8:39-31.6(k)	All staff shall be oriented to the facility's current plans for receiving and evacuating residents in the event of a disaster, including their individual duties	
8:39-31.6(l)	The facility shall ensure that the residents receive nursing care throughout the period of evacuation and return to the original facility	
8:39-31.6(m)	The facility shall ensure that evacuated residents who are not discharged are returned to the facility after the emergency is over [The facility has the responsibility for repatriation of all non-discharged patients, specifically patients who are not discharged to family members]	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Regulation	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
8:39-31.6(n)	The facility shall maintain at least a three-day supply of food and have access to an alternative supply of water in case of an emergency [The three-day supply of food should be marked/segregated from the daily food intake; this will be verified by most inspectors during the annual inspection]	
8:39-31.6(o)	The facility shall conduct at least one evacuation drill each year, either simulated or using selected residents. State, county, and municipal emergency management officials shall be invited to attend the drill at least 10 working days in advance	
8:39-31.6(p)	The facility shall establish a written heat emergency action plan which specifies procedures to be followed in the event that the indoor temperature is 82 degrees Fahrenheit or higher for a continuous period of four hours or longer	
8:39-31.6(p)1	These procedures shall include the immediate notification of the Department of Health and Senior Services	
8:39-31.6(p)4	The heat emergency action plan shall include a comprehensive series of measures to be taken to protect residents from the effects of excessively high temperatures	
Mandatory Safety Requirements including Backup Power		
8:39-31.7(a)	An outlet that is connected to an emergency power supply shall be used wherever life-sustaining equipment is in operation [This is interpreted as equipment whose interruption, even for 1 minute or more, would potentially cause the patient to expire; such might include ventilators that are in constant operation for patients incapable of breathing on their own]	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Item	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
Chain of Command List	Determines who is in charge of the facility at all times	
Emergency Phone List	Listing of all appropriate emergency response agencies, Senior Staff, emergency supply vendors, and other necessary emergency contacts	
Facility Floor Plans	Emergency exits; fire alarm pull stations, extinguishers; standpipes; room locations; utility lines; fixed oxygen lines	
Healthcare Emergency Codes	Codes used for medical emergency, fire, and other emergencies	
Tornado Preparedness	Steps to prepare the facility and residents for tornados if a Tornado Warning is issued	
Snow Emergency Plans	Mitigation through Response to Recovery for snow emergencies including food, staffing (along with housing of staff if needed), utility loss (can refer to utility loss section), etc	
Cold Emergencies	Internal and external cold problems including notification thresholds to OEM and NJDOH	
Heat Emergencies	Internal and external heat problems including notification thresholds to OEM and NJDOH	
Hurricane & Severe Storms	Decision making matrix for when to shelter in place vs. evacuate; resources needed; timelines; other necessary items	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Item	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
Flood Emergencies	Containment within the facility and when to evacuate (vertical, horizontal, external)	
Earthquake	Damage assessment & containment, need to evacuate (vertical, horizontal, external)	
Loss of Utilities	Water, Gas, Electric, Sewage, Communications	
Staffing Emergency	Loss of staff due to interior or exterior problem, work stoppage, state of emergency declaration	
CBRNE event (near or at facility)	Contacts at OEM/local 9-1-1 Resources; Containment &/or decontamination, if appropriate and capable	
Loss of Medical Gases	Fixed vs. portable systems; emergency resupply; relocation of those on medical gases that cannot be replaced	
Bomb Threat	Bomb Threat Checklist; instructions; notifications; evacuations of area/facility if appropriate	
Civil Disturbance/Emotionally disturbed person	Interior and exterior threat plans	
Evacuation Procedure	Notifications; Resources required; timeline; continuity of medical care; destinations; agreements for transport; agreements for acceptance	
Reentry/Remediation/Restoration	Recovery post evacuation or emergency including recovery of patients	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Item	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
Training & exercising on plan & emergencies	Training & exercising covering all aspects of the plan; annual training; records of training	
Surge capacity	Notification; staffing; resources	
NJDOH Regulations	Copy of all regulations available to the facility; also copies of emergency preparedness regulations (citations or included in plan)	
Requirements for maintenance record keeping for emergency preparedness	Generator run times (both routine test & power outage start/stop times/dates); other preventative maintenance records of emergency systems (fire sprinklers, alarms, etc)	
Review and agreement/approval/acceptance of municipal &/or county OEM, Fire, Police, EMS, and/or other appropriate agencies	Should have, per regulation, confirmation of receipt of plan by municipal & county OEM; recommend getting approval signoff by local &/or county OEM	
Nuclear Emergency Procedures (for facilities within 10 mile EPZ of nuclear generating stations)	Shelter in place vs. evacuation; routes; resources; notification from authorities; notification to NJDOH	
Hazard & Vulnerability Assessment	Matrix of possible hazards and vulnerabilities, rating how likely they are to occur and how severely they will impact the facility if they occur	
Medical Continuity of Care	How will care be maintained, including appropriate records, if emergency transfer is required due to partial/full evacuation	

NJDOH Recommended Items for inclusion in Long Term Care Facilities Emergency Preparedness Plans

Item	Explanation	Document Reference (Please enter Page #, Paragraph, and Document Name)
Emergency Dietary Menu	Loss of normal food supplies requires emergency menu; how much per patient per meal; verification of sufficient on-hand supplies	
Loss of regular supplies	Loss of laundry services; fuel delivery (oil/diesel); medical gases (can refer to another section)	
Fire Procedures	Internal & external notification; R-A-C-E or other similar system; fire training; patient evacuation from room/danger zone	

CMS Emergency Preparedness Final Rule

Crosswalk - UPDATED

Version 2 Published April 17, 2017

The following tables represent a visualization of the association between the CMS Emergency Preparedness Final Rule Conditions of Participation ([Link to Final Rule](#)) and existing regulatory and accreditation standards.

- This crosswalk is not intended to replace reading and understanding the regulations promulgated by CMS, individual States or the standards provided by the specific accrediting organizations (AOs). Please consult with your organization's legal and regulatory team for impact on your individual facility.
- This crosswalk is intended to serve as a high level "Quick Reference Guide" and not as interpretive guidance or instructions on how to achieve compliance.
- Specific questions on individual facility compliance must still be directed to AOs, surveyors, and Centers for Medicare and Medicaid Services (CMS).
- This crosswalk used the AO standards as available and printed as of October 2016 and NOT standards that may be updated based on the release of the CMS EP rule or interpretive guidance, therefore all facilities must check with their AO for the most current standards.
- This crosswalk is a product of Yale New Haven Health System Center for Emergency Preparedness and Disaster Response's (YNHHS-CEPDR) and has not been reviewed or approved by the CMS or by any AO. For questions or concerns with this product please contact YNHHS-CEPDR at center@ynhh.org.

The crosswalk was created by mapping emergency and disaster related program, policy, communication, training and exercise elements of regulatory and accreditation standards to the CMS Emergency Preparedness Conditions of Participation. The AOs represented in the crosswalk are those listed on the following document: [CMS Accrediting Organization Contacts](#).

Every effort was made to ensure that the mapped Conditions of Participation and accreditation standards matched as closely as possible. A number of subject matter experts internal and external to YNHHS CEPDR contributed to the creation of this document, we are extremely grateful for their input. *However, this document should be used only as a guide for reviewing and updating emergency preparedness plans and does not replace existing federal, local, or association guidance.*

It should be noted that the crosswalk includes reference to both NFPA 1600 and NFPA 99 as a convenience to users, not because they are adopted by CMS. Many organizations built prior emergency plans based on these NFPA standards and it is anticipated that some AO's may continue to reference these standards.

Printing Note: The full document is lengthy and is printed on legal size paper. You may wish to print only the section(s) most relevant to your organization. Be sure to use the PDF page numbers when selecting your print range.

Click on the associated facility type below to review the relevant standards.

- | | |
|--|--|
| • Ambulatory Surgical Center | • Program for the All Inclusive Care for the Elderly |
| • Hospital | • End Stage Renal Disease |
| • Clinics, Rehabilitation and Therapy | • Psychiatric Residential Treatment Facility |
| • Immediate Care Facility –Intellectual Disability | • Home Health Agency |
| • Community Mental Health Center | • Religious Non-Medical Healthcare Institution |
| • Long Term Care Facility | • Hospice |
| • Comprehensive Outpatient Rehab | • Rural Health Care-FQHC |
| • Organ Procurement Organization | • Transplant Center |
| • Critical Access Hospital | |

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
October 2016	483.73	2016	2012 Edition
Require both an emergency preparedness program and an emergency preparedness plan	483.73		12.2.2.3 12.2.3.2 12.4.1 12.5.1
Comply with all applicable Federal, State and local emergency preparedness requirements. The emergency plan must be reviewed and updated at least annually.	483.73		12.2.3.3 12.4.1.2 12.5.3.6.1
The emergency plan must be based on and include a documented facility based and community based risk assessment utilizing an all hazards approach including missing residents	483.73 a 1	4.4.2 5.1.3 5.1.4 5.2.1	12.5.2 12.5.3.1
The emergency plan includes strategies for addressing emergency events identified by the risk assessment.	483.73 a 2	5.1.5 6.6.2	12.5.3.2 12.5.3.3
The emergency plan must address the patient population including the types of services that the facility would be able to provide in an emergency; continuity of operations, including delegations of authority and succession plans	483.73 a 3	5.2.2.2	12.2.2.3 12.5.3.1.3(1) 12.5.3.2.3(11) 12.5.3.3.6.4
Have a process for ensuring cooperation and collaboration with local, tribal, regional, state, or Federal emergency preparedness officials’ efforts to maintain an integrated response during a disaster or emergency situation, including documentation of the facility efforts to contact such officials and, when applicable, its participation in collaborative and cooperative planning efforts.	483.73 a 4		12.2.3.3 12.5.3.3.6.1(2)(6)

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
Policies and Procedures	Policies and Procedures		
Develop and implement emergency preparedness policies and procedures based on the emergency plan set forth in (a) and (a) (1) and the communications plan section (C). The policies and procedures must be reviewed and updated at least annually.	483.73 b		12.5.3.3.5 12.5.3.3.6.1 12.5.3.6.1
The policies and procedures must address (1) the provision of subsistence needs for staff and patients whether they evacuate or shelter in place including but not limited to (i) food, water, medical and pharmaceutical supplies (ii) alternate sources of energy to maintain: (A) temperatures to protect patient health and safety and for the safe and sanitary storage of provisions (B) emergency lighting (C) fire detection, extinguishing and alarm systems (D) sewage and waste disposal	483.73 b 1 i-ii A-D		12.5.3.3.6.2 12.5.3.3.6.4(7)(8) 12.5.3.3.6.5 12.5.3.3.6.6
Develops a system to track the location of on-duty staff and sheltered patients in the facility's care during an emergency. If on-duty staff or sheltered patients are relocated during the emergency the facility must document the specific name and location of the receiving facility or other location.	488.73 2		12.5.3.3.6.4(9)
Have policies and procedures in place to ensure the safe evacuation from the facility, which includes consideration of care and treatment needs of evacuees; staff responsibilities; transportation; identification of evacuation location(s); and primary and alternate means of communication with external sources of assistance.	488.73 3		12.5.3.3.6.1(3)(4) 12.5.3.3.6.2(7) 12.5.3.3.6.4(1)(6)(7)(8)(9) 12.5.3.3.6.8
Have a means to shelter in place for patients, staff and volunteers who remain in the facility	488.73 4		12.5.3.3.3 12.5.3.3.6
Have a system of medical documentation that preserves patient information, protects the confidentiality of patient information and secures and maintains availability of records.	488.73 5	4.7.2	12.5.3.3.6.1(4)
Have policies and procedures in place to address the use of volunteers in an emergency and other emergency staffing strategies, including the process and role for integration of State or Federally designated health care professionals to address surge needs during an emergency.	488.73 6	6.9.1.2	12.5.3.4.5
The development of arrangements with other facilities and other providers to receive residents in the event of limitations or cessation of operations to maintain the continuity of services to residents	488.73 7	6.9.1.2	
Policies and procedures to address the role of the hospital under a waiver declared by the Secretary, in accordance with section 1135 of the Act, for the provision of care and treatment at an alternate care site (ACS) identified by emergency management officials.	488.73 8		

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
Communication Plan	Communication Plan		
Be required to develop and maintain an emergency preparedness communication plan that complies with local, state and Federal law and required to review and update the communication plan at least annually.	488.73 (C)	6.4	12.5.3.3.6.1
As part of its communication plan include in its plan, names and contact information for staff; entities providing services under arrangement; residents’ physicians, other facilities and volunteers.	488.73 (C) 1 i-v	6.4.1	
Require contact information for Federal, State, tribal, regional, or local emergency preparedness staff and other sources of assistance.	488.73 (C) 2 i-iv	6.4.1	12.5.3.3.6.1(6)
Include primary and alternate means for communicating with facility staff and Federal, State, tribal, regional, and local emergency management agencies	488.73 (C) 3 i-ii	6.4.1	12.5.3.3.6.1
Include a method for sharing information and medical documentation for residents under the facility's care, as necessary, with other health care providers to maintain continuity of care.	488.73 (C) 4		12.5.3.3.6.1(4)
Have a means, in the event of an evacuation, to release patient information as permitted under 45 CFR 164.510 (b) (1) (ii).	488.73 (C) 5	6.4.1	12.5.3.3.6.1(4)
Have a means of providing information about the general condition and location of patients under the facility’s care, as permitted under 45 CFR 164.510(b)(4)	488.73 (C) 6		12.5.3.3.6.1(4)
Have a means of providing information about the facility occupancy, needs, and its ability to provide assistance, to the authority having jurisdiction or the Incident Command Center, or designee.	488.73 (C) 7		12.5.3.3.6.1(2)(6)
A method for sharing information from the emergency plan that the facility has determined is appropriate with residents and their families or representatives.	488.73 (C) 8		

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
Training and Testing	Training and Testing		
Develop and maintain an emergency preparedness training and testing program based on the emergency plan, risk assessment, policies and procedures and communications plan. The training and testing program must be reviewed and updated at least annually.	488.73 (D)	7.1	12.3.3.10
Provide initial training in emergency preparedness polices and procedures to all new and existing staff, individuals providing on-site services under arrangement and volunteers consistent with their expected roles. Provide this training annually and maintain documentation of all emergency preparedness training along with demonstration of staff knowledge of emergency procedures.	488.73 (D) (1) (i-iv)	7.1	12.3.3.10
Conduct exercises to test the emergency plan at least annually	488.73 (D) (2)	8.1.1 8.5.1	12.3.3.10
Participate in community mock disaster drill at least annual or when community mock disaster drill is not available, conduct an individual, facility-based mock disaster drill at least annually.	488.73 (D) (2) (i)		
If the facility experiences and actual natural or man made emergency that requires activation of the emergency plan, the facility is exempt from engaging in a community based or individual, facility based mock disaster drill for one year following the onset of the actual event	488.73 (D) (2) (i)		
Conduct a paper based tabletop exercise at least annual that includes a group discussion led by a facilitator using a narrated, clinically relevant emergency scenario and a set of problem statements, directed messages or prepared questions designed to challenge the emergency plan	488.73 (D) (2) (ii) A-B		12.3.3.2
Analyze the response to and maintain documentation of all drills, tabletop exercises and emergency events and revise the facility emergency plan as needed	488.73 (D) (2) (iii)		12.3.3.2
Additional Requirements	Additional Requirements		
Emergency and standby power systems- The hospital must implement emergency and standby power systems based on the emergency plan set forth in paragraph (a) of this section and in the policies and procedures plan set forth in paragraphs (b)(1)(i) and (ii) of this section	488.73 (E)		
Emergency generator location. The generator must be located in accordance with the location requirements found in the Health Care Facilities Code NFPA 99 and Tentative Interim Amendments TIA 12-2, TIA 12-3, TIA 12-5, and TIA 12-6), Life Safety Code (NFPA 101 and Tentative Interim Amendments TIA 12-1, 12-2, TIA 12-3 and TIA 12-4) and NFPA 110, when a new structure is built or an existing structure is renovated.	488.73 (E) 1		
Emergency generator inspection and testing. The facility must implement the emergency power system inspection, testing and maintenance requirements found in the Health Care Facilities Code NFPA 110 and Life Safety Code	488.73 (E) 2		
Emergency generator fuel. Facilities that maintain an onsite fuel source to power emergency generators must have a plan for how it will keep emergency power systems operational during the emergency, unless it evacuates.	488.73 (E) 3		

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
Integrated Healthcare Systems	Integrated Healthcare Systems		
If the facility is part of a healthcare system consisting of multiple separately certified healthcare facilities that elects to have a unified and integrated emergency preparedness program, the facility may choose to participate in such a program. And must meet the following standards	488.73 (F)		
Demonstrate that each separately certified facility within the system actively participated in the development of the unified and integrated emergency preparedness program	488.73 (F) 1		
The unified and integrated emergency preparedness program must be developed and maintained in a manner that takes into account each separately certified facility's unique circumstances, patient populations and services offered.	488.73 (F) 2		
Demonstrate that each separately certified facility is capable of actively using the unified and integrated emergency preparedness program and is in compliance with the program	488.73 (F) 3		
Include a unified and integrated emergency plan that meets all standards of paragraphs (a) (2), (3), and (4) of this section.	488.73 (F) 4		

CMS Emergency Preparedness Conditions of Participation Language	CMS Emergency Preparedness Conditions of Participation Reference	NFPA 1600	NFPA 99
The plan must be based on a community risk assessment using an all-hazards approach with each separately certified facility within the health system having a documented individual facility based risk assessment	488.73 (F) 4 i		
Include integrated policies and procedures that meet the requirements set forth in paragraph (b) of this section, a coordinated communication plan and training and testing programs that meet the requirements of paragraphs (c) and (d) of this section, respectively	488.73 (F) 5		

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
Mandatory Immediate Notifications to NJDOH		
8:36-5.10	<p>(a) The facility shall notify the Department immediately by telephone at (609) 633-9034 or (609) 392-2020 after business hours, followed within 72 hours by written confirmation, of the following:</p> <ol style="list-style-type: none"> 1. Termination of employment of the administrator, and the name and qualifications of his or her replacement; 2. Any elopements; and 3. Any suspected cases of resident abuse or exploitation, which have been reported to the State of New Jersey Office of the Ombudsman for the Institutionalized Elderly. <p>(b) The written notification to the Department, as required by (a) above, shall be forwarded by the facility to the following address:</p> <p style="padding-left: 40px;">Director Long-Term Care Licensing and Certification Unit New Jersey Department of Health and Senior Services PO Box 367 Trenton, NJ 08625-0367</p>	
8:43E-10.11(b)	A facility licensed in accordance with N.J.S.A. 26:2H-1 et seq. shall notify the Department immediately of the types of reportable events described in (c) and (d) below	

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
8:43E-10.11(b)3	In the case of long-term care facilities, "immediately" means telephonic notification to the Department at (609) 392-2020 followed by written notification within 72 hours.	
8:43E-10.11(c)	<p>Examples of reportable events in the nature of physical plant and operational interruptions, include, but are not limited to, the following:</p> <ol style="list-style-type: none"> 1. Loss of heat or air conditioning; 2. Loss or significant reduction of water, electrical power, or any other essential utilities necessary to the operation of the facility; 3. Fires, disasters, or accidents that result in injury or death of patients, residents or employees, or in evacuation of patients or residents from all or part of the facility; 4. A labor stoppage or staffing shortage sufficient to require the temporary closure of a service; and 5. Notices of a potential strike that a facility receives from an employee bargaining unit. <p>i. The report shall be accompanied by the facility's plan to continue service operations in the event the strike occurs.</p>	

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
8:43E-10.11(d)	<p>Examples of reportable events in the nature of potentially criminal acts include, but are not limited to, the following:</p> <ol style="list-style-type: none"> 1. Any instance of care ordered by or provided by someone impersonating a physician, nurse, pharmacist, or other licensed health care provider; 2. Abduction of a patient or resident of any age; 3. Sexual assault on a patient or resident, staff member, or visitor within or on the grounds of a facility; and 4. Death or significant injury of a patient or resident, staff member, or visitor 	
8:43E-10.11(e)	A health care facility shall report incidents of infectious and communicable diseases to the Department pursuant to N.J.A.C. 8:57.	
Mandatory fire and emergency preparedness		
8:36-14.2(a)	The facility shall develop written emergency plans, policies, and procedures which shall include plans and procedures to be followed in case of medical emergencies, power failures, fire, and natural disasters. The emergency plans shall be filed with the Department and the Department shall be notified when the plans are changed. Copies of emergency plans shall also be forwarded to other agencies in accordance with State and municipal laws.	

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
8:36-14.2(b)	The emergency plans, including a written evacuation diagram specific to the unit that includes evacuation procedure, location of fire exits, alarm boxes, and fire extinguishers, and all emergency procedures shall be conspicuously posted throughout the facility. All employees shall be trained in procedures to be followed in the event of a fire and instructed in the use of fire-fighting equipment and resident evacuation as part of their initial orientation and at least annually thereafter. All residents shall be instructed in emergency evacuation procedures.	
8:36-14.2(c)	Procedures for emergencies shall specify persons to be notified, process of notification and verification of notification, locations of emergency equipment and alarm signals, evacuation routes, procedures for evacuating residents, procedures for reentry and recovery, frequency of fire drills, tasks and responsibilities assigned to all personnel, and shall specify medications and records to be taken from the facility upon evacuation and to be returned following the emergency.	
8:36-14.2(d)	Nothing in these rules shall supersede or imply non-compliance with the Uniform Fire Act or Uniform Fire Code, N.J.A.C. 5:70, or NFPA 101.	

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
8:36-14.3(a)	The facility shall conduct at least one drill of the emergency plans every month. The 12 drills shall be conducted on a rotating basis, to ensure that four drills occur during each working shift on an annual basis. The facility shall maintain documentation of all drills, including the date, hour, description of the drill, participating staff, and signature of the person in charge. In addition to drills for emergencies due to fire, the facility shall conduct at least one drill per year for emergencies due to a disaster other than fire, such as storm, flood, other natural disaster, bomb threat, or nuclear accident (a total of 12 drills). All staff shall participate in at least one drill annually, and selected residents may participate in drills.	
8:36-14.3(b)	The facility shall request of the local fire department that at least one joint fire drill be conducted annually. Upon scheduling a joint fire drill, the facility shall notify first aid and civil defense agencies of this drill and shall participate in community-wide disaster drills.	
8:36-14.3(c)	The facility shall test at least one manual pull alarm each month of the year and maintain documentation of test dates, location of each manual pull alarm tested, persons testing the alarm, and its condition.	
8:36-14.3(d)	Fire extinguishers shall be conspicuously hung, kept easily accessible, shall be visually examined monthly and the examination shall be recorded on a tag which is attached to the fire extinguisher. Fire extinguishers shall also be inspected and maintained in accordance with manufacturers' and applicable NFPA requirements and N.J.A.C. 5:70. Each fire extinguisher shall be labeled to show the date of such inspection and maintenance.	

NJDOH Regulations Regarding Emergency Planning & Preparedness for Assisted Living Residences

Regulation	Explanation	Document Reference
8:36-14.3(e)	Nothing in these rules shall supersede or imply non-compliance with the New Jersey Uniform Fire Safety Act, N.J.S.A. 52:27D-192 et seq. or Uniform Fire Code, N.J.A.C. 5:70.	
Mandatory Training for Staff Members		
8:36-5.6(b)2	The facility or program shall develop and implement a staff orientation and a staff education plan, including plans for each service and designation of person(s) responsible for training. All personnel shall receive orientation at the time of employment and at least annual in-service education regarding, at a minimum, the following: Emergency plans and procedures	