ABSTRACT

Title of Document:	**INTERAGENCY BABBLE: INSTITUTIONAL LOGICS AND INFORMATION FLOW IN CATASTROPHIC DISASTERS**
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Recent catastrophic disasters have highlighted the enormous human, economic, and material costs of information flow breakdown. This study explores how significant information flow problems in catastrophic disaster response arise from fundamental, but critical, differences in institutional logics among the collection of organizations that are involved. Documents will be analyzed using qualitative methodology to identify salient features of two of the institutional logics seen in disaster response and develop a framework relating the outcomes of the first responders' actions to the logic employed. This study identified the existing gaps in the publically-available accessible information about previous disaster response efforts and considers how this information can potentially be used to better understand the problems the United States faces in terms of effective disaster response. This study has the potential to inform policy makers and organizations within disaster response in crafting better ways of utilizing information to minimize loss of life and property.

INTERAGENCY BABBLE: INSTITUTIONAL LOGICS AND INFORMATION
FLOW IN CATASTROPHIC DISASTERS

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Masters of Library Science
2014

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1 Introduction

Emergency services across the United States effectively respond to an estimated 240 million 911 calls annually – fire, police, and medical emergencies. (NEMA n.d.) While this is a majority of the emergencies requiring assistance, this estimated number does not include the small percentage of emergencies in areas that do not use the emergency number 9-1-1 nor does it account for the emergencies that are happened upon by responders (such as a person walking into a fire department for help). The emergency response system is responsible for the planning of emergency response in their communities, efficiently receiving distress notifications, dispatching the appropriate type of responder with the appropriate equipment who will mitigate the emergency as per their protocols (a mix of local, state, and federal regulations, as well as standards of care as defined by the discipline), completion of all appropriate documentation, then for resetting the emergency units with all necessary equipment to the proper location in order to be able to respond to the next emergency. (Pre-Hospital Trauma Life Support Committee, 2003; AAOS 2010)

The complex system consists of many diverse pieces, which varies from locale to locale. (AAOS 2010; Pozner et al. 2004) Each emergency situation requires a mix of responders from the different disciplines. For some emergencies, only the fire department company or a police officer is needed to handle the situation. For others it can be complicated enough to warrant multiple fire department units, police units, emergency medical services (ground and/or air), or specialized units such as tactical units, hazardous materials specialists, or bomb disposal units. And within each type of response unit, there are different levels of trained professionals who can

handle different situations. In addition, within many locales there are multiple types of emergency response organizations, such as municipal, commercial, or volunteer, that need to coordinate and share information in order to provide service to the general citizenry. (AAOS 2010; Pozner et al. 2004)

Emergency response services in the United States is a loosely-coupled completely locally-based system. (AAOS 2010) Part of its effectiveness is that all responders are part of the communities they serve and are familiar with local resources. Trust is built between the individuals and on the organization level, which is key for maintaining high reliability in critical situations. (Weick 1987) Standard operating procedures and response plans are crafted on the local level, adhering to the more distant regulations as put forth by the state and federal government agencies. Having an emergency response system which is locally-based, complex and flexible, while being adaptable to whatever situation arises is essential for the level of effectiveness required in order to handle the diverse range of unexpected and chaotic incidents. (Pre-Hospital Trauma Life Support Committee, 2003) Coordination among multi-agency situations involves integrated information sharing and decision-making, with each agency having their own processes, types of information, applications, and technology. (Bharosa et al. 2010) Coordination must involve the sharing of pertinent information and this type of information system is particularly vulnerable when the situation is complex and chaotic.

There must be robust information systems in place prior to an actual emergency or disaster in order to have the chance of an effective and efficient response in situ. (Dearstyne 2007; Bharosa et al. 2010; Bravata et al. 2004) The

management and coordination of multiple responder units, agencies, supplies and evacuations involves the sharing of the most up-to-date information in order to make effective decisions. (Barthel 2012; Dearstyne 2007; Bharosa et al. 2010; Bravata et al. 2004) As an example, correct information about the emergency has to get from the people in the emergency situation to the person (usually a dispatcher) who will collect the information then send along the appropriate responders. The dispatcher also needs to know who and where the appropriate responders are, appropriate ways to reach them, and what the appropriate severity level the emergency requires. The responders need to acquire information about the situation before passing it along to other responders on the scene and to outside organizations that need to know (such as local hospitals, the power company, or other response units that need to be dispatched due size or severity of the emergency). The emergency is not concluded until the dispatching unit is updated that the responders are back in service and ready for the next emergency. (Pozner et al. 2004)

A small percentage of emergencies can be considered disasters. Disasters are "a low-probability but high-impact event that causes a large number of individuals to become ill or injured." (Institute of Medicine Committee on the Future of Emergency Care in the US Health System 2007, pp. 175) Disasters stretch the capabilities of the local emergency system (sometimes taxing the system to the breaking point) and the affected communities. (Quarantelli 2006; Institute of Medicine Committee on the Future of Emergency Care in the US Health System 2007) Disasters are referred to within emergency response communities as Multi-Casualty Incidents (MCIs) and are

when there are more victims that need assistance than there are first responders to help them. (AAOS 2010)

There are slightly different protocols when there is an MCI, and usually an MCI prompts an activation of the local Mutual Aid agreements. As an example, if a large building catches on fire, not only will the fire department(s) of the town respond but they will activate their Mutual Aid agreements and fire departments from surrounding towns will respond to assist in the firefighting. These agreements are made between individual organizations, so towns or counties that border each other will invariably have these agreements but towns on opposite sides of the state will not. (Bravata et al. 2004) In many cases, organizations that have mutual aid agreements will have cross-over trainings or meetings. Tis builds trust and familiarity on the organizational- and individual-level.

An example of disaster information flow was successful was the response to the bombing of the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma, on April 19, 1995. Emergency responders, government and non-profit responders were on scene within minutes of the explosion. (Moynihan 2009) And both the Regional FEMA Operations Center and the FEMA headquarters were activated within the hour, with Urban Search and Rescue Task Forces (US&R) deployed within two hours of the blast. (Bosner 2011) The response worked but it worked only because the Chief of the Oklahoma City Fire Department was a skilled commander and maintained command and control of the scene completely, directing all response efforts (which was actually not per the accepted protocols of the time). (Moynihan 2009) In contrast, the response to the Twin Towers in New York City after the

terrorist attacks of September 11, 2001, is widely acknowledged as an example of a broken disaster response information flow. The information that was available to responders and unit commanders was hard to understand and make sense of, was conflicting and difficult to interpret, and there was false information, all of which led to a series of events resulting in hundreds of responder deaths. (Dearstyne 2007)

The emergency response system is a loosely-coupled network which significantly varies from locale to locale. Despite all the complexity and challenges that a system like this faces, it needs to be ready at any time of every day to deal with the complete gamut of emergencies, and for the most part it reliability works to protect and save citizenry.

1.1 Information and Catastrophic Disasters

A catastrophic disaster is a disaster on a larger scope, whereas a large geographical area is severely impacted. The increase in size and severity means that there will be a need for a greater number of first responding agencies and a greater number of types of responders needed. (Quarantelli 2006) The increase in scope changes what is needed for adequate planning, response, and recovery. Since the normally-operating emergency response system functions on a local level, the increase in scope during a catastrophic disaster means the normal system can no longer function effectively. (Pretto & Safar 1991) Resources (including those needed for response, transportation, and evacuation) need to be shared and coordinated over a much larger area. This means an effective information flow is even more crucial for responders to be effective in performing their jobs. (Bharosa et al. 2010)

In Quarantelli's (2006) discussion about the differences between disasters and catastrophic disasters, he hypothesizes that there are four main organizational differences: (1) organizations have to deal with and exchange critical information with many other organizations most of whom they are unfamiliar with, (2) personnel and organizations lose autonomy and freedom of action as opposed to what they are used to during normal activities, (3) different standards of performance are applied, and (4) public and private sector organizations need to interface much closer. (Quarantelli 2006) In addition there are differences between the two that are seen not only at the organizational level but also at the community and societal levels: (1) community infrastructure is heavily impacted which includes the emergency organizations' facilities and equipment, (2) outside people will need to assume leadership roles when local officials are unable to do so due to death or impairment, (3) assistance cannot be provided by nearby communities since they are all affected by the catastrophe, (4) most or all of the normal function of the communities is interrupted, (5) mass media socially constructs catastrophes more than disasters, and (6) the different layers of politics needs to directly interact and share information for decision-making. (Quarantelli 2006)

These types of events have different needs and require different types of planning. The personnel from the types of organizations that are involved with planning for a catastrophic disaster includes the emergency response agencies but also governments on multiple levels, schools, hospitals, utilities, transportation agencies, non-profit aid organizations such as the Red Cross, and advocates for disadvantaged populations. (Holguín-Veras et al. 2007; Quarantelli 2006) The

challenges inherent in responding to catastrophic disasters and designing an effective response system arise from the inherent characteristics of catastrophic disasters and how they differ from normal emergencies.

Coordination among the network of responding organizations and their smaller response teams is critical during catastrophic disaster response. (Barthel 2012) As an example, during the initial response to the terrorist attacks in New York City in 2001, firefighters were ordered to enter the second World Trade Tower to assist in evacuation of personnel. But due to communication breakdowns, not all of the firefighters received the order for immediate evacuation and the results were that some firefighters were trapped for an extended period of time and some firefighters were killed. (Dearstyne 2007) Information flow can be helped or hindered by a variety of factors such as technology, language, abbreviations, effective leadership, and pre-determined methods of communication. (Rowan 1991; NSTAC 2007; Bharosa et al. 2010) In addition, coordination efforts between the differing organizations involved in disaster response are complicated by the diversity of organizations involved since each organization has its own methods of communication (including colloquial short-hand), purposes, policies, procedures, and expectations of duties.

There has been an increase seen in the past several decades of the rate of occurrences of catastrophic disasters. The reasons for the increase that have been hypothesized include the increasing population density, change in overall climate patterns, and a hostile political climate that is producing large-scale terrorist attacks. There has been an increase in population density, especially in the coastal United

States regions, with the consequences being a greater loss of life and property damage. (Ross & Lott 2003) There has been an increase in severe weather patterns around the world over the past fifty years as the global climate has shifted. (Smith & Katz 2013; Institute of Medicine Committee on the Future of Emergency Care in the US Health System 2007) There has also been an increase in man-made terrorist attacks world-wide, including bombings, chemical attacks and biological agent attacks. (Institute of Medicine Committee on the Future of Emergency Care in the US Health System 2007) In the United States, some of the recent catastrophic disasters include the terrorist attacks of September 11, 2001, the gulf hurricane season in 2004-2005 (which included Wilma, Rita, Katrina and Dennis), and Superstorm Sandy which battered the east coast in October of 2012. Just these three series of events caused over 5157 fatalities and cost over $298.3 billion in direct response and recovery. (National Climatic Data Center (NCDC) n.d.; Looney 2002) To mitigate the effects of catastrophic disasters on the population, communities, and infrastructure there must be an effective catastrophic disasters response system that has a reliable and resilient communication system inherent in it.

Per the Disaster Relief Act of 1974 and amended in 2007, the United States Congress has decreed that in the US, the federal government is responsible for the planning and preparing for future disasters, responding to disasters as they occur, and recovering and rebuilding after the immediate dangers have passed by providing the systems, processes, and funding. (42 U.S.C. §§ 5121-5206) As of such, the Federal Emergency Management Agency (FEMA) was created in 1979 and it was an independent agency until 2003. FEMA was a cabinet-level agency from 1996 to

2003. (GAO 2006) The agency was plagued by neglect and scandal from its

inception until two hurricanes battered the United States (Hugo in 1989 and Andrew

in 1992) and there was an extensive public outcry. (Bosner 2011) After that there

was a shift in the administration and FEMA was re-built to be more effective,

responding to disasters such as the Oklahoma City Bombing in 1995 and developing

the Federal Response Plan in 1992. (Bosner 2011; DHS 2013) The Bush

Administration came into office in the beginning of 2001 and worked to deconstruct

FEMA. (Bosner 2011)

On September 11, 2001 a series of massive unexpected terrorist attacks hit the

United States. With virtually no federal-level leadership, the local emergency

services did the best they were able to given the situation they faced. The emergency

response to these attacks exposed the flaws and breakdowns inherent in this

ineffective system. (Institute of Medicine Committee on the Future of Emergency

Care 2006) "We all talk about our careers as before September 11th and after

September 11th, and it's been totally different. It certainly has changed the way we

do business…" stated FDNY Fire Commissioner Salvatore J. Cassano (McCallion &

Heightman 2011). The immediate result of the attacks in New York City alone was

the deaths of 3,045 people including 441 first responders. (National EMS Memorial

Service 2007; Statistics Brain n.d.) No emergency situation should ever result in the

deaths of first responders, this is an unacceptable failure.

The 9/11 Commission, an independent bipartisan commission created by

congressional legislation, stated that there were systematic failures that caused the

poor catastrophic disaster response. (9/11 Commission 2004) Their main critiques of

the emergency response system were that: the 9-1-1 dispatch agencies were not

adequate and not integrated into other parts of the system, there was no unified

incident command, there were no integrated communications, there was no

accounting of units or knowledge by commanders of where they were, there was no

coordination among the various responder units, there was internal communication

breakdowns, there was a lack of standard operating procedures among tertiary

responders (i.e. Port Authority), there was a lack of communication and coordination

among responders in their efforts to search and evacuate the Twin Towers, and the

communication equipment did not work. (9/11 Commission 2004) The Commission's

recommendations included creating a universal response plan with clear command

and control structures with appropriate processes and developing a common inter-

agency training system to foster building trust. (9/11 Commission 2004)

As a result of the events of 9/11/01, FEMA was subsumed into the newly

created Department of Homeland Security (DHS) in March 2003. (GAO 2006) DHS

was then responsible for taking these findings and recommendations and making a

system that worked in catastrophic disaster response. (GAO 2006) FEMA, as part of

DHS, decided to address these issues with two major initiatives: funding for

communication equipment and the creation of the National Incident Management

System (NIMS). The funding initiative was for agencies of all sizes to increase their

capabilities to communicate with nearby agencies and funds were distributed as a

grant program to those agencies that put in an acceptable proposal. (Walsh et al.

2005) The purpose of this new NIMS was to:

> "integrate the best existing processes and methods into a unified
> national framework for incident management. This framework

forms the basis for interoperability and compatibility that will, in turn, enable a diverse set of public and private organizations to conduct well-integrated and effective emergency management and incident response operations. It does this through a core set of concepts, principles, procedures, organizational processes, terminology, and standards requirements applicable to a broad community of NIMS users." (DHS 2008, pp. 5)

NIMS consists of five major components: "Preparedness, Communications and Information Management, Resource Management, Command and Management, and Ongoing Management and Maintenance." (DHS 2008, pp. 7) This complex system, with an emphasis on jargon, abbreviations, and intricate role titles, was designed to be used by every single agency in every single emergency response in every single level of response (local, state, tribal, federal) and was implemented in 2004. (Walsh et al, 2005) The information flow was to be fixed by having detailed hierarchical structures and reporting standards at every phase of a disaster response. (See Figure 1) (For a further discussion of NIMS and its development, please see Appendix B.)
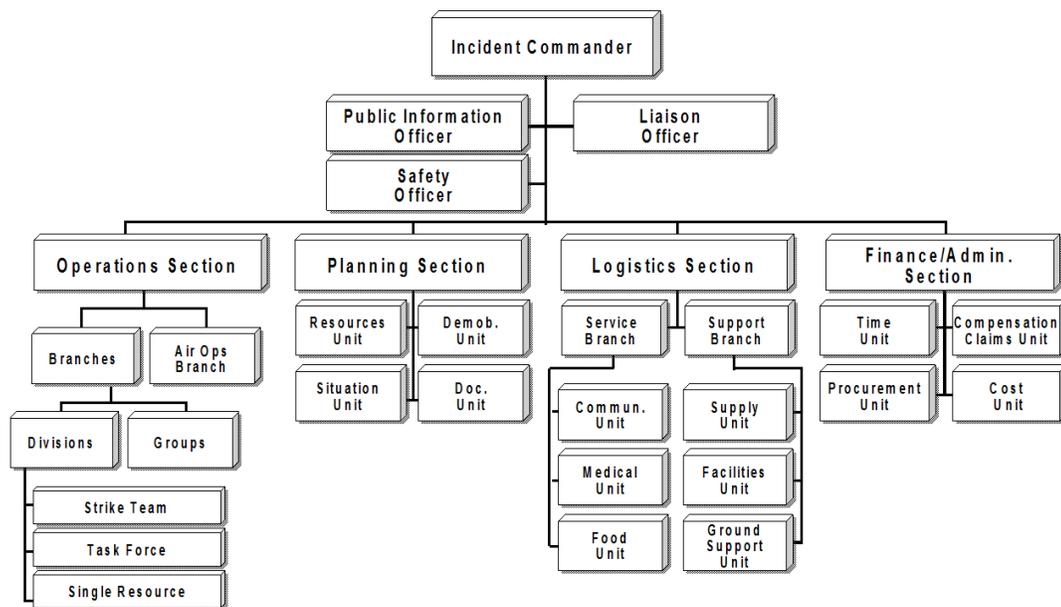
Figure 1: Diagram of the NIMS structure in a disaster

In addition, about $41 billion was appropriated by Congress (in fiscal years 2002-2012) to increase the capabilities of state and local governments to deal with major disasters, including implementing NIMS. (GAO 2013) The national implementation of NIMS was seen by FEMA and DHS as the mechanism to fix all the information flow break-down (collaboration, coordination, and communication) exposed in the 9/11 Attacks and was successfully implemented. (National Incident Management System 2004; Walsh et al. 2005; Anderson et al. 2005) FEMA announced the implementation of NIMS to the emergency response community along with the accompanying decree that all emergency agencies who received federal funding to have at least 80% of their employees become "certified" in NIMS by completing online training modules. If all of these efforts were effective and successfully implemented, then there is an expectation that the next catastrophic disaster response would run smoothly with little unnecessary death or destruction.

1.2 Context

In August 2005, Hurricane Katrina made landfall in southeastern United States as part of a brutal hurricane season, which included Hurricanes Dennis, Emily, Rita, and Wilma. (NCDC n.d.) Katrina caused over 1,833 deaths, affected over 90,000 square miles, and prompted mass evacuations from five states displacing at least 600,000 households. (GAO 2006; NCDC n.d.) The overall damage from Katrina is estimated to be $148.8 billion. (NCDC n.d.) The federal emergency response of FEMA and DHS to Katrina has been seen as a failure in every way despite all the changes and funding enacted by DHS after 9/11. (Fischer et al. 2006; Bosner 2011; Democratic Staff of the House Committee on Science 2005)

1.3 Research Question

The question that will be explored in this study is: why do inter-organizational information flow break-downs persist within the planning and response to catastrophic disasters? Specifically, the premise of this study is that significant information flow problems in catastrophic disaster response networks arise from fundamental, but critical, differences in institutional logics among the collection of organizations that are involved in catastrophic disaster response. Institutional logics are "the organizing principles that shape the behavior of field participants" and "they define the content and meaning of institutions." (Reay & Hinings 2009, pp. 631) Different fields or types of organizations, such as a federal government agency or bureaucracy, will have differing institutional logics that guide the beliefs and actions of the individuals in the organizations. (Reay & Hinings 2009) This study examines the claim that while this difference is implicitly known, the failure to systematically understand it, exacerbates information flow problems and reduces the impact of efforts to address them.

1.4 Summary and Chapters Ahead

This study will focus on the planning and response to Hurricane Katrina in the New Orleans, LA, area. This particular catastrophic disaster was chosen because of the scale of the event in terms of geography, amount of morbidity and mortality, and the amount of overall damage. The timing of Hurricane Katrina allows the examination in situ of the usage of FEMA's newly implemented NIMS protocols. There is also a rich corpus of government and official reports and academic literature concerning this event produced in the past nine years. The response in New Orleans

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was focused upon because of its limited geographical area, the impacts of the hurricane and subsequent levee breakage with flooding, and the availability of publically-available data.

The first section of this paper will examine the events and circumstances of Hurricane Katrina, focusing on the New Orleans area. In the next section, a discussion of the study methodology will be presented with the findings following. Then the next section will be an exploration of the theory of institutional logics, with the focus being on two institutional logics that are consistently present in catastrophic disaster response systems: bureaucracies and High-Reliability Organizations (HRO). These coexisting institutional logics will be compared with the goal of identifying how differences between them might lead to problems with coordination and information sharing. This study will conclude with a look at potential implications for disaster professionals and organizations and future directions for research.

2 Hurricane Katrina

A year before Hurricane Katrina made landfall, FEMA decided to run a joint-training session that presented the situation of a major hurricane hitting New Orleans. The purpose of the "Hurricane Pam" exercise was to develop the best plan should the very real possibility of this type of catastrophic disaster to happen. The simulation included the contracted consulting firm who was running it, FEMA representatives, State of Louisiana officials, representatives from the Corps of Engineers, New Orleans officials, Louisiana State University hurricane experts, and an observer from the White House. (Democratic Staff of the House Committee on Science, 2006) The plan was never finished due to funding issues. In the draft report (which was available to government officials prior to Katrina), it was stated that the planning showed there would be an estimated 100,000 citizens who would not have transportation to evacuate, there would also be over 60,000 fatalities, and that there would be over 380,000 injured or ill citizens. (Democratic Staff of the House Committee on Science, 2006) The Democratic Staff of the House Committee on Science (2006, pp. 25) stated in their report about the response to Katrina, "with that as the backdrop for Katrina, one would expect that the Federal response would have been massive and aggressive."

Hurricane Katrina was the costliest and one of the five deadliest hurricanes to ever hit the United States. (Knabb et al. 2005; NCDC n.d.) Katrina was especially well-tracked and accurately predicted by the National Weather Service (NWS). (Democratic Staff of the House Committee on Science, 2006; Knabb et al. 2005)

(See Figure 2 to see a picture of Hurricane Katrina's relative size.) NWS's

abbreviated timeline of Katrina as presented in the report by the Democratic Staff of

the House Committee on Science (2006):

Tuesday, 8/23/05	- Katrina forms as a tropical depression near Nassau in the Bahamas (the 12th tropical depression of the Atlantic season) - Advisory issued for a watch in southern Florida
Wednesday, 8/24/05	5-day forecast puts Katrina's path in Gulf of Mexico - Katrina is elevated to a Tropical Storm - Tropical Storm Katrina advisory is issued for southeast Florida coast
Thursday, 8/25/05	- Katrina elevated to Hurricane 1 level - Makes landfall as Hurricane 1 in Florida
Friday, 8/26/05	- Katrina enters of the Gulf of Mexico as a tropical storm - Katrina elevated to Category 1 hurricane level - Katrina is elevated to Category 2 level - Hurricane Katrina advisory issued warning of strengthening of storm to become Hurricane 3 level for the next day 4 pm CDT Advisory issued - Katrina shifting more westward to be closer to MS coast with the potential of New Orleans in the impact area and gaining more strength to be a Level 4 10 pm CDT Advisory issued – estimated landfall is over or near New Orleans; projected intensity at Category 4 or 5. (**Advisory issued 56 hours prior to landfall**.)
Saturday, 8/27/05	- Katrina elevated to Category 3 hurricane - Hurricane Warning issued for the north central Gulf Coast. Prediction of storm surge flooding 15-20 feet, with potential of 25 feet in some areas.
Sunday, 8/28/05	- Katrina elevated to Category 4 hurricane - Katrina elevated to Category 5 hurricane - Advisory issued – Katrina as "potentially catastrophic" hurricane or "extremely dangerous" - Advisory issued – "Some levees in the Greater New Orleans could be overtopped"

Monday, 8/29/05	▪ Katrina downgraded to a Category 4 hurricane ▪ 6:10 am CDT Made landfall in southeastern LA as Category 4 ▪ 10:00 am CDT Made second landfall at LA/MS border as Category 3 hurricane
Tuesday, 8/30/05	▪ 10 am CDT Katrina downgraded to tropical depression 25 miles south of Clarksville, TN

As a note, NWS did issue advisories as every conclusion was reached and when the probability of the models increased. NWS also followed protocols by informing the necessary state and federal government officials, including the President of the United States and other senior government officials. (Democratic Staff of the House Committee on Science, 2006)
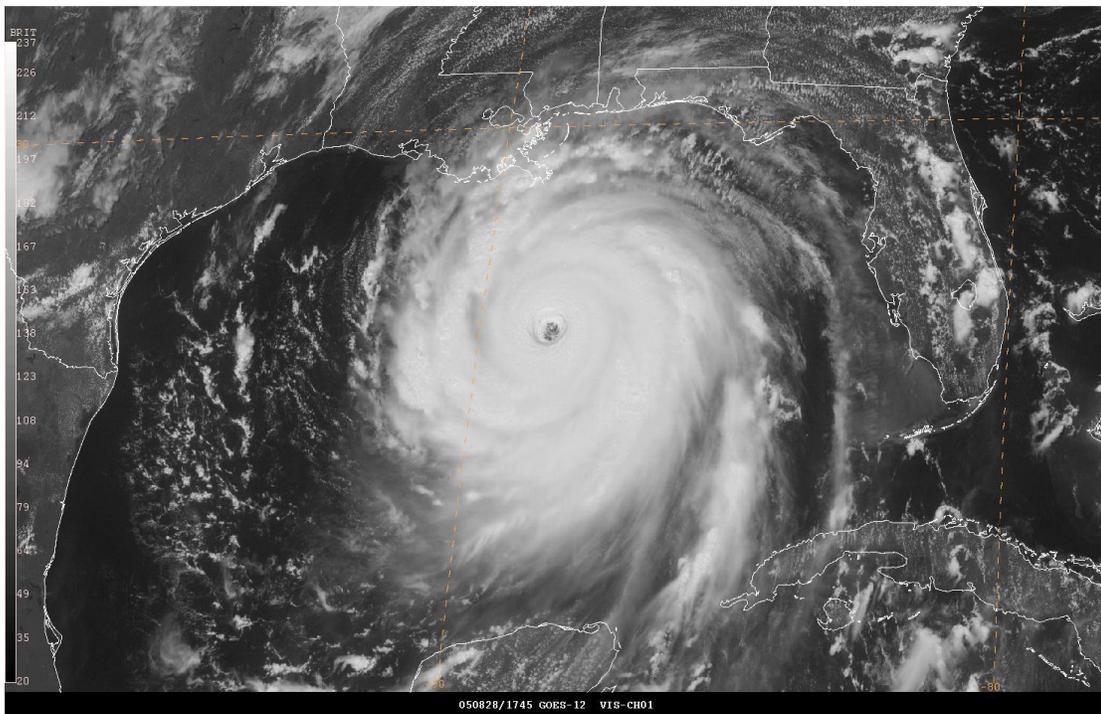

Figure 2: Picture of Hurricane Katrina over the central Gulf of Mexico at 12:45 pm CDT August 28, near the time of its peak intensity. (Knabb et al. 2005)
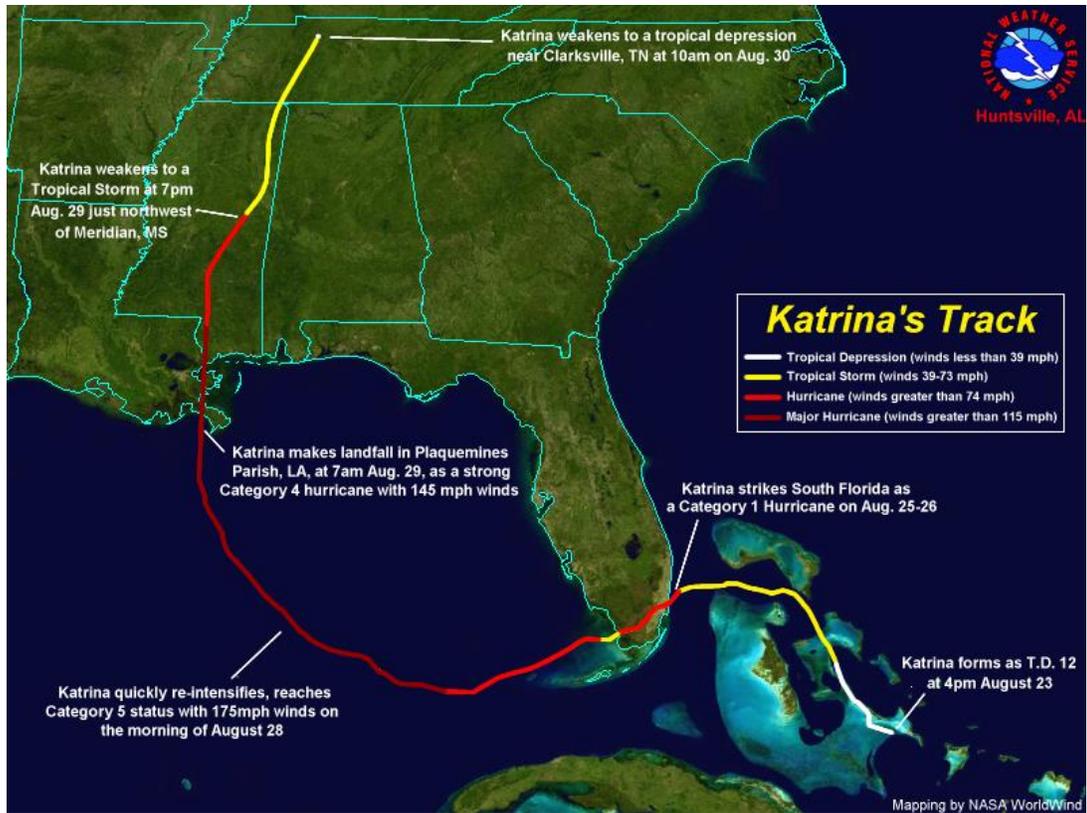
Figure 3: Katrina's track through the southeastern United States (National Weather Service, Weather Forecast Office Huntsville, AL 2013)

As of 4:00pm CDT on August 26, 2005, the National Weather Service's National Hurricane Center predicted that Hurricane Katrina's track had shifted and would now make landfall in the southeastern section of Louisiana (which includes the New Orleans metropolitan area). (OIG 2006) (See Figure 3 for a diagram of Katrina's pathway) Officials in the southeastern states were in contact with the staff at the National Hurricane Center throughout the entire situation and activated their states' Regional Response Coordination Centers. (Democratic Staff of the House Committee on Science 2006; OIG 2006) Federal emergency declarations were issued for Louisiana on August 27, 2005 and for Mississippi and Alabama on August 28, 2005. (OIG 2006) Despite all of the advanced notice, the mandatory evacuation of New Orleans was not ordered by Mayor Ray Nagin until Sunday, August 28, 2005 at 10:00

am CDT due to the State Evacuation Plan that states that the mandatory evacuation should not begin prior to 30 hours before landfall in order to not clog the evacuation routes. (Fischer et al. 2006; Democratic Staff of the House Committee on Science 2006) The was the same day that Mississippi also declared an evacuation and since New Orleans only has two highways leaving the city and one of them is through Mississippi, the evacuation was slower than anticipated. (OIG 2006) An estimated 1.4 million people did evacuate from New Orleans. (Fischer et al. 2006)

The vulnerability of New Orleans to any severe storm due to its precarious geography has been well known in every level of the American Government. (Democratic Staff of the House Committee on Science 2006) In addition, New Orleans has been hit by a range of hurricanes over the last century: Hilda in 1964, Betsy in 1965, Camille in 1969, Georges in 1998, and Ivan in 1999, which has highlighted the continual susceptibility of the city. (Democratic Staff of the House Committee on Science 2006) Although there was no comprehensive disaster response plan for the city or the combined response agencies, the New Orleans Fire Department had instituted an internal plan several years prior, which allowed firefighters to effectively rescue thousands of citizens and combat the fires that sprung up. (Hampton & McConnell 2006) Part of that plan was to station a fire squad on a high-rise near the waterfront in order to keep an eye on the levees, and they were able to watch the major levees break as it happened and report to other fire department units. (Fincher oral history 2006) This allowed the local units to quickly acquire boats to deal with the flooding. (Hampton & McConnell 2006) By the time Katrina had passed and all the levees broke, 80% of the city was flooded, with the

average amount of water being 6-8 feet. (See Figure 4 to see the areas of flooding

and how deep the flood waters got in the different parts of the city.)
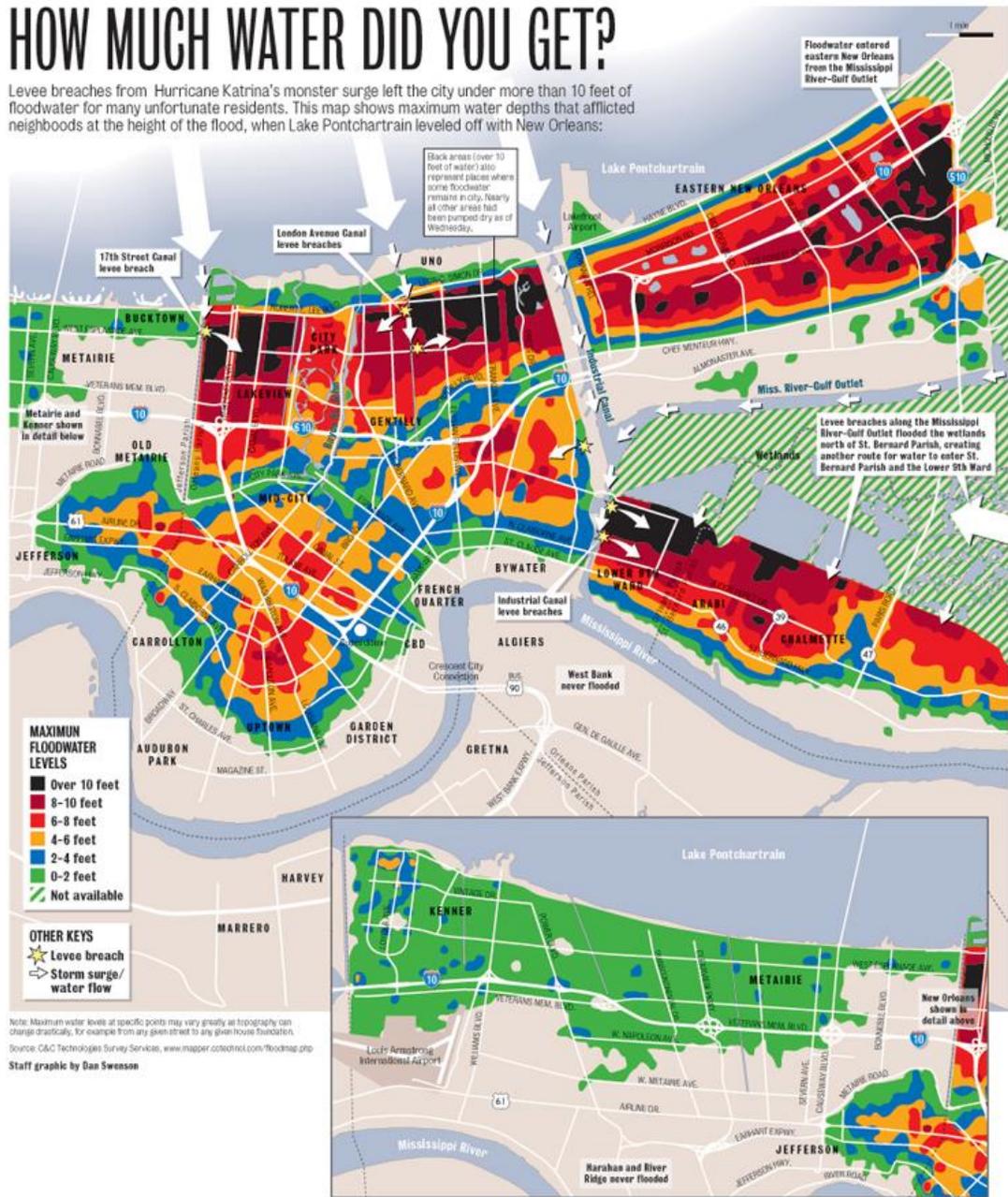
Figure 4: Map of the flooding with water depths of New Orleans. (Swenson 2014)

3 Institutional Logics

An Institutional Logic will develop and perpetuate because it offers benefits to the organization, individuals, and the larger environment it operates in. In situations where there are co-existing Institutional Logics, collaboration and competition are the two main ways the interactions play out. (Reay & Hinings 2009)

> "Thornton and Ocasio (2008) define an institutional logic as the socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences."(Thornton et al. 2012, pp. 2)

Institutional logics provides a metatheoretical framework that can be used to examine the relationships between individuals, organizations, and fields. (Thornton et al. 2012) This perspective takes into account such social systems and norms as decision-making ability, status, authority, definition of organizational success/failure, vocabulary, as well as other features that are present in every organization. Of the many Institutional Logics seen in agencies that are key to catastrophic disaster response, two that will be explored further are the Bureaucratic and the High Reliability Organizational Logic.

As discussed by Adler (2012), a bureaucracy's defining features are "the extensive formalized and standardized procedures, complex structures of specialized roles and departments, differentiated vertical hierarchy and centralized policy making, and substantial staff departments" (pg. 246). The prime example of a bureaucracy is the United States Federal Government and all its sub-agencies and departments, including FEMA and DHS. A benefit of the bureaucracy's hierarchical

structure is that it facilitates an organizational competence that allows essential functions to be carried out no matter the personal knowledge or competence of individual people in the organization. (Adler 2012) Authority and decision-making are given to individuals based upon their role, not their personal skills or knowledge. Bureaucracies are ideal at running complex systems that do not require continual quick reactions. This primary benefit aids the federal government as it administers the large and complex functions that it is required to do for its effective continuation, which includes providing oversight, response and relief, and funding in catastrophic disasters. (McCarthy & Brown 2013)

In order to enact change within a bureaucratic Institutional Logic, the leaders (those in leadership roles within the organization based on title and authority) will change the formalized documents that operator behavior is based on, such as Standard Operating Procedures, strategic plans, and written processes. The notification of such changes will be in formal written communiques, such as memorandum. So when FEMA and DHS were charged with fixing the disaster response system after 9/11, they crafted NIMS which included hierarchical structures, formal reporting requirements, and intricate roles. FEMA created written online training modules for responders to be trained on the changing system (and the original modules had little or none audio-visual components such as pictures or videos and were written as a SOP manual). They informed the emergency response agencies who would need to use the system via writing. The mechanism DHS used in order to get compliance with the new program was to tie a measurable outcome (i.e. 80% of an agency's employees would need to have passed a minimum number of the online modules) to

the leverage they had with the agencies (i.e. if there was not compliance, federal funding would end).   All of these potential solutions and methods of communication were used because of the Bureaucratic Institutional Logic that FEMA and DHS have. Within their Logic, all of these efforts and changes would be successful and that was the anticipated result. Unfortunately, the agencies that FEMA was dealing with have a competing Institutional Logic that is radically different from a Bureaucratic Institutional Logic.

Emergency response agencies operate within the High-Reliability Organizational Institutional Logic. A High-Reliability Organization (HRO) is a particular class of organization that has evolved in situations where the potential for normal errors has catastrophic results, such as loss of life or property. (Weick, 1987) There are five major characteristics of HROs as postulated by Weick and Sutcliffe (2007) which distinguishes how they operate differently in comparison to other types of organizations, HROs have a: preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to reliance, and deference to expertise. Common examples of places to find HRO teams within the literature are nuclear submarines, air traffic control, firefighting, nuclear power plants, deep-sea oil well platforms, and emergency medical services (EMS). (Weick and Sutcliffe 2007; Bierly & Spender 1995; Klein et al. 1995; Weick 1993; Raslear 2006; Roberts et al. 1994; Rochlin et al. 1987; Van Stralen & Mercer 2013) One of the defining traits of HRO, no matter the field, is that all operators have a highly-developed situational awareness that is coupled with on-going sensemaking. This means that all actions are based primarily on what the current and anticipated situation calls for, not what is

written in a policy manual, which allows for rapid adaptation to handle chaotic, wildly fluctuating, potentially-dangerous situations.

In order to enact change within an HRO Institutional Logic, a compelling narrative needs to be adopted and disseminated. It is well-known within the emergency response community that information is shared primarily through the use of personal narrative or story-telling. (Weick et al. 1999) Even formal trainings must involve an element of narrative, so usually at the beginning of a training session, there will be a real-life vignette of an applicable situation presented, which is then referred to periodically throughout the training, until the end when a conclusion with the outcomes of that situation is used as a conclusion. If there is a sufficient reason given with a compelling narrative (which promotes the buy-in of the responders) the subsequent change can be quick. As an example of change within the EMS community, medical protocols change rapidly, with equipment and protocols being abandoned as new best practices are developed. Work-arounds are developed on an individual basis then shared widely through the use of stories. Often times, the work-arounds become formal procedure or protocol after being used in the field for an extended period of time. As an example, the American Heart Association changed the guidelines for Cardio-Pulmonary Resuscitation (CPR) in 2010 to be focused primarily on chest compressions and not on artificial respirations. (AHA 2010) While within the EMS field, this practice had been going on for more than a decade. Understanding each individual Institutional Logic is instrumental before comparing them to understand direct interactions.

Co-existing Institutional Logics becomes a functional issue when there is a need to maintain each separate Logic while still having direct interactions. The effects are even more severe when agencies and individuals in one Logic need to depend on the agencies or individuals of another Logic or when there are interactions for prolonged time periods. Co-existing Logics tend to have one of two kinds of mechanisms in these situations: complimentary or competing. An example of complimentary Institutional Logics is during the DMAT's deployment, their FEMA representative had no maps and no sense of how to get the team to the Superdome (which was his primary job on this leg). So one of the DMAT members, Richard Brown, went to the local bookstore in Houston right before they left for New Orleans and bought all the maps he could find of the New Orleans area. He then gave the maps to his team and to the FEMA representative. In this example, the HRO operator was able to adapt and problem-solve within the situation he found himself, then shared with the Bureaucratic operator, who could then do his job more effectively.

An example of competing Institutional Logics during the Katrina response was when two emergency physicians, one being Chris Najberg, and an ambulance company showed up at the FEMA outpost at New Orleans to assist in the rescue efforts. The FEMA representative sent them away and said that it was more of a hassle to use them then to ignore them because the official operating procedures/structure did not easily allow extra units or individuals to be added into the response efforts. Per the perspective of the Bureaucratic operator, the rules could not be bent to allow these actions. Per the perspective of the HRO operators, this was a travesty which negatively impacted the potential patients they could be saving. In

this example, both sides were negatively impacted by the clash of Logics. If the

Logics were better understood, then operators could be better trained and procedural

manuals could take this additional information into account.

4 Methods

The proposed methodology for this qualitative study was to examine a variety of formal and informal documents about the planning and response to Hurricane Katrina in New Orleans. It was important to look at different types of accounts of the events surrounding Katrina in order to better understand what actually happened and the reasoning underlying the actions of the responders. The charged political atmosphere and intense media focus created a climate of blame, finger-pointing, and presenting the best possible spin on all aspects. Documents were collected including the transcripts of oral histories of 23 first responders detailing their experiences. A coding scheme was developed to parse and analyze the oral histories. The reality of the available documents and information was quite different than anticipated. The data analysis schema was altered in terms of the unit of analysis and coding categories to be able to explicate the inherent themes in the accounts. The limited nature and lack of transparency of the publically-available information has limited the effectiveness of study in this area. In order to understand the planning and response to catastrophic disasters to be able to enact effective policy, there needs to be better information offered to the public and researchers in accessible formats.

A variety of documents from the federal government and the first responders were used to identify patterns of operator behavior. The following list is of the types of documents that were examined in this study.

- Training materials and Standard Operating Procedures:
- After-action reports from responding agencies
- Reports from FEMA and DHS concerning planning and response,

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- Government Accountability Office (GAO) reports concerning the response efforts, specifically about FEMA's response
- Congressional hearings and reports concerning Hurricane Katrina,
- Academic writing and analyses, specifically in the academic disciplines of: emergency medicine, disaster management, public health, social psychology, organizational science, business – management and logistics, public policy and administration.
- Oral Histories of Katrina first responders

The formal documents were broken into two categories: training materials and standard operating procedures (SOPs), and after-action reports. The training materials and SOPs were examined primarily as a way to understand the two institutional logics, FEMA's bureaucratic logic and the first responders' High-Reliability Organization (HRO) logic. The result of the analyses was a structure that can be used to evaluate the behavior of first responders in the Katrina response. The behavior was looked at to understand which institutional logic the responder was operating from: bureaucratic, HRO, or mixed. The NIMS, as put forth at the time of the Katrina response, was the primary set of documents looked at to understand FEMA's bureaucratic institutional logic. The HRO institutional logic was distilled from the other training materials and standard operating procedures. The after-action reports were used to provide context to the situations and offer further insight into the hypothesized competing logics.

The transcripts of oral histories of first responders were the primary data analyzed to ascertain the behavior and underlying HRO institutional logic during the planning and response to Hurricane Katrina. The transcripts were all captured by oral history initiatives in the two years after Hurricane Katrina. Using the principles of grounded theory, as expounded by Miles & Huberman (1994), the responder accounts were examined for general themes. The research plan was to parse the oral history

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accounts to the level of incident, with an incident being a discreet episode with a start

(i.e. 911 call or coming across a person in need) and an end (i.e. dropped off patient at

facility or transferred care to another). The predicted incidents that would be

considered for this study were ones with either the outcome was clearly identified or

had an outcome that could be identified using corroborating reports. The plan also

called for each incident to be coded as to the role of first responder (Emergency

Medical Services, Fire, Rescue, body recovery/mortuary, transportation, or

administration), type of episode (rescue or medical – illness or injury), outcome

(negative or positive) and type of institutional logic employed (bureaucratic, HRO or

mixed). The anticipated coded incidents would be the analysis dataset that would

undergo further analyses.

There were 23 oral histories specifically from the New Orleans area that were

analyzed for this study, each history was between 20-60 pages long. (See Appendix A

for the full details of the Oral History accounts.) Each interview was conducted by

the Historic New Orleans Collection's Oral History Initiative staff. The three main

groups of responders that were in this subset of the collection: New Orleans

Emergency Medical Services (2 histories), New Orleans Fire Department (7

histories), and the California 6 Disaster Medical Assistance Team (DMAT) (14

histories). (The function of a DMAT is to be a deployable self-sufficient unit, meant

to be sent anywhere in the United States to render emergency medical care in

response to a disaster situation. This team was deployed from California and was

stationed right next to the Superdome in New Orleans.)   The anticipated results of

this qualitative analysis were to be a collection of quotes that pertained to the first responders' incidents, actions, and their perceived understanding of the situations.

The proposed study was crafted with the knowledge that there are limitations to using the documents selected. The formal documents are extremely processed and edited to present a particular story from that organization. The authorship may not be directly known and the documents may be written by individuals not directly involved with the response efforts. Due to the focus of most of these reports, the response to Katrina is not detailed at the level of an incident, rather they look at the broader strokes of the entire event. And it is in the details that the evidence of the institutional logics will be observable.

There are also limitations with using an oral history collection of this age that was collected by individuals with little background knowledge of emergency response. The interviewer was a layperson, so technical jargon was not utilized by the responders. This jargon would have been a useful indicator of institutional logics because each logic has its own vocabulary. The majority of histories that were accessible (not under a 25-year gag order) may not have been of the key players who would have the insights into the response operations. The oral history interviews covered general events and since they were completed years ago, further probing cannot be used, unlike during present-day interviewing. Another limitation is that the majority of these accounts come from first responders who were in the field and not in the command centers, meaning that they would have a limited perspective on the larger-scale incidents.

When the data was examined after collection, the original research plan could not be completed due the content of the documents. The formal documents (training materials, standard operating procedures (SOPs), and after-action reports) did showcase the bureaucratic institutional logic. Interestingly, they all had the same focus and assumptions no matter the author-agency or the purpose of the report. All the reports and documents focused solely on the efforts of the federal agencies, with little mention about the state governmental response, and no mention of any local agencies or non-governmental organizations (NGOs). No credit was given to any person, agency, or type of agency that was not a federal-level agency. Certain key documents from FEMA were also no longer available to the public (despite the same report being available pre- and post-Katrina).

The oral histories of first responders, as informal reports, were different than anticipated. Only a subset of the collection was available, the rest were under a 25-year long suppression order, per the request of the first responders (they feared repercussions such as losing their jobs if they were honest publically). This means that the suppressed accounts may be more explicit in their accounting of what happened. The collection of Historic New Orleans Collection's Oral History Initiative is the sole collection of its kind, no others have collected first responder accounts. These narratives were in a broken chronological order, not in complete incidents as was expected. Most of the themes emerged on a sentence-basis not a story-basis. And the original coding scheme could not be used since there were few discreet incidents that were identifiable and most did not have clear outcomes. The role of the first responder was not always clearly identifiable nor the type of episode.

And there was only one type of institutional logic that the responders operated under, HRO logic.

An interesting observation of the oral history analysis was that the anticipated 23 different accounts were not actually that different. The entire DMAT team experienced the exact same events over the course of their deployment, with few variations. So all of their narratives tell the same story from a slightly different perspective. The fire fighters also had a very consistent narrative. Even though they were in different parts of the city and were dealing with different situations, their responses were all uniform. They all acted as if they were in direct communication. The two EMS histories were radically different, one being an Emergency Medical Technician (EMT) working without an ambulance or any support and the other being an Emergency Department physician resident (who also worked as an EMT) who had a different level of autonomy than the first EMT.

A second type of informal report was found in the course of research, an insider's published account. The first was a FEMA insider who gave a history of FEMA and shared his experiences working through Katrina in FEMA headquarters. (Bosner 2011) The second was an unofficial report written by two New Orleans firefighters of the NOFD response. (Hampton & McConnell 2006) (The official after-action reports on the state or local levels are not readily available.) Since these reports were written with the overview in mind, not just a personal experience, they became a complimentary counterpoint to the oral histories.

An alternative analysis was assumed as the study progressed. The unit of analysis was altered from an incident-level to a sentence-level. This allowed the

themes to emerge without being constrained unduly by the coding structure. The analysis was iterative open coding with sensitizing constructs. (Miles & Huberman 1994) The originally conceived categories loosely followed the NIMS structure: preparedness (planning), communications and information management, resource management, and command and management (with one NIMS' component, ongoing management and maintenance, not being used since it has a longer-term focus). These categories did not hold up when the themes emerged from the data. The majority of the categories were notable for their lack of data within their area.

This study was hindered by a lack of specific types of information which is potentially influenced by several situational factors. Catastrophic disasters are chaotic and traumatic for all involved. Memories are not necessarily the most reliable. And traditional documentation methods are not usually working within this type of situation. In addition, there are privacy concerns not only for the victims but also the responders, as they too are impacted by catastrophic disasters. In regards to Hurricane Katrina specifically, there was an incredibly charged political atmosphere due to the perceived failures and the intense media scrutiny. This environment meant the government did not release information as it may have otherwise done or redacted the reports after releasing them. This lack of transparency is troubling when considering the need for accurate data when evaluating the problem, so all potential solutions may never address the actual problem since it was never identified correctly. In addition, there are many public health implications to withholding data about what worked and did not work in a disaster response.

In order to understand the planning and response to Hurricane Katrina, several additional types of information would need to be shared. The most critical types of information that would help this study and future research endeavors include: raw data, agency after-action reports from responding agencies of all governmental/agency level (there are no FEMA, state, or local after-action reports easily-found publically available, only secondary agencies such as the Government Accountability Office and Congressional hearings), non-governmental agency reports, and more personal accounts (which would mean individuals would have to not feel intimidated to keep silent). There should also be a central repository about disaster planning and response that holds all applicable planning documents, after-action reports, and accounts. That way there is only one place policy-makers, emergency planners, and researchers need to access in order to compare and find potential solutions to their community's specific needs. The specific holes in the available information will need to be iteratively discovered as more information is released and analyzed since it is challenging to predict exactly what is not available or needed until more is known.

5 Findings

Emergency services based in New Orleans were informed Saturday,
August 27, 2005, that the storm would be hitting the city and it would be severe.
Many older residents were anticipating that it would be similar to Hurricane
Betsy, which hit the area in 1965 as a Category 4 hurricane, and as a result chose
not to evacuate. (Democratic Staff of the House Committee on Science 2006)
The New Orleans Fire Department (NOFD) had a detailed operational plan in
place for severe storms so they moved their apparatuses to high ground, stocked
supplies in the primary and secondary shelters, and deployed to their assigned
areas. The firefighters anticipated assisting with evacuation and rescuing citizens
using their normal equipment. And while they were aware that fire could break
out, they were not anticipating that whole neighborhoods would be in flame at
the conclusion of the storm. New Orleans Emergency Medical Services
(NOEMS) were called in to work and told to bring three days' worth of supplies.
They did not have a specified disaster plan that they were following, so the
responders went to work like normal. The California 6 Disaster Medical
Assistance Team (CA-6 DMAT) were put on stand-by by the DMAT Federal
Operations Center, within DHS, on Saturday, August 27th but were not activated
until Sunday, August 28th. (A DMAT is a deployable unit that will bring together
medical personnel, with supporting logistics and transportation personnel, from
an area distant from the disaster site and respond to assist as they can. The

DMATs are loosely based on the military's mobile hospitals.) (Institute of Medicine Committee on the Future of Emergency Care 2006)

5.1 Data Collected

When the oral histories were examined, the three groups of responders (NOEMS, NOFD, and DMAT) were shown to have similar experiences and displayed similar themes. There were twelve overall themes. From the two oral histories from NOEMS, nine themes emerged from these accounts. Of these nine themes, five of them were seen in all three responder groups and four others were in one other group besides the NOEMS. The five themes found in all three groups were: poor or no communication (no radios, no cells, limited face-to-face), breakdown in logistics, responder safety was tenuous, there was a lack of basic supplies, and interactions with FEMA officials was overwhelmingly negative. In NOEMS and DMAT, there were three themes that they shared: feelings of betrayal arising from the government officials' actions (and the actions of the New Orleans Police Department for NOEMS), the basis of action & decision-making was personal experience and previous training, and there was an impacted ability to make sense of what was going on.

In addition, within the DMAT and the NOFD accounts there were themes of: patient transportation/evacuation mechanisms were not working as anticipated, the authority and leadership directing responders' actions were acknowledged, and they utilized previously developed internal disaster plans. Within the DMAT accounts, there was also a theme of lack of documentation abilities due to the circumstances of their response. Quotes from each theme are

listed in the table below (see Appendix A, as the numbers after the quotes refer to which oral history the quote comes from).

Theme	Responder Group	Quote
Poor or no communication	NOEMS	Talking about the immediate response to Katrina "Interviewer: So, pretty much your work prior to that was pretty much all on your own initiative?... Responder: Yeah. Interviewer: …no one called you and said, we need you to come here or--? Responder: They would not have made me do that." (1) "…the radio was very sporadic. We couldn't contact anybody on the radio." (2)
	DMAT	"…was a combination of military and civilian helicopters… it was our folks who were loading the helicopters. So we don't know, we don't know how they were being controlled in the air. We just knew that they were landing and taking off and the pilots and the crew didn't know anything about what was going on either. We didn't know where people were going... we didn't have any communication with them other then verbally, while, while they were on the ground." (3)
	NOFD	"we heard Tuesday night that some guys from the fire department had a fire alarm and… they had wound up at Delgado College and they were trying to get out of there. They were surrounded by water. So our communications were pretty much shot at that time. We could hear them, then we tried to communicate back and we couldn't get through to them." (18) "And the fire department was very cut off from itself, because our whole communication system for the city: police, firemen, that's all went to hell. We had pockets of firemen that – everybody was self sustained at first. Because we didn't know what – you can't get in touch with anybody. Cell phones, everything wasn't working. The one thing you thought you could rely on, the radios, didn't work. They worked all through the storm. It's kind of funny: the radio system, the water – the levees breaking, the flooding, all that happened after the storm. It was when the wind died down. The sun was coming out." (17)
Impaired sense-making abilities	NOEMS	"We ended up leaving from there and we were looking for a place to go because, at that time, we didn't know what the heck we were going to do…" (2)
	DMAT	"…the critical thing that I recall that should probably be reserved so that other units don't make the similar

		mistake is that when we were staging in Houston we had very poor intelligence being brought in from forward placed units. We basically didn't know what we were walking into…. It's a multi-faceted set of conditions that created that particular result. Um, but that was one of them, a lack of communications infrastructure because the storm devastated so much. Um, but there was a lack of local planning on the parts of the locals there. There was a lack of planning at the state level in terms of their ability to support communications and initial disaster response locally. And then there was a failure at the federal level for them to be able to, they were able to mobilize units, but they weren't able to coordinate and logistically supply those units in the way that they should have been able to do." (14)
Basis of action & decision-making	NOEMS	"…we'd either go post places or just drive, looking. You know, looking house to house. Looking for people who may need help. We even were feeding the poor animals that were starving to death."(2)
	DMAT	"We're a pretty aggressive group of providers and we're getting pretty antsy. And we got all these things going on around us and we're not allowed to participate because we're not assigned." (10)

"And so we made the decision to, to leave. Because we were essentially out of medical supplies, they weren't landing helicopters to evacuate, and then here's this, you know, pending riot happening inside the Superdome… I was just sick to my stomach. And I could see that sort of in everybody else's eyes as we were going through that half hour process of, let's bug out, answering all the questions about do we take the patients or not… making all these decisions, in this hush hushed manner. Um you could see it was really distressing to everybody." (3) |
| | NOFD | "We found out at that time… Lindy Boggs [hospital] needed to be evacuated…they said that 15 people at Lindy Boggs were in danger of dying if they weren't, like evacuated immediately…And what they did was, they loaded up boats full of patients and patients' families and medical staff and sent them back to us at the staging area…" (18)

"Days into it, you know, I mean, eight, ten, twelve days in to it, when we started relocating and meeting up with other members of the fire department that you hadn't seen for a week and a half, two weeks, and you started talking to them. And it was funny because they were doing the same thing we were doing, just in a different location of the city. You know, so it was really impressive that, even though communications were cut off, you know, the chain of command was only who you |

		could speak to face to face. You know, the guys that were in different areas were doing what needed to be done." (19)
Logistics breakdown	NOEMS	"…we didn't have any place to go…We had to be rescued ourselves out of there by boats…" (2)
	DMAT	"I was more or less assistant communication officer… had the foresight, to bring a cache of [unclear] radios with us, because what happened was our cache or our full load of equipment broke down on the Nevada-California border, and so we only had eight radios and chargers and a sat phone, and so we were very limited in our ability to communicate internally and externally." (4) Talking about after-deployment in Baton Rouge, trying to get basic supplies for the responders. "So I went down there with them. I was given a FEMA credit card. I was told it was going to work…because we had no equipment. We'd left all our equipment at the Superdome, all our personal equipment. And got to the cash registers, and the FEMA credit card didn't work. So I put down my American Express card, which I finally got reimbursed for almost a year later, I think about a year later, you know. It was a couple thousand dollars worth of stuff. Then I went back to Baton Rouge, and I said, 'This card didn't work.' They said, 'Oh, we forgot to call the bank and unblock it.'" (4)
	NOFD	"We had no water…[no water pressure to fight any of the fires] That was a shock to us… that I realized we've got problems with water. And, you know, I mean, we were – at that fire, it was like, come drop your hoses in the street and suck the water out of the street." (17) "And it was chaos because we still didn't know who was at work – wasn't at work – it was chaos, confusion, people – people were stranded. People were here, half the people were there. We didn't have a whole lot break ranks but, you know, they did have a few, but it was very hard to try to find who was here and who wasn't. You know, and accountability." (17)
Safety was tenuous	NOEMS	"…but they were still working in a city that was destroying itself and, you know, basically morale was not very good. You know, some of them had been shot at and, you know, other ones had stories like mine." (1)
	DMAT	"Dave is… taking this lady on a mattress up into this National Guard truck, and shots rang out, you know. All the National Guard and Dave and everybody kind of hits the deck, and we look around. They finally get her loaded up and take off, and I never saw the shooter…"

		(9) "And whoa, they're shooting the Guardsmen. Now what will they do to us, you know? It felt extremely unsafe, but I didn't have anybody threaten me…." (9)
	NOFD	"I became a security chief on the first day… and I gathered all the firemen that had military experience and we set up our security for that night. We set up a perimeter around the college campus, and we set up a watch list. And we had, you know, an organized security force by the next day. Because, when we started coming back into the city, we sent one fireman on each fire truck armed to protect the fire truck. Because there were – there were first responders who were getting shot at. I didn't personally see it, but I heard about people on boats and other places that were shot at." (20)
Lack of basic supplies	NOEMS	"-no food, no water and all that kind of stuff." (2)
	DMAT	"…we had what we had, so we're running out of everything from the get go… I was triaging patients, and deciding how much oxygen this person should or should not have, or if they really needed it…" (10) "I was sorry I couldn't get people more appropriate medication. We didn't have any more formula for the babies. We didn't have any more diapers." (9)
	NOFD	"We were hungry… I never thought I'd ever experience – to be hungry and not have nothing to eat. To be filthy dirty and not be able to clean your clothes. I mean, it's just – it's just a humbling experience of what life can be." (17)
Negative interactions with FEMA officials	NOEMS	"So we wound up…at the new FEMA headquarters… and I met the Director of Urban Search and Rescue for FEMA who then, unbelievably, wound up telling me and my friend, who are emergency-medicine trained and the Operations Manager of Acadian Ambulance… that there wasn't any room for us on any other teams. And that it would be more of a hassle because we'd have to be federalized to be able to work with FEMA. So, they basically turned their back on two emergency medicine trained physicians, and an entire ambulance service, because we didn't fit into the overall scheme of things and they'd have to bend the rules a little bit for us to be able to work with them, so- which I found extremely alarming…" (1)
	DMAT	"…and then when we got down to the waterline where we had to stop—the trucks refused to drive through the water. They were big refrigerator trucks, and one of the FEMA guys who wanted the equipment was up on the thing screaming at us. He obviously didn't care much for our team. He's just screaming—I'm not sure how much to say, but, you know, he said, "Get those—get

		that equipment and those goddamned trucks across the way." He said, "CA-6 can just swim in the water, for all I care. I want those trucks." That was our command and saying, you know, "You guys are worthless. I just want the equipment." He was up there screaming. It was terrible..." (5) "…I never saw a FEMA person come up to the arena to see what we were doing, you know." (4)
	NOFD	"But we stayed there and, come to find out, that FEMA had shut the operation down…And they said – they told us to get out. Not only that… people at the FEMA staging area told us, if we bring anybody else there, they were going to arrest us. So, it was really…they said they were going to take our boats and arrest us. So –… they were ordered out and they were under threat if it – if we brought any more people to FEMA, they were going to get arrested and, you know, that really weighed heavily on them because…the people that they had promised and, you know, that they thought that we had plenty of help coming. So they really agonized over that you know." (18)
Patient transportation/ evacuation mechanisms not working	DMAT	"…That operation went on to about three o'clock in the morning when a National Guardsman was shot with his own weapon…but at that point they shut the air operations down. I went back down at seven o'clock in the morning and talked to the colonel and said, "Okay, let's start up air operations again. We've got a backlog of patients." By then we had a huge backlog of patients. He said, "We're not going to bring any more helicopters in here." I said, "I don't understand." He said, "You heard me. We're not going to bring any more helicopters in here." …and they had an anti-sniping team up on the landing zone, you know, with Ghillie suits on and everything. [due to citizens shooting at the helicopters] I said, "Oh, my god, you know, this is not a good situation." So then I went back and told Commander Lipin, "We can't start up air operations again. They're not flying any more helicopters in…" (4)
	NOFD	"So I went to go get my truck because I had the boat with me…There was roughly about 22 to 25 New Orleans firemen that brought their personal boats to work on that day." (19)
Authority and leadership	NOEMS	"Well, in a perfect world, I'd like to say somebody was orchestrating activities during something like that, but there really wasn't…. We were actually there for about an hour before we found somebody claiming to be in charge." (1)

	NOFD	"I just think that compassion of the firemen really came through. To be able – especially the ones that did all the boat rescues and all of that stuff, and all that. I mean, these guys didn't have to be told twice. They just – I mean, there were times you couldn't find people, and they were supposed to be at the compound at nighttime, and they were out in boats in the darkness right at – you know, they weren't even supposed to be out there. Well, how are you going to – you can't – what are you going to do, get on people and discipline them for doing that. I think – you know, that's just the will of the heart there. I mean, these guys really came through big time, you know with helping people and all that." (17)
Betrayal	NOEMS	"I remember feeling a sense of betrayal by authorities… I felt like we were failed. Because help just couldn't get to us quick enough… And so many people died… that was a huge slap in the face for them to leave us like they did… they said I would never leave anybody behind. None of us would. That's not what we're trained to do. We're trained to help…" (2) [Responder was part of EMS group abandoned by the police unit they were supposed to be working with and had to self-evacuate to safety.]
	DMAT	"I think sort of at a more abstract level I think my faith in the federal government, actually in government at all levels has gone down several notches… and not place my faith in, you know, someone else's ability to determine whether or not a site is secure enough for us to go into or not…" (3)
Lack of documentation	DMAT	"Interviewer: You mentioned you often had to separate children and parents. Was there any type of bookkeeping going on as far as…? Responder: None whatsoever. We had ah; we had lost all ability to do any recordkeeping… All the paper records, and we only carry five hundred or something with us, and those were long gone…So there was no, yeah, there was nothing, no record keeping, no, and we were far too busy with the patients to have any ability to care for the people who weren't patients. When we separated family members it was." (3)
Using previous established plans	DMAT	"But there is a structure, a process that we follow…a sort of chain of command called the incident command system... I think that that probably enabled us to function as well as we did in that environment…But it wasn't designed for that purpose, for that extreme." (3)
	NOFD	"This is the purpose and the guideline – from a hurricane guideline book, the 2005, that our Superintendent had put together two years ago, and we sort of tweaked it last year with Ivan. We made some changes. And then, of course, we made the changes

		again to it. But we were prepared…. We had a hurricane procedure guidebook in place, where all of our equipment and all of our personnel had a last place of refuge for the storm. And then we regrouped again for the flood, and evaluated and made the decision to move all of the equipment to the West Bank, which was the reason why we all – we saved all our equipment. We didn't – we only lost a couple of small pieces of equipment. We had a plan and we stuck to it, pretty much. It wasn't perfect, but it got us to where we needed to be, on dry land with drinking water and, you know, some facilities. So, you know, I credit our Superintendent for the foresight and Chief Gary Savelle for working so hard in putting it together. And it worked." (20)

In all of these emergency responder accounts, the most interesting aspect was that there were key anticipated elements that were completely not mentioned by any responder. The themes that were not present include: no overarching resource management, no incident command or overall command center (only the local New Orleans command post was mentioned by only one of the firefighters), or an inability to document any aspect of the response. The missing elements show that the responders were completely operating out of their HRO Institutional Logic, and NIMS (as the bureaucratic way to deal with this type of situation) was completely not used. NIMS and its roll-out was unsuccessful, it was not adapted. A new solution needs to be developed that works with agencies and operators from both types of Institutional Logics.

5.2 Hypothesized Framework

From the data analyzed, the table below was developed. The table shows elements of Logics that are radically different and could be factors in the problem

of the continual break-down of information flows in catastrophic disaster planning and response.

Elements	Bureaucracy	HRO
Preferred communication method	Formal written documents	Verbal story-telling
Transmission of institutional information and values	Manuals, documentation, orientation training	Stories, modeling, mentorship
Decision-making authority	Role	Expertise
Basis of action	Standard Operating Procedures	Situational awareness
Organization structure	Hierarchical departments	Squads within companies or agencies
How organizational change is enacted	Changing the official policies and procedures, as reflected in official documentation (i.e. SOPs)	New narrative presented along with compelling reasons for the change

6 Discussion

Inter-organizational information flow break-downs continue to persist within the planning and response efforts to catastrophic disasters. These significant information flow problems arise from fundamental, but critical, differences in institutional logics among the collection of organizations that are involved in catastrophic disaster response. A framework comparing the Bureaucratic and High-Reliability Organizational Institutional Logics was hypothesized, which will hopefully provide insight and directions of further research.

There are limitations inherent in this study. This is an exploratory study looking at a problem that cannot be directly observed, which can lead to faulty assumptions and conclusions being made during the research process. This study was conducted in a very limited time span and had few resources to depend upon. Hurricane Katrina was the exemplar catastrophic disasters focused upon and since the NIMS was still being implemented when Katrina hit, the changes FEMA were attempting to enact may not have yet shown up in the emergency response organizations' operator behaviors. Despite the potential limitations, this study offers prospective directions on how further research efforts can contribute to the discussion and, hopefully, to an effective solution.

This continuing problem needs further research into the causes and potential solutions in order have more effective and efficient catastrophic disaster planning and response efforts. Hurricane Katrina is but one catastrophic disaster, by exploring a variety of disasters (both natural and man-made), a better

understanding can be developed. This area would also benefit from different types of research studies looking at these issues, such as participant observation studies or more in-depth case studies. There would be value in expanding the study boundaries to look at disasters at locations around the world, comparing if the framework is valid within different cultures. Most importantly, the framework of co-existing Institutional Logics and the subsequent information flow problems can be studied in other types of organizations (tribal and local or federal and non-governmental agencies) and in other contexts besides catastrophic disasters. These further research directions will allow a depth and richness to the understanding of the problems involved with creating and maintaining effective information flows in chaotic environments.

One of the contributions of this study was the identification of major gaps in the publically-available accessible information about disaster planning and response efforts in the United States. These gaps are detrimental to the efforts of policy-makers, academics, and the emergency responder fields. Without a better understanding of the actions taken in previous disaster situations, the reasons for said actions, and the outcomes, better policies and procedures cannot be created that will potentially ameliorate the unnecessary death and destruction. So there will continue to be a high rate of mortality, morbidity, and loss of property and infrastructure.

Appendices

Appendix A: Oral Histories Information

All oral histories were recorded through the New Orleans Oral History Initiative and were conducted by Mark Cave.

Reference Number	Names	Position	Organization
1	Chris Najberg, MD	Emergency medicine resident and a supervisor for NOEMS	NOEMS
2	Melinda Guerra, EMP-P	Emergency Medical Technician – Paramedic	NOEMS
3	David Lipin, EMT-P	Commander & Paramedic	CA-6 DMAT
4	Richard E. Brown, EMT-B	EMT & Communications Specialist	CA-6 DMAT
5	Dawn Boyer Comer, EMT-B	EMT-B, certified grief counselor	CA-6 DMAT
6	Brian Blaisch, MD	Chief Medical Officer & Deputy Team Leader	CA-6 DMAT
7	Crystal D. Wright, EMT-P	Emergency Medical Technician – Paramedic	CA-6 DMAT
8	Rev. Toby Nelson, Th.D.	Chaplain & certified trauma counselor	CA-6 DMAT
9	Shaun Partlow, P.A.	Physician Assistant	CA-6 DMAT
10	Kevin Sankey, R.T.	Respiratory Therapist	CA-6 DMAT
11	Bonnie Atencio, RN	Registered Nurse & Administrative Officer	CA-6 DMAT
12	Elizabeth Leia Mehlman, RN	Registered Nurse	CA-6 DMAT
13	LeNai Dohr, RN	Registered Nurse	CA-6 DMAT
14	Ron Lopez, RN	Registered Nurse & Supervisory Nurse Specialist	CA-6 DMAT
15	John McPartland	Deputy Logistics Chief & Assistant Training Officer	CA-6 DMAT
16	Barbara Morita, P.A.	Physician Assistant	CA-6 DMAT
17	Chris Mickal	District Chief & founding member of the NOFD Photo Unit	NOFD
18	Joseph Fincher	Captain	NOFD
19	Thomas Meagher	Captain	NOFD
20	Gordon Cagnolatti	District Chief	NOFD
21	Robert McCoy	Captain	NOFD
22	Thomas Howley	Captain	NOFD
23	Charles Parent	Superintendent	NOFD

Further Citations

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Appendix B: Further details about the National Incident Management System

NIMS is a standardized system of how to approach incident management as well as a core set of terminology, concepts, and technology. (Walsh et al. 2005) This program was created after Homeland Security Presidential Directive-5 (HSPD-5) was enacted in early 2005 (Walsh et al. 2005) in conjunction with the 9/11 Commission's recommendation that a universal emergency response plan with clear command and control structures and mechanisms should be created. (9/11 Commission 2004) NIMS was implemented in March of 2004. (Walsh et al. 2005). This program was conceived of and created by the federal government officials. NIMS was their answer to all the problems and questions that arise in a response to a catastrophic disaster. Emergency responders from any level of government or agencies were not part of the creation process. (Bosner 2011)

NIMS was built on the foundation of several previous programs and frameworks, seemingly without an analysis of what the previous plan strengths and weaknesses were. (Buck et al. 2006) In response to the extensive forest fires in California in the 1970's that required multi-agency responses, the firefighting agencies created a system that was eventually known as the Incident Command System (ICS). (Buck et al. 2006). ICS was supported and promoted by the firefighting community, teaching it in all of the basic training classes. ICS focuses on planning, training, operations, and logistics, including:

> "standardized job descriptions with a training program for
> those positions; common terms for equipment and supplies; a
> structured chain of command from the specialist on the ground

to the incident commander with unity of command emphasized and each person in the organization reporting to one boss; authority commensurate with responsibility, and task assignments made rationally to the person most qualified for the assignment regardless of rank in the organization; span of control limited to the number of people that one person can effectively control; sectoring of work to insure efficiency, effectiveness and safety; finally ICS is based on the scalar principle, with its size and complexity depending on the size and complexity of the disaster or emergency incident to which it is applied." (Buck et al. 2006, pp. 1)

ICS is acknowledged as being strong in the command and control areas and it was revolutionary when it was developed. (Buck et al. 2006) One of the system's greatest strengths was that it had and continues to have complete acceptance of the firefighting community, which is a very tightly-knit community.

The system is not without its flaws, as discussed in Buck et al. (2006). ICS does not facilitate inter-agency coordination, especially when there are different types of agencies (i.e. law enforcement, emergency medicine agencies, and relief agencies). There were still communication issues which were made worse when the agencies had never trained together prior. The system does not deal well with civilian organizations. And control of the situation was often lost when there was a transfer of command from the initial Incident Commander in the field to the commander in the staff in the Command Center.

The Federal Response Plan was developed in 1992 by FEMA to also address the coordination issues seen in multi-agency disaster responses. (Bosner 2011; DHS 2013) Originally, the FRP was completely separate but eventually incorporated ICS and the two systems were dovetailed. (Bosner 2011) ICS and the Federal Response Plan were utilized in the emergency responses to the Northridge Earthquake (1994),

Oklahoma City Bombing (1995), the Atlanta Olympics bombing (1996), and the

DeBrice grain elevator explosion (1998). (Buck et al. 2006). These responses were

considered successful implementation of ICS with positive results. As a note, all of

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