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Media Tales of Two Coastal Cities: Exploring the Coverage of Sea Level Rise in New York City and New Orleans

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Media Tales of Two Coastal Cities: Exploring the coverage of sea level rise in New York City and New Orleans

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

Abstract

Durham, Nicolene (M.A. Journalism & Mass Communication)

Media Tales of Two Coastal Cities: Exploring the coverage of sea level rise in New York City and New Orleans

Thesis directed by Associate Professor Shu-Ling Chen Berggreen

The study of climate change communications is an area of research that's relatively new, changing and considerably important as the climate itself evolves. Analyses of climate change in the media have examined the impact of ideology, the power dynamics and politics over who speaks for the climate, and implications of the way climate change is framed. This study media effects and climate change communications, in order to showcase the unique "tale of two coastal cities," considering a case study that compares New York City, New York and New Orleans, Louisiana. The study first explores a background of each region's political ecology, including the landscapes at risk as well as the political scape to briefly discuss regional policy, culture, and news. Theoretical perspectives draw upon Louis Althusser and Michel Foucault to consider the roles of ideology and power, while analyzing the cultural structure of each region. Second, the literature review tracks previous scholarship on framing analysis and climate communications. Third, a quantitative content analysis compares the coverage of sea level rise in two newspapers, *The New York Times* and the *Times Picayune,* over a ten-year time span with consideration of the impacts that Hurricanes Katrina and Sandy had on the framing and distribution of climate news. Finally, the study concludes with a discussion of the analysis and consideration of framing, power and ideology.

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Chapter I: Introduction

Two eastern corners of the United States, New York and New Orleans, are regions that will experience the effects of climate change due to higher temperatures and sea level rise. Some of these effects might be water shortages, more frequent cases of illness, stronger storms and flooding. It is well-recognized that southern Louisiana was founded and developed on land below sea level, which increases the state's risk for sea level rise. New York City, a metropolis surrounded by water, will also face an increasing number of challenges with the onset of climate change. Yet because New York boasts a legacy of such marked power and innovative capacity, the risks might be perceived as less urgent. By contrast, New Orleans ranks higher in poverty and crime, and it is facing rapid wetland erosion, in the midst of rising seas. Each city faces its own challenges, and because the cities' social structures vary in power dynamics, wealth, size and weather, their adaptive capacities and risk communications practices will also vary.

In an article that explores several facets of Mumbai's social structures which respond to climate change, Boyd and Ghosh (2013) consider the 'well-rehearsed' argument that there are similarities between urban social institutions and the surrounding ecosystem. This theoretical line of work, the authors point out, "emerged from the trans-disciplinary merging of environmental and social sciences, linking the understanding of the ecological dynamics of the biophysical system with the awareness of social, historical, political, and economic context of urban systems" (p. 928). They add that theories of panarchy, resilience, and adapting institutions lead to questions about what actions are being taken to address adaptive capacity, why communities engage in certain strategies and what perceptions about climate change risk are present. In some ways, a social institution is like a functioning ecosystem, like the natural patterns of a landscape

that urban communities rely upon. Natural ecosystems and historical context can reveal the health and characteristics of life forms, which co-habitate, interact, flourish and adapt. The social structures of governance and culture are crucial aspects for both New York and New Orleans in this discussion of adaptive capacity. Yet in addition to the physical features of each region's landscape, and their structural features of governance, the cultural ideologies within each region impact ecological perception – through education, ritual practices, and news. The following two sections will explore the historical context of both New Orleans and New York City, with consideration of their natural landscapes, governance, and cultural ideology.

New Orleans

Louisiana was discovered in 1699 by Pierre le Moyne, Sieur d'Iberville when he explored the Mississippi River and established a royal French colony at Ocean Springs, Mississippi. France granted a charter to Antoine Crozat, providing him with a monopoly on commercial matters in the New France in 1712, and five years later he surrendered his royal charter. In 1718, Jean-Baptiste le Moyne, Sieur de Bienville established New Orleans (Martin & Yeates, 1991). Throughout the century that followed, the marshland was drained, built on, ravaged by hurricanes, rebuilt, ravaged by fires from French-Spanish revolts, and rebuilt again. It's French and Spanish roots from the early development of Louisiana largely impacted the political and legal systems, making Louisiana the only state in America to follow a Napoleonic-derived Civil Code. Throughout history, Louisiana has been known for its political corruption.

In Mike Tidwell's (2007) novel *Bayou Farewell*, he elaborates on the history of New Orleans political corruption since its roots to today. Noting the limited amount of media attention that's been given to volumes of scientific research on the urgency of Louisiana's disappearing

land, he writes: “This was in part out of fear the attention would tarnish the image of an oil industry which accounted for nearly 20 percent of the state’s gross economic product in 2000” (p. 78). This kind of mentality is rooted in the history of Louisiana’s political corruption. Tidwell refers to the Union major general Ben Butler, Governor Huey Long, LSU president James Monroe Smith and Governor Richard W. Leche – all individuals who were accused of wrongfully using public money in a way to suit their interests. Additionally, this largely resembled the kind of French colonial governing in the 1700s, in which leaders were regularly sentenced for financial scandal. For example, the Marquis de Vaudreuil, 18th Century governor of Canada and French Louisiana, offered open monopolies to traders in exchange for premiums that went to his personal account (Tidwell, 2007).

Considering a Foucauldian governmentality framework, the progression of Louisiana politics can be seen as a reflection of its early power dynamics, between leaders with corrupt incentives and the people. Dean (2009) considers governmentality an “analytics of government,” recognizing power relationships between individuals and critical thought for “how we think about governing, with the different rationalities” (p. 24). As Bäckstrand and Lövbrand (2006) suggest, Foucault’s concept of governmentality is associated with a multiplicity of rationalities, authorities and agencies that “seek to shape the conduct of human behavior” (p. 54). In addition to Louisiana’s history with corrupt politics, industry has represented one of these agencies of power, especially through its iconic meaning of wealth and success. Many political leaders are known to have received funding for various government initiatives from the oil and gas industry, including Huey Long for populist policies (like providing free textbooks), and current Governor Bobby Jindal. Jindal, along with the appointed authority, is leading Louisiana’s “Coastal Restoration Master Plan,” a projected $50 billion project that will largely depend on funding

from the oil and gas companies that contribute to wetland erosion and line the southern Louisiana coast.

Yet even before oil and gas exploration in Louisiana, the sugar and logging industry left a scar on the ecological and demographic landscapes, setting the stage for future industry. Immigrants from France, Canary Islanders, African and Caribbean slaves, German farmers, Slavic merchant mariners and Chinese immigrants made their way to southern Louisiana to escape oppression, in the same manner that Acadians, or Cajuns, migrated to the bayou to escape oppression from Nova Scotia (and France to Nova Scotia even earlier). When the sugar industry kicked off, this diverse pool of formerly isolated demographics intermingled, among increasing numbers of black slaves, and put enormous wealth into the hands of a few (white) sugar plantation owners (Austin, 2006). The shift in social makeup and wealth distribution had an adverse effect on the region's education system, as planters typically provided their children with private education, slaves were denied of education, and marginal groups like the Cajuns and others viewed institutional education with suspicion.

In a similar way that Foucault's notion of governmentality points to social conduct through power relations, Althusser's (2009) theory of the "ideological state apparatus" considers how labor (or industry) relations drive the conduct of various subjectivities in a society, where a powerful elite establish the ruling ideology. A large part of the "ruling order," he suggests, begins with the institution of education (p. 132). In his essay "Ideology and the State," first published in 1970, Althusser considers a Marxist perspective on the reproduction of labor relations, in which education is what allows for the reproduction of labor relations. He argues that in order for something to exist, "every social formation must reproduce the conditions of its production at the same time as it produces" (p. 128). Relations of production rely on labor

relations, and as Althusser argues, the reproduction of labor is determined by hegemonic "rules of order," or the educational practices within a culture. Considering this insight, if education was either accepted, denied, or rejected by individuals in southern Louisiana, then various strings of ideological belief systems would be the result, influenced by the various attitudes towards labor, skills, and knowledge. If minority migrants were deprived or skeptical of the dominant schooling practices, then the dominant school practices perpetuate a power divide between the "educated" and the "uneducated."

Althusser defines the rules of behavior, or the attitude that should be observed by every agent in the division of labor, according to the job one is "cut out" to fulfill. He expands on the notion that school systems enforce these "rules" of order, in addition to the labor roles that are out there that exist (p. 132). Definitions of labor come into fruition by the positions of work, the workers, the hierarchical worker relations and wages for a set of expectations. Since Louisiana's beginnings, the ideology of industry was shaped by those in positions of power from wealth and literacy and those who worked *for* the industry, having less access to information regarding industry risks and less power to contest the "ruling class." Further, as the oil and gas industry off the southern coast of Louisiana became an iconic symbol for wealth, it also became part of many Louisianan's livelihoods and cultural identities.

Althusser proposes two theses, that "Ideology represents the imaginary relationship of individuals to their real conditions of existence," and "Ideology has a material existence" (Althusser, 2009). To clarify, he makes the distinction between the repressive State Apparatus (SAs) and all other "specialized institutions" that comprise a list of Ideological State Apparatuses (ISAs). His conception of ISAs included: religious, educational, family, legal, political, trade-union, communications, and cultural "apparatuses." The repressive State Apparatus refers to

systems like government, administration, the army, police, courts, prisons etc. (p. 143). He points to the key difference between these systems, that SAs function "by violence" and ISAs function "by ideology" (p. 145). Similar to Foucault's notion of power relations within governmentality, Althusser's two apparatuses represent the relations of power through either law or dominant thought. Social and cultural diversity, wealth disparity and the lack of education are all significant factors in identifying a state's perception about cultural identity, industry, and environment. When power is placed in the hands of a few wealthy elite, while information about industry risk might be suppressed, decisions will only benefit the wealthy elite, and money will drive many of those decisions.

Given the historic nature of Louisiana's political corruption, it is no surprise that neither the social institution, nor the natural landscape was prepared for the worst natural catastrophe to hit the United States. Hurricane Katrina cost $108 billion, nearly 2,000 lives and about $81 billion in property damage. In addition to setting the record as largest natural disaster to hit the United States, Katrina is well known for being a man-made catastrophe. Levee failures were the result of mismanaged upkeep and federal emergency response fell short of public approval. Thousands of individuals were displaced from their homes, and in addition to rebuilding, the city is still working to sell abandoned property lots in the lower Ninth Ward.

As Cigler (2007) wrote in a paper that addresses the "big questions" about Hurricane Katrina, "Katrina was the most predicted disaster in American history – a natural event that combined with massive human failure before, during, and after the event. It exposed failed systems of engineering ,government, economics, public safety, logistics, recovery, and race relations" (p. 64). In addition to the levee system that was years behind schedule for appropriate maintenance, the federal government response to Hurricane Katrina is widely criticized. FEMA

(Federal Emergency Management Agency) the U.S. agency responsible for securing victims of the hurricane with financial aid, housing and food, was seen in the public eye as a failure of the United States government. Cigler mentioned that on top of a long-time charged "institutional inertia," President Bush appointed individuals with limited natural disaster experience to head FEMA. After 9/11, attention within the agency shifted to terrorism and even more individuals were lost to the agency with natural disaster experience. FEMA became absorbed into the Department of Homeland Security in 2003, losing its direct access to the White House and its budget was substantially reduced (Cigler, 2007). The outcome was a massive lack of capacity to respond to the hurricane victims' needs. Historically, "New Orleanians" are known for their distrust in the government, and Hurricane Katrina did nothing to change that.

Poor governance, sea level rise, and the rapidly eroding wetlands all contributed to the catastrophe that Katrina was. There are both human and nonhuman reasons for the rapid pace of wetland erosion. The land is sinking due to subsidence and the nature of the soil; soft sediment of the marshland compacts and sinks over time, and the process that used to naturally restore wetlands no longer occurs. Because Louisiana's wetlands are at the bottom of the Mississippi River Delta, the river used to push sediment downstream and into the wetlands. Natural spring floods were especially important for this process, because in the case of a flood, there was more sediment to carry. Human intervention, however, prevented this natural process from happening. After the Great Mississippi Flood in 1927, the U.S. Army Corps of Engineers played a significant role in determining how, from there on, the water would flow out into the Delta. The Flood Control Act that was established in 1928 called upon the Army Corps of Engineers to develop protective levee systems and other projects along the river, so that communities along the river's path would be safer (Austin, 2006). Yet, over time, the engineered channel for river

flow became much more narrow and pushed water out at a faster pace, depositing the water in many places across the Mississippi River Delta. These changes impacted the river's natural flow and tendency to carry sediment back into marshland soils.

In addition to the impact that the federal agency had on the river's ecology by preventing natural spring floods, exploration of oil and gas over the past century has compounded the rate of erosion by dredging through the fragile ecosystem for canals and pipelines. Carving the landscape boosted the pace of erosion, and currently, roughly one acre of Louisiana's coastal wetlands is disappearing every half hour to an hour. According to a U.S. Geological Survey fact sheet, "Louisiana's wetlands today represent about 40 percent of the wetlands of the continental United States, but about 80 percent of the losses" ("Louisiana Coastal Wetlands," n.d.). If the marshland ecosystems that surround the City of New Orleans continue to disappear at such a rate, the region will face impacts of climate change (especially sea level rise and hurricane frequency) much more severely. The Coastal Restoration Authority is currently working to restore parts of Louisiana that line the coast, proposing a $50 billion dollar "Master Plan." A large portion of that funding will come from one of the lawsuits over the 2010 BP oil spill ($1.2 billion) and from oil and gas companies under the Gulf of Mexico Energy Security Act ($140 million annually, starting in 2017) (Banerjee, 2014). Yet it is unknown, exactly, where the rest of that $50 billion will come from to restore Louisiana's coast (Marshall et al., 2014).

Out of reaction to this uncertainty and shared sentiment of violation for environmental justice, the Southeast Louisiana Flood Protection Authority (SLFPA) filed suit against 97 oil and gas companies in the summer of 2013. Their claim (led by writer and historian John Barry before he was ousted by Gov. Jindal from the SLFPA) attacks the industry for increasing wetland erosion, failing to fix the damage they've done and causing increased water flow against the

SLFPA's levees. The latter part of this claim is in violation of a party's "servitude to drain," which is part of the Louisiana Civil Code (The Lens, 2013). As it currently stands, the lawsuit is pending and losing momentum, especially since Louisiana (Republican) State Senator Robert Adley proposed bills that would undermine the SLFPA's independence (Frierson, 2014). With consideration of the ruling ideologies and relations of power in the state of Louisiana, the oil and gas industry, as well as political leaders who support and rely on the oil and gas industry, seem to have a greater say in the fate of coastal Louisiana. Beyond all of this background on the way industry has exacerbated erosion, oil and gas support the business of fossil fuels, distracting Louisiana from an investment in renewable energy alternatives, continuing its contribution to the emission of greenhouse gases and sea level rise.

New York City

New York City tells a story of its own – it is surrounded by water, with approximately 600 miles of coastline and a population of over 8 million people that extend to its five boroughs ("U.S. Census Bureau," 2012). A city of undeniably rich history, wealth and culture, New York City is a worldwide symbol for power, progression and possibility. The city was first inhabited by the Lenape, a tribe of the Algonquin people who fished, farmed and hunted between the Delaware and Hudson rivers. Giovanni da Verrazzano was the Italian explorer who first set foot upon the land in 1524, while searching for a route to Asia. A century later, the Dutch began to move into the area, in which 30 families were sent by the Dutch West India Company to live and work in a settlement on what is known as Governor's Island today. They called this settlement New Amsterdam ("New York City - Facts & Summary," n.d.).

The larger Manhattan Island was purchased in 1626 from the local people by Peter Minuit, the settlement's governor general, for "60 guilders in trade goods such as tools, farming equipment, cloth and wampum (shell beads)" ("New York City - Facts & Summary," n.d.). At the end of the second Anglo-Dutch War, the Director-General of the colony New Amsterdam surrendered the land to the British, and in 1664, New Amsterdam was renamed New York. New York was the capitol of the United States for a brief time between 1785 and 1790, and it became the nation's largest trading port when construction of the Erie Canal was completed in 1825 ("New York City - Facts & Summary," n.d.). The city was not only a major port to send textiles and cotton from the southern United States to Europe, but it also became a place for migrant Europeans, who sailed to the port of New York to start a new life there. The rise of immigration from the late 19th century and into the early 20th century allowed New York City to become the cultural melting pot that it is known to be today.

As Burrows and Wallace (1998) write in their introduction to *Gotham: A History of New York City to 1898*, "the history of New York is not reducible to a sound bite or bumper sticker…. it is impossible to understand the history of New York City by looking only at the history of New York City" (p. xvii). On top of its' culturally diverse attributes, the Wall Street billionaires and iconic skyscrapers of the 20th century, New York is known for its intellect and innovation. It is a city where art, politics and scholarship are woven into the breadth of a New York intellectual. As Thomas Bender, wrote in his book *New York Intellect*, "Only in New York are there the traditions and resources to reconstruct a vital and democratic public culture, one that includes the cultures of esoteric art and the academy, even while it challenges them both." (Bender, 2013, p. 23) The political structure of New York is dominantly democratic, and the city's government services more facilities and resources than other U.S. cities, accounting for public education,

correctional institutions, libraries, public safety, recreational facilities, sanitation, water supply and welfare ("2006 Annual Report on Local Governments," 2006). With consideration of Althusser, the ruling ideology of New York culture is shaped by a plethora of subjectivities, less by industry elites and the predominantly republican leaders who rely on their relationships with oil and gas.

New York has also endured a number of hardships as a city – including the Great Depression, financial recessions of the 1970s and 2008, 9/11 and more recently, Hurricane Sandy. Three years before Hurricane Katrina hit New Orleans, New York endured the devastating 9/11 attacks, which created political, economic and legal challenges for the city. The immediate economic consequences were a decline in in the stock market and dramatic losses for airline companies (Posner & Vermeule, 2009). On a policy level, the Bush administration enforced counterterror policies, in addition to the war in Iraq in 2003, which the administration often linked to the counterterror issue (Posner & Vermeule, 2009). As a city, redevelopment and community resilience were attributes of a response that influenced a decline in government cynicism and communal identity (Chanley, 2002). In her study on the decline in cynicism toward the government after 9/11, Chanley noted that increased public attention to international affairs serves to enhance public trust in the government. On the other hand, previous research points to the way distrust in the government "has been found to increase with public concern about crime, political scandal, and increasing media focus on political corruption and scandal" (p. 473). The distinction between 9/11 response and Katrina response becomes clear with this insight. Another point to consider is how the 9/11 attacks were caused by international intruders, instead of the way Katrina was a reflection of domestic government failure. It is easier for a population to cope with tragedy when somebody else can be blamed.

Though Hurricane Sandy was a different kind of emergency that challenged the city of New York and surrounding areas, the people and local government had already endured the challenge of 9/11, which contributed to a strengthened trust in regional and federal government, as well as community resilience. The story about Hurricane Sandy is a different one than Hurricane Katrina. While devastating, the northeast region's history of progressive politics, innovation and diversity of culture among the driving forces of ideological rule led to less of a catastrophe than the catastrophe of Hurricane Katrina. Yet this is not to say that Sandy was insignificant.

Hurricane Sandy is the second costliest hurricane to hit the United States, only to Katrina, costing about $68 billion and about 100 lives in the New York Metro area (Cowan, Goldstein, Goodman, & Silva, n.d.). In the aftermath of Hurricane Sandy, more than 23,000 people sought refuge in shelters, over 8.5 million people were out of power, the storm surge flooded numerous roads, tunnels, subways, blocked transportation corridors and left extensive debris all along its coastline path ("Hurricane Sandy," n.d.). The storm also covered 75% of the iconic Liberty Island ("Hurricane Sandy Recovery," n.d.). Because New York is a city of such dense population and densely-wired infrastructure, the social and financial risks for a hurricane hitting New York are very high. With the increase in glacial melt from Greenland ice sheets and west Antarctica, sea level is projected to rise 7-23 inches by 2100 (Rosenzweig et al., 2011). As global temperatures increase, fluctuations in the jet stream will contribute to the increase in extreme weather events, like tropical storms that could potentially become hurricanes.

The rise in sea level will have impact on New York's natural ecosystems through saltwater intrusion, increased risk to flooding, and an increased risk of damage to the residents of New York City. In their study published before Hurricane Sandy, Rosenzweig et al (2011) wrote

that New York is second only to Miami "in assets exposed to coastal flooding in the U.S." (Rosenzweig et al., 2011). They explored necessary tools for adaptation developed by the New York City Panel on Climate Change (NPCC), and as they explain, "climate change adaptation planning in New York City is characterized by a multi-jurisdictional stakeholder-scientist process, state-of-the-art scientific projections and mapping, and development of adaptation strategies based on a risk-management approach" (p. 94). The development of adaption to climate change in New York City is occurring in the context of other coastal cities, like the City of Boston's Climate Adaptation Work Group (Rosenzweig et al., 2011). In the northeast region of the United States, the ruling class which drives ideology comes from a network of researchers, scientists and political leaders, in some of the richest states of America.

In addition to New York's governmental agency that works to mitigate the effects of climate change, salt marshes along its coast also play a role, however like other regions, they are eroding. According to a study that analyzed the status of salt water marshes through aerial photographs since 1959, Jamaica Bay salt marshes, near the John F. Kennedy International Airport "are unlikely to keep pace with accelerated rates of sea-level rise in the future" (Hartig, Gornitz, Kolker, Mushacke, & Fallon, 2002). Jamaica Bay is one of the largest coastal ecosystems in New York State, encompassing the Jamaica Bay Wildlife Refuge, and it provides habitat for migratory birds, like Black Skimmers, plovers and knots (Hartig et al., 2002). Due to human infrastructure and development, these tidal wetlands are rapidly decreasing. In their study, Hartig et al examined digitized aerial photographs from the years 1924, 1972, 1994 and 1999, in order to analyze wetland change over time. They found that "land loss was immediately apparent upon examination" in which two occurrences were identified, including the "loss of shoreline on island edges" and "loss of internal marsh-land along large meandering tidal inlets

and their tributaries" (p. 77). A stable marshland not only provides crucial habitat for birds and other species, but it also provides coastal cities with a natural flood barrier to protect against storm surge.

As Hartig et al (2002) explain, a string of highly productive coastal wetland marshes developed in the Northeast region of the United States within the last 4,000 to 7,000 years. Yet in the last 100 years, this marsh-building process reversed in several locations. Reasons for this include dredging for navigation, and urbanization of Long Island's Rockaway Beach barrier island (stabilized by jetties that have protected the Rockaway inlet since the 1930s). Development of the beach has halted the delivery of sand from the periodic intense storms, much like the way sediment no longer reaches the Mississippi River Delta during spring floods. Hartig et al addressed that although there aren't long-term tide-gauge records from Jamaica Bay, "an increase in water depth generally leads to an increase in tidal range," which "may, in turn, enhance tidal currents and erosion" (p. 74). In addition to increased risk of inundation, erosion and salt water intrusion, sea level rise near New York could result in enlarged tidal pools and channels, putting coastal wetlands and wildlife at even greater risk (Hartig et al., 2002).

There are a few differences between the destruction and responses to Hurricanes Katrina and Sandy. While Katrina was a category three upon landfall, Hurricane Sandy was a category one; less power outages occurred from Hurricane Sandy than Hurricane Katrina; Sandy's wind speed was milder than Katrina's; and President Obama visited New York, New Jersey, and Connecticut within a day since Sandy hit. Comparatively, it took President George W. Bush four days to visit Louisiana, Mississippi, and Alabama in the aftermath of Hurricane Katrina. Preparation for New York City's adaptive capacity to climate change was already in place before Sandy made her way up the Atlantic coast (Rosenzweig et al., 2011), and media response to the

aftermath of Sandy was markedly different. One of the differences was New York's media attention to climate change, linking Sandy to the impact of rising seas.

A great deal of scholarship criticizes media professionals who covered New Orleans in the aftermath of Katrina, specifically for putting African American individuals in a negative light that suggested participation in wanton acts of looting or savage attempts to survive (Daniels, Kettl, & Kunreuther, 2011). It is true that in the aftermath of Katrina, the rate of crime increased, some people in the city looted buildings and homes, and there was not enough aid to feed refugees of the storm, but what gets lost from this criticism fixated on the media's failure to expose the better qualities of survivors or fairness among racial representation were the implications of mismanaged land and climate change. While media exposure of the racial divide in New Orleans was an important truth to unravel, there is not a great deal of scholarship on the way media coverage of Hurricane Katrina may, or may not, have influenced public perception of climate change.

When Hurricane Sandy struck parts of the Caribbean and eastern coastline of the United States, images of devastation returned to the forefront of climate change news, linking impacts of the storm to the impacts of climate change. Some connections between Hurricanes Katrina and Sandy were made in the media, including an op-ed written by Brian Fagan, anthropology professor at the University of California Santa Barbara, in the *New York Times*. Fagan wrote: "Hurricane Katrina in 2005 and Superstorm Sandy in 2012 were both wake-up calls for Americans living near sea level… Does one wall off New York, force people to build on higher ground, or restore protective mangrove swamps?" (Fagan, 2013, 10th para.). In other words, will cities mitigate or adapt? In an article published in the *Times Picayune*, columnist Bob Marshall addresses the prevalence of climate change policy in New York immediately following

Hurricane Sandy, which did not happen in Louisiana after Hurricane Katrina. In his lede, he wrote: "They say if you can make it in New York, you can make it anywhere. If that boast holds, then Hurricane Sandy may have done more for the future of southeast Louisiana than any of Louisiana's current political leadership" (Marshall, 2012, 1st para.). Again, this cultural attitude of government distrust resonates, in this case through the voice of New Orleans journalism.

There is some controversy over whether or not the coverage of climate change should be linked with extreme weather events. For example, in an op-ed written by Roger Pielke Jr. for the *Washington Post* immediately after Sandy, he urged, "While it's hardly mentioned in the media, the U.S. is currently in an extended and intense hurricane 'drought,'" and that one reason for the financial costs of today's disasters is that "there are more people and more wealth in harm's way" (Jr, 2012, 5th and 9th para.). Pielke Jr. stressed how this is mainly due to the fact that more people are living near the coast and rivers, in addition to local land-use policies and incentives such as government-subsidized insurance. But is it always problematic to make a far-fetched claim if it means that mass communications can broadly spread urgent messages, like the potential consequences of climate change?

Because more people are living in these locations, more people will be affected by instances of flooding, which could result from the erosion of wetlands due to human development and global warming-induced sea level rise. Raising an awareness of risk for coastal cities might encourage adaptive migration, or support for climate policy on a broader political scale. Furthermore, if extreme weather events trigger media coverage of climate change, then there is more media coverage on climate change – which is arguably better than a lack of coverage. In other words, extreme weather events could have an influence on setting the climate agenda.

Without wishing for an increased frequency in natural disasters in order to influence perception, understanding the impact that Hurricanes Katrina and Sandy had on climate news is worth consideration for research. This chapter aimed to identify how the cultural and ecological structures of New Orleans and New York shaped each city in a certain way to manage their emergency response and communications. Because Hurricane Katrina hit New Orleans in 2005, Sandy is often compared to Katrina. It's also possible that because Sandy hit the northeast at a later time than Katrina hit the southeast, the storm may have been linked to climate change more often because of the rising momentum for climate change consensus.

Theoretical frameworks of Althusser and Foucault point to the roles that power and ideology play over the course of time and political progression. It seems that a noticeable difference in their ideological and political structures is the source of political power. In the case of Louisiana, the oil and gas industry plays a large role in supporting the state's economy, policy incentives and state-wide perception of economic stability, which cloaks environmental externalities like wetland erosion. Political corruption and the neglect of the Army Corps of Engineers to maintain levee systems have contributed to an overall attitude of government distrust. In the case of New York, political leadership is predominantly democratic, and as a global icon of wealth, intellect and innovation, New York also plays the role as a global leader in climate policy. In the aftermath of 9/11, evidence of cynicism toward the government decreased, and while it may be a false stretch to connect climate change with every extreme weather event that occurs, making the connection might increase awareness for what climate change could bring.

In terms of ruling ideologies and power relations, the media have potential to influence perception and public opinion about risks, like sea level rise. There is evidence that the way

certain issues are constructed or framed have an impact on subjective understandings of an issue. In the chapter that follows, a review of the literature on news framing and climate communications explore the possibilities for news media in climate governance – through the implications of social constructionism and careful framing analysis.

Chapter II: Literature Review of News Framing and Climate Communications

Scholars have examined how the framing of news content can influence public attitudes on social, political and economic issues, as well as perceptions of global environmental change. Previous studies on media effects explore the implications of agenda setting and framing, the limitations of journalistic norms as well as science journalism, problems foreseen in an increasingly fragmented and digitized media landscape, and the hegemonic attributes of mass culture (See Bell, 1976; Artz & Murphy, 2000) This section presents a review of some new and classic works done by scholars engaged in media effects and science communications.

Perception, framing & empirical analysis

This purpose of this study is to analyze the framing of news for climate communications, in order to ask additional questions about public perception of the physical world, climate change and the impact of ideology. This study examines two portals to the "the public mind" by making observational analyses from two newspapers, without drawing definite conclusions about neurological perception. As Walter Lippman (1946) suggested in his early writings from *Public Opinion*, a public "perceived reality" is dependent on how emotions relate to available information, how events that make the news are shaped by peoples' reactions, whether individuals "make an issue of them" through action or discussion (p.14).The effects of media on the public mind are the words and images that evolve to create a perceived reality about events that take place somewhere else, echoed in the conversations that people have and subjective imaginations.

Making an issue of these perceived realities, through action or discussion, are the effects of media. From Lippman's point of view, one thing that is problematic about perception (or "the pictures in our head") from media influence is narrative simplicity. Lippman believed that there lied an inability to deal with narrative complexity, because narrative simplicity is easier to communicate on each end quickly (transmission and reception) (Lippmann, 1946). Public action, according to Lippmann, is an effect of narrative simplicity on the public mind. Another way to make sense of narrative simplicity is through the concept of "framing." As will be discussed in depth throughout this section, framing refers to the process in which an individual makes sense out of an event or thing, through emotional connections or memory. Framing occurs in both the transmission and reception of media.

In addition to the way perception is influenced by narrative simplicity and emotional response through mass media, the messages that are chosen by media are the ones deemed "salient" in the news cycle and therefore the public mind. "Agenda setting," coined by McCombs and Shaw (1972) in their study on the coverage of the 1968 presidential election, refers to the way that mass media shape the public mind by determining what the salient issues ought to be. A classic method that puts this theory into practice will analyze political campaigns – examining how candidates and political issues are represented by the media, which influence "the salience of attitudes toward the political issues"(p. 177) Their findings from a content analysis indicate that media aren't solely responsible for shaping the way that people think, but media are responsible for providing the public with salient issues to think *about* (McCombs & Shaw, 1972).

Just a few years following, Goffman (1974) enhanced the idea of how an individual perceives the natural or social world in his book *Frame Analysis*. In his first chapter, "Primary

Frameworks," Goffman suggests that when an individual recognizes a particular event, he or she will interpret or respond to such an event through one or several types of primary frameworks. Goffman notes that these frameworks vary in degree of organizations, specifying that some are a system of entities, postulates and rules, while others may have no apparent shape, "providing a lore of understanding… a perspective." He wrote that whatever the degree of organization, the primary framework "allows its user to locate, perceive, identify, and label a seemingly infinite number of concrete occurrences defined it its terms" (p. 21). What he means put simply is that in any given event, an individual will make sense of the occurrence or information based on their previous experiences – which could be exposure to the social constructions of an existing knowledge base or a primitive response that draws upon emotion.

Goffman elaborates on the idea that there are two broad classes of primary frameworks, including the natural and the social. The biggest difference between these two is a matter of guidance, in which natural frameworks are "purely physical" and unguided, whereas social frameworks encourage "guided doings" (Goffman, 1974). He points to the fact that an understanding of an event in a natural framework can be translated into a more fundamental framework, like understanding conservation of energy or the state of the weather in a given report. By contrast, Goffman considers the newscast reporting of the weather a guided doing. He summarizes these ideas by saying "we tend to perceive events in terms of primary frameworks, and the type of framework we employ provides a way of describing the event to which it is applied" (p. 24). Another example he uses is when a coroner might ask for the cause of death (natural) versus the manner of death (social).

Extending some of these ideas that Goffman put forth on perception through primary frameworks, Entman (1993) also explored the implications of media effects from "an

information processing approach." He argues that media contribute to what people think, precisely because media affect what people think about (p. 347). In his research, Entman investigates how ideology factors into the way people process the information they are provided with, referring to information-processing theory, which suggests that "whether people ignore or pay attention to new information depends more on its salience, on whether it meshes with their interests, than on whether it conflicts with their existing beliefs" (p. 350). Ideology, seen through Goffman's sense of primary frameworks, creates a socially guided doing. By comparing a national survey on American's political attitudes from 1974 and 1976 to an analysis of newspapers with political content, which were read by respondents, Entman sought to test how readership ideology factors into perception of political news. What he found is that readership ideology generally rejects or confirms political content, depending on where the content falls on the scale of their belief system. Where readers did not have established attitudes, editorial persuasion about new topics was more likely to have an impact on those readers' opinions. In other words, on top of newspapers providing readers with salient topics to think about, political ideologies reinforce frames that are perpetuated by media (Entman, 1993).

Pan and Kosicki (1993) distinguish framing analysis from agenda setting as "a constructivist approach to examine news discourse with the primary focus on conceptualizing news texts into empirically operationalizable dimensions – syntactical, script, thematic, rhetorical structures – so that evidence of the news media's framing of issues in news texts may be gathered," (p. 55). Drawing upon Goffman, Pan and Kosicki expand further to explain how public discourse is "packaged," by journalists and policy positions that may emerge out of symbolic devices or frames (Pan & Kosicki, 1993). In other words, journalists produce stories in a way that represents how they frame events themselves, and because of the nature of their job,

this processing of information becomes quick and routine – or what one might consider systematic. In their study, Pan and Kosicki examined the rhetorical significance of syntax and narrative focalizations looking at one news article in Wichita, Kansas, which marked the suspension of the Wichita anti-abortion protest in August, 1991. They coded the article for syntactic, thematic, script and rhetorical structure and developed their analyses based on more than one method for quantifying their data. To construct what they call a "data matrix of signifying elements," they assigned degrees of power to their variables that relied on location in the article and chunking texts, "based on cognitive theories of how the texts are processed and represented" (p. 63). Pan and Kosicki conclude that it is empirically possible to identify and measure the signifying devices of a news text, and that this approach may allow for more research on news framing with cognitive nuance. As they note: "The crucial advance from the agenda-setting research is that framing analysis examines the diversity and fluidity in how issues are conceptualized and consequently allows for more fruitful analysis of the conceptual evolution of policy issues" (p. 70).

Framing analysis extends further to the work of scholars who isolate specific news events and analyze exactly how they are framed by news media. In Iyengar's (1996) study on "Framing Responsibility for Political Issues," he identifies two ways of framing television news coverage on political issues: episodic (event-oriented) and thematic (issue-oriented). In order to investigate how television viewers might perceive responsibility for political issues, such as poverty, Iyengar sought to analyze the relationship between news frames and research participant's perception of whether poverty is a more complex social issue or if it relies on individual responsibility. Iyengar distinguishes the two frames, in which episodic frames depict "issues in terms of specific instances… a terrorist bombing, a homeless person, or a case of illegal drug usage….essentially

illustrations of issues." By contrast, a thematic frame "depicts political issues more broadly and abstractly by placing them in some appropriate context – historical, geographical, or otherwise" (p. 62). Based on his results, he found that media framing does shape attributions of responsibility for political issues, stating "the dominant episodic frame used by television news increased viewers' reliance on individualistic or nonsocietal constructions of political issues, in which the characteristics or motives of private citizens are the most relevant causes or cures" (p. 68). Both of these frames can be considered part of Goffman's "social primary frameworks," and the dominance of episodic framing can be explained by the institutional norm of sensational story-telling.

Chong and Druckman (2007) provide a thorough review of framing analysis practices – why analysis is important, how it emerged and what methods are typically employed. To clarify the distinction between types of framing effects, they explain how issue framing effects (framing of policy or social issues) differs from equivalency, or valence framing. Instead of analyzing news stories for the sake of understanding the communication surrounding a larger issue, equivalency considers "different but logically equivalent phrases that cause individuals to alter their preferences" (p.114). Additionally, they clarify the difference between framing and priming. Priming, which was introduced by Iyengar and Kinder (1987) can be defined as "'changes in the standards that people use to make political evaluations'" (p. 114) . These changes are influenced by television news coverage that calls attention to some matters while ignoring others, so if a subject is exposed to more coverage on energy policy than other issues, then that subject will evaluate a presidential candidate based on how they discuss energy policy. Yet Chong and Druckman suggest that the psychological model of framing can be generalized to priming, noting that when mass communication places attention on an issue, they expect the

"issue will receive greater weight via changes in its accessibility and applicability" (p. 115). The last distinction they make to clarify framing-related concepts is persuasion. Persuasion, not to be confused with framing, occurs when communication alters one's belief about an issue from the pre-existing belief that they had (Chong & Druckman, 2007).

In addition to all the terms and previous works on framing, Chong and Druckman break down all of the steps in quantitative news framing content analysis. These include: identifying an issue; isolating a specific attitude that's prevalent among public opinion; identifying a set of news frames; and selecting sources for content analysis. They state that a "more precise definition of framing starts with a conventional expectancy value model of an individual's attitude" (p. 105). From this point of view, an attitude toward an object is the weighted sum of a series of evaluative beliefs about that object (Chong & Druckman, 2007). An example they use to explain this theory is how an individual might feel about a new housing project: an individual might consider how the project will be good for the economy but bad for the environment, so in this case, the first value is positive and the second is negative, and the individual's attitude will depend on the relative magnitudes of each competing value (p. 105). Pros and cons, in other words, contribute to an individual's (as opposed to a newspaper's) framing of an issue. As the authors note, the majority of attention in the political science and communications literature "has been on how frames in the communications of elites influence citizens' frames and attitudes" (p. 109).

Nisbet (2009) wrote recently on frame analysis with specific attention to the framing of climate change. In his work, he identifies frames based on what he considers the patterns of themes that turn up in climate change coverage, while emphasizing how re-framing climate news could reach a broader audience. In his article, "Why Frames Matter for Public Engagement," he

considers how "successfully" reframing climate change means "remaining true to the underlying science of the issue, while applying research from communication and other fields to tailor messages to the existing attitudes, values, and perceptions of different audiences, making the complex policy debate understandable, relevant, and personally important" (p. 14). In the same way individuals experience framing when processing information, individuals may choose to accept or deny the information that is being broadcasted by poor or quality news companies on climate change.

This kind of thinking alludes to the problem with the deficit model. The deficit model suggests that increasing education about science, or a belief based on true facts, will "fill the deficit" in hope that if the public understood an issue the way experts do, they will see the issue the same way (Nisbet, 2010, p. 51). Yet historically, many climate communicators have focused on increasing the amount of quality news coverage on climate change, and while scientists and advocates anticipated greater public understanding of climate change "quality news coverage is only likely to reach a small audience of already informed and engaged citizens" (Nisbet, 2009). Extending on this idea, Nisbet calls attention to the political polarization of the "two Americas," divided by ideological lines. One reason the deficit model has been contested among scholars in political and social sciences is because of the apparent difficulty in making productive climate change policy, due to split ideological belief systems that accept information about climate change or react negatively to it.

Referring back to Entman's ideas on framing, this idea of an ideologically-split America is reflective: news recipients will reject or accept news, based on whether the information is consistent with their position about an issue or not. Rejecting information about climate change might perpetuate what Lippmann identified as problematic narrative simplicity. Climate change

is often referred to as a "wicked problem" among communicators, scientists and scholars in the social sciences, because it is a complex system of challenges that involves climate science on a global scale, cooperation among political leaders to address the problem (which is hard to do) and careful framing of the issue by communicators who want a mere shot at making a difference. Further, climate change will affect many countries across the world in different ways, from food shortages due to dry farming conditions, to water shortages, to the inundation of coastal cities, all the while raising questions about social justice and who should be held responsible. Though developed countries are most responsible for the historic record of carbon emissions, it is the developing world that will suffer the most.

Climate communications and the media institution

The study of climate communications should begin with consideration of how, precisely, nature is viewed in the public mind. Considering theories of social constructionism and nature, a media analysis for the representation of climate change might be viewed with greater nuance. For example, John Hannigan (1995) considers environmental issues from a this framework, suggesting that environmental issues "do not materialise by themselves; rather, they must be 'constructed' by individuals or organisations who define pollution or some other objective condition as worrisome and seek to do something about it" (Hannigan 1995, p. 2). By this he means that human understandings of environmental problems are manifested by the people who have a voice to make environmental claims, either through institutional positions of power or by political worthiness of the claim. In the political realm of climate science, the claims-makers encompass a collection of climate scientists, advocates for climate policy, climate contrarians, economists and global institutions. With consideration of Goffman, these institutional norms

might impact an individual's primary framework process while making sense out of an event or object.

Yet the social constructions of climate change are not limited to science and politics. Cultural norms play a massive role in the way individuals view the natural world, including a culture's language, literature and rituals. In William Cronon's (1996) essay "The trouble with wilderness, or, getting back to the wrong nature," he explores how society has come to define nature, specifically looking at the meaning of the word "wilderness." Cronon argues that wilderness has traditionally been treated as a separate place from society. In America, the wilderness was where people would go to escape the ills of a modern world, finding serenity in the untouched landscape most commonly offered out west (Cronon, 1996). The problem with viewing wilderness as the "wild other" to a "tame society" is that nature becomes something in opposition of people. It is worth considering a historical context of the discourses surrounding the natural world, because these contextual qualities have encouraged a more anthropocentric view of nature, which is one reason for the lack of consensus that the climate could conquer humans before humans legislate or innovate their way out of climate change.

Hannigan (1995) draws upon social constructionism as an analytical tool to evaluate the concept of environmental claims – "the claims themselves, the claims-makers, and the claims-making process" (p. 34). He also considers the controversy surrounding social constructionism, pointing to some analysts who warn that this theory may run the risk of ignoring real time problems in society. Yet there is value in acknowledging the relationship between the environmental and political economy. For example, Hannigan points to the important role that scientists and medical professionals play in creating societal claims, while others might stress the importance of "politicians, public interest law firms, civil servants whose careers are dependent

upon creating new opportunities, programmes and sources of funding, etc." (Hannigan, 1995, p. 37). All of these professionals in society have a voice that resonates to certain populations. Additionally, all of these professionals represent an area of expertise that may be of symbolic significance when it comes to environmental information. An example of this might be a medical professional's claim on how the toxic waste stirred up from Hurricane Katrina impacted public health versus an ecologist's claim about how the storm devastated the already eroding marshlands, making New Orleans even more vulnerable to rising sea levels and hurricanes. Each claim would resonate differently.

Sharing information in a way that tells a story – with characters, a problem and a solution – makes information more accessible and interesting to readers, and the media's response to consumer attention cycles enhance media companies' capabilities to maintain interest. There are other journalistic "norms" within the institution that have been established to keep consumer attention high, to keep news "new," and traditionally, to balance "truth" with an objective lineup of sources. Boykoff (2010) identified several limitations of the media institution that might influence the transmission of truthful content, including bias through objective reporting on climate change, pressing deadlines that might affect in-depth reporting and journalists' selective processes for choosing who to quote.

In his study on climate denier representations in media following the climategate scandal, Boykoff (2010) examined how journalistic norms affected coverage of the climategate scandal in 2009. Media professionals, the stories that fit into their agenda and environmental beat, and who pays, edits, and publishes their stories all factor into the construction of a finished news article. As Boykoff states in his paper, "Which voices gain access to and are amplified through mass media – as well as how – are shaped by related elements of access and influence. Thus, mass

media give voice to climate change itself by articulating it via selected 'experts', 'claims makers' or 'authorized definers'"(p. 4). In addition to the writers, their story beat, and their publication, media professionals must choose who to quote, how that person's expertise relates to an issue, how the issue might raise controversy and therefore public interest, and again how those who are quoted represent meaning to the public.

With consideration of theoretical perspectives, an Althusser-influenced point of view might consider how the "rules of order" within the institution, or the expectations of the journalist worker, drive the transmission of truth and therefore an ideological understanding of climate through the media lens. Considering Foucault's governmentality framework, the privileged sources who are assigned power positions based on their semiotic significance of a title (like politician, scientist, etc.) are handed the responsibility to speak for the climate. Power of title resonates in mass communication, and the quotations selected by the journalist take on the role of truth-telling power (whether or not that "truth" is contested). Selected quotations become the salient comments made. News coverage on environmental topics might be framed by a few possibilities. Power relations, narrative story-telling, and journalistic limitations are among them. As Boykoff mentions, pressing deadlines and a need to be "objective" impact the final version of news stories (pp.3-4). Using the climategate scandal as an example, outliers were given a space to extend their case, a direct result of journalists jumping on a story that feeds controversy. The word "skeptic" alone perpetuates an awareness of climate contrarians and deniers, whose voices are heard in a journalist's attempt to be "objective."

In addition to political power, power relations between risk, industry information and local people might also impact how environmental news is received. In his study exploring the relationship between risk industry and local journalism, while analyzing news coverage on

petrochemical industries in Spain, Castelló (2010) concluded that corporate industry plays a role in suppressing risk information. Similar to the way Tidwell (2010) pointed to the limited media attention there has been on Louisiana wetlands out of fear for putting industry in a negative light, Castelló addressed where public relations come in. In general, information about risk gets suppressed by PR companies, aiming to enhance the image of their corporate clients in the public eye. A prime example of this was seen after the 2010 BP Oil Spill, when BP's PR campaign launched a series of commercials about what they've done to respond to the spill, and how seafood and tourism was thriving along southern Mississippi and Louisiana. Because some journalists get their information from press releases and PR professionals, the truths about risk and industry might sometimes get lost down the transmission line.

Additionally, Castelló observed that "a broadly shared professional criterion is that journalism is based on events explained from the perspective of the present but influenced by historical discourse in regard to the specific risk" (p. 465). Because news stories rely on what people know and understand, what their framing process will be, it's questionable that risk is always communicated accurately in order to make information relatable. In other words, sometimes news stories on a risky topic (i.e. industry impacts on the environment, or implications of climate change) will "dumb down" the information. This is a journalistic norm that isn't all that "bad" if reaching a broad audience is the ultimate goal. Yet Castelló's findings showed that the newspaper reports on risk industry either played down the negative effects by ignoring jargon, or camouflaged the information by including jargon and pushing readers away (Castelló, 2010).

Risk is also perceived in terms of immediacy and personal impact. For example, in studying how social and environmental problems are positioned within the arenas of public

discourse, Hannigan's (1995) work suggests that medical issues generally gain traction in the public news arena because of their social implications, as opposed to their scientific significance. As he wrote, medical issues "derive much of their rhetorical power from moral rather than factual argument… By contrast, environmental problems… while morally charged, are tied more directly to scientific findings and claims" (p. 38). This statement relates to some of Walter Lippman's early writings on public opinion and the public's perceived reality that's dependent on how emotions relate to available information. According to Lippman (1922), events that make the news are shaped by peoples' reactions, whether individuals "make an issue of them" through action or discussion (p. 15).

The way that medical issues resonate in public news arenas more than the environment can also be understood with consideration of Anthony Downs' (1972) "issue-attention cycle." How environmental issues gain resiliency is based upon how immediately they may impact society. In his essay, "Up and Down with Ecology: The 'Issue –Attention Cycle,'" Downs addressed how the immediate impact of an issue will affect readers' response, which is why stories about the environment are less likely to keep the public interest engaged. In his paper, he predicts "the bundle of issues called 'improving the environment'… will be eclipsed at a much slower rate than other recent domestic issues," (p.33). Though it is urgent to reduce the level of carbon emissions in the atmosphere in order to mitigate the impacts of climate change, the urgency is hardly visible to the public eye.

Yet climate change does become more visible when extreme weather conditions occur, such as drought, storms and flooding. Downs defines what he calls the "dynamics of the 'issue-attention cycle,'" which include: the pre-problem stage; the alarmed discovery and euphoric enthusiasm; gradual decline of intense public interest; and the post-problem stage (Downs,

1972). As Downs suggests, only certain issues will enter the attention cycle, while others keep public interest more consistently. The issues that do enter the attention cycle are ones in which the majority of people in society are not suffering (compared to a minority), the sufferings of a problem are an effect of social arrangements that provide benefits to either a majority or powerful minority, or that the problem has no "intrinsically-exciting" qualities, or they fade with time (Downs, 1972). Though this piece was written in the 1970s, it does shed some light on the type of news that the public will engage with on a broad scale. Yet as will be discussed, the model doesn't account for external social, political and meteorological events.

Considering Downs' identified attributes to news that enters the issue-attention cycle, climate change can be considered in this context. The drama related to climate change typically revolves around politics, which pushes some people away, it suggests putting a price on carbon, which might threaten tax payers, and it certainly affects developing nations (a global "Other") and poor coastal regions the most. Climate change is susceptible to the ups and downs of the "issue-attention cycle," and it has become the most covered environmental topic that dances across multiple beats, including science, policy, lifestyle and the economy. But climate change is not a sexy topic. It offers no direct or immediately visible benefits to individuals, the only place where fingers can point to blame is at powerful nations like the United States, and it asks the world to change their practices and lifestyles. Urgent as it may be, framing the issue with urgency pushes some media recipients away, especially if the topic already clashes with their existing position on climate change.

Downs (1972) argues that the media coverage of environmental topics tends to reinforce the cyclical patterns of the issue-attention cycle. Here it's worth considering Althusser's idea of a "ruling order" through the reinforcement of certain practices, like the media institution's

tendency to move onto new stories when a topic is no longer new or enthralling. As McComas and Shanahan (1999) write, "Dramatic media portrayals of the issue may capture public attention, but after a while, intensive media coverage… may threaten certain audiences and begin to bore others" (p. 31). Climate change is also a topic that doesn't just get resolved. At least there has been no "solution" yet.

It is a topic that took years of political debate (especially in the U.S.) and scientific reporting to finally get a spot in the media light, and now public attitude generally leans one of four ways: political leaders must do something to curb carbon emissions immediately in order to avoid climate catastrophe; a radical attempt to curb emissions through new policy will be expensive, so the approach must be fiscally rational; humans did not cause climate change and environmental policy limits growth, so business as usual is the way to go; or, it's too late – why all the expense if we've reached the global warming threshold? These are the "narratives" that climate communicators work with and what resonates as "new" is typically information about international agreements, discovery about ice-core research, carbon trading or taxing, a radical opinion about climate change that comes from a scientist, celebrity or contrarian, and extreme weather events. When these events occur, climate change re-enters the headline cycle, but it won't resonate with every person out there, and it will drop until the next "event" occurs.

There are some criticisms of the Downs model. Drawing upon Hilgartner and Bosk's (1988) critique that the Downs model is too linear, McComas and Shanahan (1999) address how the model doesn't include the possibility of other social and institutional matters, like a school shooting that takes over the news, or campaign coverage for a presidential election. Hilgartner and Bosk argue that instead of moving linearly from one stage to the next, social matters that simultaneously exist have an impact on news (Hilgartner & Bosk, 1988). Similarly, Ungar

(1992) challenges the issue-attention cycle model stating that public interest in climate change is impacted by "concatenating physical impacts" like the drought of 1988 (Ungar, 1992). In other words, public attention for climate change is transient, similar to the transient behavior of weather patterns and often in-line with these patterns. Another paper by Greenberg et al found that television coverage of environmental risk is driven more by the dramatic value of a story, rather than the inherent risk of a problem (Greenberg, Sandman, Sachsman, & Salomone, 1989). These are not new insights for media studies scholarship; it is well-known that a juicy story gains more exposure to the masses (and money for the news companies) than something that's intangible and doesn't affect a population until drought, natural disaster or the next century arrives.

In their study, McComas and Shanahan (1999) distinguish narratives from frames and "scenarios," stating that the key difference is that narratives use a temporal order of events to construct meanings. They suggest that narratives are relevant when discussing "the flow of coverage over a specific time interval" (McComas & Shanahan, 1999, p. 37). Because the authors wanted to know whether narrative factors explain "Donwnsian" cyclical change in media coverage of global warming over time, they performed a content analysis that was designed to examine "the narrative structure of the cycle of national newspaper coverage"(p. 38) What they found is that newspaper attention to climate change (among the *Washington Post* and the *New York Times*) notably increased in the late 1980s before it began to decline through 1995 (McComas & Shanahan, 1999). They coded for several themes, which this study draws upon: new evidence or research, general science background, controversy among scientists, consequences of warming, economics/costs of remedy, domestic politics, international relations, and current weather (Appendix 2), they found that new evidence and research was the most

frequent "primary focus" in the articles that were coded. Further, different themes were dominant during different phases of the cycle, and the narrative frameworks reflected these trends. Considering the cities New York and New Orleans, it is possible that Hurricanes Sandy and Katrina largely influenced the frequency of news articles on climate change.

In today's changing climate and mass communication sphere, the relationship between climate and the media is one that offers many avenues for further research. Newspaper analyses of climate change coverage have become widely researched among scholars, examining: ideological spins, the impact of reporting climate contrarianism for the sake of "objectivity," journalistic norms, evolving practices in a fast, image-based media landscape and the limits of communicating complex science through this changing media landscape. Boykoff and Yulsman (2013) address such challenges by expanding on the political economy of media and climate change in an also changing news industry. They address how corporate ownership of media changed traditional values of journalism, like keeping political leaders in check through freedom of the press, for example.

Drawing upon McChesney's (1999) criticisms of today's media institution in his article "Rich Media, Poor Democracy: Politics in Dubious Times," Boykoff and Yulsman call attention to the profit motivations and press relations with special interest groups. Interestingly, while print advertising revenue and staffing in newsrooms dramatically began to plummet in 2006, profits at many large newspaper companies did not. In their discussion of the investigative PBS documentary *Exposé*, Boykoff and Yulman explain that profitable newspaper companies were in fact squeezing money from their newsroom budgets to secure profitable revenue. Some smaller news companies have been forced to cut staff or even shut down (like *Rocky Mountain News*). With less staff to cover all the stories that are out there (that satisfy readers' attentions), and less

of a budget to fund reporters for travel and other expenses, long-form and in-depth investigative reporting, along with science journalism, have suffered. Additionally, because "science reporters" are seeing less space in the news room budget, climate change news gets clumped to other beats, like politics or the economy. This is good and bad. There are obvious problems with cutting a science news desk, because the media institution will thereby discontinue its practice that calls upon "experts" of science reporting to cover science or the environment. On the other hand, reporters who used to cover the environmental beat and now cover politics may find opportunity to weave their expertise into political stories, framing climate news in a way that spins it politically, possibly reaching a broader audience.

The social constructions of climate change rely on political action, public engagement, extreme weather events that get linked to the "new normal" or "impacts of climate change," and, therefore, how the issue gets framed. Considering a social constructionist approach, humanity's perception of the environment has been influenced by social institutions like ritual, the imperial nature of "exploration," literature, art, industry, policy, and the media. Perceptions of the environment are also adaptive, and in contrast to the notion of "wilderness" that might have influenced perception of nature in the past, at-risk communities now embrace terms like "climate resilience," "flood protection" or "adaptive capacity." On a global scale, "climate policy" may resonate with a certain definition for the natural world across rural, urban and suburban landscapes. It is also important to consider the way social meanings are generally voiced by those in positions of power, or framed in a way that's more appealing. All of these realities depend upon the voices being heard – the result of power positioning, institutional ideologies, and the narrative ways of explaining it all through drama, a target audience, and deadlines.

Given the current landscape in the midst of global climate change and evolving media platforms, it is crucial for communicators to understand what exactly framing does and can do, given social and political circumstances like culture, ideology and scientific literacy. In Nisbet's (2009) article, he draws upon the work of cognitive psychologists and 1970s Nobel Prize winners for their research, Daniel Kahneman and Amos Tversky. What the researchers discovered is that perception is reference dependent, based on their experimental design that used framing to understand risk judgments. Kahneman and Tversky found that if individuals are put in an uncertain situation to handle, different responses occurred when messages were presented or framed differently to describe the problem (Nisbet 2009).

As Kahnman (2003) writes, "Perception is reference-dependent: the perceived attributes of a focal stimulus reflect the contrast between that stimulus and a context of prior and concurrent stimuli" (p. 1454). Depending on the terminology or the visual context in messages that Kahneman and Tversky used, responses did vary. Kahneman notes that this experiment led to their development of "prospect theory," which is concerned with short-term outcomes, where the "value function presumably reflects an anticipation of the valence and intensity of the emotions that will be experienced at moments of transition from one state to another" (p. 1457). In other words, Kahneman and Tversky's work revealed that an anticipated emotional experience will impact behavior, and perception of an event does rely on the contrast between prior and current stimuli.

This research can be useful while considering the way climate change is framed in mass media and public policy. If the increase in quality news coverage on climate change does nothing to impact perception, then perhaps strategic framing of the topic will. As Nisbet (2009) writes, "For many members of the public, climate change is likely to be the ultimate ambiguous

situation given its complexity and perceived uncertainty" (p. 16). Much of Nisbet's work on the framing of climate change examines what common frames are out there. Frames work when they link two concepts to an intended audience, like "climate change will have consequences," for example. Yet frames won't work if they are framed poorly or are irrelevant to an audience's preexisting interpretations (Nisbet, 2009).

In his article "Knowldege into Action," Nisbet (2010) stresses the fact that developing a framing strategy should be approached deductively and inductively, calling attention to some of the reoccurring frames across policy debates, like "public accountability" and "progress." These have been used in the reporting of nuclear energy, food and medical biotechnology (Nisbet, 2010). As an extension of this research, Nisbet identified several more frames that are commonly seen in coverage of science policy debates, including climate change. In each article cited, Nisbet includes a table that lists the frames he identified and how each "define" a particular science-related issue. They include: social progress, economic development/competitiveness; morality/technical uncertainty; Pandora's box/Frankenstein's monster/ runaway science; public accountability/governance; middle way/alternative path; and conflict/strategy (Nisbet, 2009) (Nisbet, 2010, Appendix 1). These frames speak to individuals of varying ideologies, in which they will either accept or reject the news. For example a "Pandora's box" might resonate with radical environmentalists, but it is strongly rejected by individuals who are uncertain about climate change. Comparatively, framing climate change as "uncertain" will appeal to those who lean on the denier scale.

These frames encourage ideological views by pushing individuals one way or another, depending on their perspectives. Yet, as addressed by Boykoff (2010), to further "balance" climate change news is problematic, because even the inclusion of a denier's perspective

distracts readers from the urgency that climate change demands. It might be more useful for the liberally-inclined, climate change advocates, scientists and journalists who cover climate change to address the issue in a manner that's compromising, non-confrontational, strategic and smooth. If the news about climate change is going to resonate through a reader's framing processes, a framework that is strategically inviting, without diluting honest facts, will be the most effective. Like the art of negotiating, one way to do this is through framing analysis and, consecutively, framing. Some scholars who have previously used a content analysis methodology for the purpose of analyzing climate change news include: Carvalho (2007), McComas and Shanahan (1999), Brossard, Shanahan and McComas (2004), Zamith, Pinto and Villar (2013), Boykoff and Boykoff (2004) and Boykoff (2007, 2008, and 2013).

Carvalho's (2007) study addressed ideological cultures and media, analyzing British "quality" press and scientific coverage. Considering *The Times*, *The Independent* and *The Guardian*, Carvalho found that coverage of IPCC reports and climate change were executed differently across publications and over time, based on their ideological spins. Drawing upon Beck (1992) and Gamson (1999), Carvalho points to the need for media and scientists to work together, in order to "translate," broadcast and "validate" the facts that scientists make public so that the public may better understand them (Gamson, 1999, p. 23). Carvalho wrote that her study illustrated "a crucial cross-insemination between the normative and the descriptive, or the axiological and epistemological in the media's discursive reconstruction of science" (p. 237). In other words, the varying scales of ideology will interpret (or frame) the facts differently, and "reconstructions of science" will vary down the transmission line based on institutional ideology. Obvious examples of this in the United States include television networks *MSNBC* and *Fox News*. In sum, her study enhanced the ideas projected earlier by Entman (1989, 1992), that

ideology works as a "selection device" in choosing what is scientific news and which "authorized 'agents of definition' of science matters" (Carvalho, 2007, p. 224).

Boykoff (2007) also examined coverage of climate change in the United Kingdom, offering a comparative analysis to news reports of anthropogenic climate change in the United States. Similar to his work previously mentioned, Boykoff's study addressed the journalistic norm of "balanced reporting," in which an effort to be "objective" might dilute some truths about climate change. Boykoff analyzed a sample of newspaper articles from quality British and U.S. press, between 2003 and 2006 for the purpose of recognizing trends in the coverage and evidence of biased accounts through journalistic norms. Peaks in the coverage of anthropogenic climate change, he noted, were largely associated with certain events like the Stern Review (October 2006), a review on the economics of climate change, COP12, the Twelfth Conference of the Parties to the United Nations Framework Convention on Climate Change, release of *An Inconvenient Truth* and media coverage of US federal climate policy "through the news hook of mid-term Congressional elections" (p. 4).

In addition to the dramatic increase in newspaper coverage of anthropogenic climate change in each country, Boykoff's results showed an evolutionary shift in biased reports of climate change through the journalistic norm of objectivity in U.S. newspaper coverage in 2005. The explicitly "balanced" reporting of climate change began to frame coverage more in terms of scientific consensus that climate change is related to human use of fossil fuels (Boykoff, 2007). In his discussion, Boykoff recognized how political and scientific/meterological events contributed to the trends in coverage and the deviation from biased "objectivity." This study is reflective of the work done by McComas and Shanahan (1999), in which the authors recognize

how social, political and meteorological events add nuance and contest the linearity to the "issue-attention cycle" (Downs, 1972) for the coverage of global climate change.

Similarly, Brossard, Shanahan and McComas (2004) compare coverage of global warming in France and the United States from 1987 to 1997, noting that France's coverage is more "event-based" and focused on international relations. The authors discovered that U.S. coverage of climate change put more emphasis on the "consequences of global warming," and the coverage presented a wider range of viewpoints, whereas French coverage presented a more restricted range of viewpoints (giving less voice to the policy "experts" who contest anthropogenic climate change) (Brossard, Shanahan, & McComas, 2004). Also, looking at cross-cultural comparison, Zamith, Pinto and Villar (2012) examined a "North" versus "South" story, looking at the coverage of climate change across the Americas. The authors noted that "Comparative research across regional media offers an avenue to explore the nuances in mediated cultural contexts that may play particular roles in shaping news coverage of climate change" (Zamith, Pinto, & Villar, 2012).

Calling attention to the rich cultural context of Latin America, they also considered how the region is particularly vulnerable to climate change. In their study, coders used an instrument based upon Nisbet's (2009) eight defined frames that are common in the coverage of climate change as well as Brossard et al's (2004) degrees of presence for these themes. The authors found that there was significant variation in the "social progress" theme among Latin American newspapers, and that the *New York Times* placed more emphasis on the "economic development" and "scientific uncertainty" theme than Latin American newspapers. Additionally, two of the Latin American newspapers (Costa Rica and Colombia) framed their stories according to the "Pandora's box" theme, in comparison to the *New York Times* and Brazilian newspaper, *Fola de*

Sao Paulo. It is worth taking this study into account, because the two less-circulated newspapers, representing regions of less political power, were more likely to frame climate change with urgency and possibility for social change. By contrast, the two more-circulated papers from more powerful regions focused on economic development, scientific uncertainty and governance.

With consideration of Althusser's theory on ideology, the results from this study reflect cultural attributes or "rules of order" like humility and a concern for public safety (urgency and social progress), versus power and skepticism (economic development and scientific uncertainty). Foucault's framework of governmentality might also be considered, shedding light on the power dynamics between all of these countries. On a global scale, the wealthier countries are more responsible for the effects of climate change and face a less urgent need to reduce the impacts of climate change. The two Latin American countries that frame their climate change news stories in terms of urgency are in relatively helpless positions to curb the impacts of climate change, and in response, these countries resort to more "sound the alarm" reporting method.

The purpose of this study, though, is to analyze the framing of climate change over the past decade through comparison of two U.S. newspapers, examine if natural weather events impact the primary frameworks employed by journalists, and evaluate what role print journalism has played in perpetuating the existing ideologies. In addition to Nisbet's outline of commonly observed frames in the coverage of science policy, the research drew upon the work of Brossard, Shanahan and McComas (1999; 2004) to develop a clearly defined list of frames that were coded for and compared across the *New York Times* and the *New Orleans Times Picayune*. The following section presents a content analysis, comparing these frames.

Chapter III: The News of the Two Cities

Because New York City and New Orleans are both regions of the United States that are vulnerable to climate change induced sea level rise, and because they are regions that represent different ends of the political ideological scales, it is worth analyzing their news. The *New York Times* is a world renowned newspaper company and one of the most widely circulated across the country. It is a nationally circulated newspaper. Comparatively, The *Times Picayune* is local to southern Louisiana and the New Orleans metro area, and it is a regional newspaper. Though New Orleans is often said to be a "liberal oasis" in the heart of the South, readership of the *Times Picayune* is relatively more conservative than readership of what's generally categorized as the liberal *New York Times*. At the same time, these two American cities of extremely rich heritage and history are located in regions that are predicted to be some of the most at risk for sea level rise.

Similar to the study published by Zamith et al (2012), the difference in climate change coverage between New York and New Orleans is a North-South story, but on a regional as opposed to global scale. The level of poverty is significantly higher in New Orleans compared to other U.S. cities (York & 10003620-4230, n.d.), and "two-thirds of African-American kids under the age of 5 live in poverty" in New Orleans (Abramsky, 2013). While there is a considerable amount of poverty in New York City, New York is also recognized for its intellect, power and number of billionaires who reside in the city. The *New York Times* reaches over a million subscribers, and the *Times Picayune* reaches over 81,000 ("Top 100 Newspapers," 2013). The median age for *New York Times* readers is 51, of which 61% are college graduates, and the median household income is $98,795 ("Audience Overview," 2013). Comparatively, "71% of

adults in the Greater New Orleans area read the *Times Picayune*," the mean household income for readers is $68,000 and 70% are college educated ("NewOrleans and Baton Rouge Target Audience |," n.d.). The solid majority of registered voters in New York are democratic (as well as New York City), and in Louisiana, the majority of voters are Republican. New Orleans is more democratic than the rest of the state, yet since Katrina, a decline in the black population of registered voters contributed to a recent increase in white republican leadership (2010). Additionally, the number of individuals who are registered with no party affiliation in Louisiana is growing (Shuler, Marsha, 2014). So, by comparing cultural ideology and demography in the United States, this study is a North-South story about America, within the larger context of the Global North or Annex I countries.

Given their vulnerabilities and differences, this study seeks to analyze each region's print journalism of a specific climate change "symptom." Because each region is vulnerable to sea level rise, that is what the chosen population of articles for analysis is based upon. The following section provides a quantitative study through content analysis of the *New York Times* and the *Times Picayune*.

Research Questions and Hypotheses

Three research questions sought to analyze how the coverage of sea level rise might use any dominant framing practices that are common for the coverage of climate change. Also, with consideration of the Downs (1972) "issue-attention cycle" and arguments that contest it, this study sought to track patterns of coverage on sea level rise across time, with interest in the impacts of Hurricane Katrina and Hurricane Sandy on media attention to sea level rise.

R1: When discussing sea level rise, how do articles in the *New York Times* compare to those of the *Times Picayune* from 2004-2014, in their use of common climate change frames?
R2: Did Hurricane Katrina encourage greater or less use of common climate change frames in articles about sea level rise in the *Times Picayune* over time?
R3: Did Hurricane Sandy encourage greater or less use of common climate change frames in articles about sea level rise in the *New York Times* over time?

Reasons for an increase in climate change coverage since Hurricane Sandy might have included the impact of Hurricane Katrina on the issue-attention cycle, culture and political structures. Because of the city's history in political corruption and doubt in governmental authority, it was expected the *Times Picayune* would frame their news most heavily in terms of public accountability. Comparatively, it was expected *The New York Times* would be much more grounded in science because of its progressive, intellectual, and resourceful reputation. Further, it was expected that because Katrina was used as a reference point in coverage of Hurricane Sandy, Hurricane Sandy would trigger use of common climate change frameworks, especially with an emphasis on future consequences. Therefore, hypotheses for this study included:

H1: The *Times Picayune* frames their articles more heavily in terms of public accountability in comparison to *The New York Times*.
H2: *The New York Times* frames their articles more heavily in terms of scientific background in comparison to the *Times Picayune.*
H3: Hurricane Sandy triggered greater use of common climate change frameworks, especially with emphasis on the consequences of climate change.

Content Analysis, Population & Sampling

While previous scholarship has compared the coverage of climate change among widely-circulated U.S. newspapers and widely-circulated papers internationally, it is rare that national news is studied against regional news. In order to compare the framing of sea level rise between these two newspapers, a content analysis was chosen for this study. This methodology is typical for the study of texts, like books, magazines, television, web pages, poetry, newspapers, laws, etc. (Babbie, 2012). With intention to add to the research that's been done by previous scholars on the reporting of climate change and framing, this study offers a unique angle through comparison of two cities in the United States that are both at risk for sea level rise and have not been comparatively analyzed against one another before. Further, there have been many studies that textually analyzed the media coverage of Hurricane Katina, with specific attention to the framing of hurricane victims as "savagery," exposing clear racial disparities across broadcast TV networks (Daniels et al., 2011), but there are no content analyses for the coverage of climate change in southern Louisiana to date.

In order to answer the research questions, articles from the *New York Times* and *Times Picayune* were collected, using the search term "sea level rise." The search term was chosen in order to limit the articles to a more regional issue related to climate change, but this did create limitations to the research that will be discussed later on. Collected articles fell within the date range January 1, 2004 – January 1, 2014, using *Factiva* through the University of Colorado's library databases. These dates were chosen to reflect a time scale that was one year before Hurricane Katrina hit New Orleans and one year following Hurricane Sandy. By doing this, 308 articles turned up: 116 were from the *New York Times* and 190 were from the *Times Picayune*. The initial population included everything – letters to the editor, editorials, op-eds, and some

stories that were not relevant to sea level rise. With interest to include all texts that were published by the newspapers, in order to reflect how sea level rise was framed as a publication, all texts were included except duplicates or those which did not appear relevant to sea level rise. For example, the *Times Picayune* trivia questionnaire "Marsh Madness" (a reader contest to test their knowledge of Cajun culture) was eliminated. Additionally, articles that were less than 200 words were eliminated, because they only provided about two paragraphs to code for syntactically. The reason editorials, opinion, and letters to the editor were included was to fully reflect the culture of each newspaper, in which the newspapers represented a subsample of each region's population of culture. The final count for articles within the collection came to 230, including 103 from the *New York Times* and 127 from the *Times Picayune*. All articles from the defined population were included. Because the entire population was studied, no sample selection was required.

Variables and Operationalization

Based on all of the previous studies and analyses, the research methodology considered: the framing of climate change; the narratives and syntactical structures that reveal the salience of frames; the impact of extreme weather events on the news cycle over a ten year timescale; and a cross-cultural comparison of two U.S. regions and newspapers.

In order to identify variables and operationalize data from the collection of articles, this study drew upon the work of Nisbet (2009 and 2010) as well as McComas and Shanahan (1999) and Brossard et al (2004). In their cross-cultural comparison of media coverage of global warming, Brossard et al identify the salient themes used by journalists, similar to the work mentioned by Nisbet. The themes that Brossard et al use for their analysis include: New evidence

or research presented; Scientific background; Consequences; Economics; Domestic politics; International relations; and Current weather (Brossard et al., 2004). (For list of every definition, see Appendix 2) The researchers coded for these themes based a scale of presence, in which they took count for themes if they were "not present," "present," or "outstanding focus, or appearing in the lede" (p. 367).

Because the purpose of this study was to test for the differences in frames by comparing the *New York Times* and *Times Picayune*, while considering the impact of hurricanes on the news, the variables tested were "theme," "degree of importance," "newspaper" and "time period" in which the article was published. Each newspaper article was a unit of analysis, or individual unit which this study sought to make descriptive and explanatory statements about (Babbie, 2012).

Inspired by previous scholarship, themes were first operationalized as nominal variables with the following categories: "public accountability and governance," "scientific background and causality," "forecasts, prediction, scientific uncertainty," "economics," "consequences" and "social progress." In addition to these themes, a framing variable to track "episodic" or "thematic" news frames was included initially (Shanto Iyengar, 1996 and S. Iyengar & Simon, 1993). The intent was to track whether causality and responsibility for the risks of climate change were present in chosen articles, and if so, if there was a relationship between the most salient themes and Iyengar's notion of event-oriented or issue-oriented framing. However after a pilot study with a second coder, a graduate student at the University of Colorado, this variable yielded very low coder reliability and was eliminated. Additionally, the theme "forecasts, prediction, and scientific uncertainty" was eliminated for the same reason. The final list of categories that were used in the study was defined as follows in Table 1:

Table 1: Typology of themed variables to code

Public Accountability	Serving the public interest. Emphasizing issues of control, transparency, participation, responsiveness, or ownership; or debate over proper use of science and expertise in decision-making. Reference to governmental success or failure in relation to climate change.
Scientific Background	General scientific and/or technological background of an issue, like description of previous research, summary of "known" results and findings, scientific explanation of weather events. This happened because____. This is happening because_____. Coming from scientists or study. This equals that.
Economics	Costs of remedy or solutions to counter effects of climate change/sea level rise in each region. Any reference to money.
Consequences	Bad things that will or have happened because of climate change (not consequences of poor governance). Science-induced consequences of climate change/sea level rise. Predictions and projections. Including words like "threat."
Social Progress	A means of improving quality of life or solving problems; an emphasis of harmony with nature instead of mastering it. Social progress = a positive frame. "The restoration project." "Greening the city."

The variable "degree of importance" was operationalized as follows: a 6 was given to a theme appearing in the headline; 5 = in the lede; 4 = in the first paragraph (after the lede); 3 = in the second paragraph; 2 = in the third paragraph; 1 = in the fourth paragraph or anywhere further down; and 0 = not present at all. If a theme within the article was coded for "6," that was the total value recorded, as opposed to adding up each occurrence further down. In other words, assigning value to the theme's first utterance in the article was mutually exclusive from any repeated utterances. This effectively measured the degree of importance but did not count for a total presence of the theme, which did create limitations for encompassing theme presence throughout an entire article.

Table 2: Operationalization for degrees of importance

Placement of theme in article	Ordinal value
In the headline	V = 6
In the lede	V = 5
In the first paragraph	V = 4
In the second paragraph	V = 3
In the third paragraph	V = 2
In the fourth paragraph or further down	V = 1

The variable time period was defined as: "Pre-Katrina" = one year before Hurricane Katrina, starting with January, Jan. 1, 2004 – Aug. 22, 2005; "During Katrina" = the days since Katrina was announced by meteorologists through landfall and breakage of the levees, Aug. 23, 2005 – Aug. 30, 2005; "After Katrina" = one year following, Aug. 31, 2005 – Aug. 31, 2006; "Between Katrina and Sandy" = the years in between, Sept. 1, 2006 – Oct. 21, 2012; "During Sandy" = the days since Sandy became a "hurricane" and through immediate aftermath, Oct. 22, 2012 – Oct. 31, 2012.; and "After Sandy" = the year following through January, Nov. 1, 2012 – January 1, 2014. "Themes" and their "degrees of presence" were tested separately against "newspaper" and "time period." Because there were so many articles published between Sept. 1, 2006 and Oct., 21, 2012, operationalization for the variable "time period" was revised in order to represent results more evenly across time scales. Categories for "time period" were then defined as follows (Table 3):

Table 3: Typology of time categories

Date Range	Category	Nominal Value
Jan. 1, 2004 – Sept. 1, 2008	One year before Katrina and 3 years after	V = 1
Sept. 2, 2008 – Dec. 31, 2010	5 years after Katrina	V = 2
Jan. 1, 2011 – Oct. 21, 2012	6 years after Katrina, one year before and during Sandy	V = 3
Oct. 22, 2012 – Jan. 1, 2014	The year after Sandy	V = 4

Intercoder Reliability

Beginning with the categories of "themes" and "degrees of importance," a sample of 38 newspaper articles were tested by a second coder and myself, split evenly among the *New York Times* and *Times Picayune*. This amount represents 16% of the tested population, in which the first 10 were tested and discussed for trial purposes. Without inclusion of the first 10 articles, in which results were changed upon discussion of agreement, the sample for intercoder reliability represents 12 % of the total sample. The sample to test for agreement was chosen by selecting articles randomly, encompassing articles throughout the ten years that the entire population represents. During the initial stages of testing, there were problems with agreement among categories "Scientific background," "Forecasts, prediction, uncertainty," and "Consequences," due to the fact that there are cross-overs in their definitions. To increase the reliability rate, the category "Forecasts, prediction, uncertainty" was eliminated. Some attributes of the eliminated category were added to "Consequences," and each category "Scientific background" and "Consequences" were more clearly defined. To eliminate subjective positions on "Economics," it

was agreed that any mention of money would be counted. Additionally, any mention of the word "restoration" was included for category "Social Progress."

In addition to the revised terminology for "themes," tracking Iyengar's concept of episodic versus thematic framing was eliminated. Our results for this coding method varied drastically, and it seemed an unnecessary branch for the sake of the project. Based upon the re-defined terms and remaining 28 articles of the pilot sample, our average reliability rate for all variables came to .68 using Krippendorff's alpha (α) coefficient for ordinal values. Krippendorff's α measures the agreements for nominal, ordinal, interval, and ratio data which calculates disagreements instead of correcting percent-agreements. As explained by Hayes and Krippendorf (2007), "In its two-observer ordinal data version, α is identical to Spearman's rank correlation coefficient ρ (rho) (without ties in ranks)" (p. 5). Because the degrees of presence in this study are ordinal, or variables with attributes that can be ranked by order (Babbie, 2012), Krippendoff's α coefficient offers the best calculable intercoder rate. Using the online "ReCal" or "Reliability Calculator" (Freelon, 2010), our reliability coefficient rates for each variable were as follows:

Table 4: Intercoder reliability results

Theme	Krippendorff's alpha coefficient
Public accountability:	0. 69
Scientific background:	0.56
Economics:	0.80
Consequences:	0.65
Social Progress:	0.69

It is recommended that reliability rate reaches $\alpha \geq .667$, so "Scientific background" and "Consequences" did not achieve optimal reliability. However, when the six trial articles from the pilot sample were included, the rates were as follows: "Public accountability" = .751; "Scientific background" = .73; "Economics" = .82; "Consequences" = .69; and "Social Progress" = .78, indicating that acceptable reliability rates would have likely been reached with a slightly greater sample. In the section that follows, results are presented with consideration of these rates.

Findings

The first research question sought to analyze how the *New York Times* compares to the *Times Picayune* over the past decade in their use of common climate change frameworks, including: public accountability, scientific background, economics, consequences and social progress. Based on the results, the most significant findings were that the *Times Picayune* framed their coverage of sea level rise in economic terms and in terms of social progress much more than the *New York Times*. Additionally, the distribution of articles found under search term "sea level rise" increased dramatically over the past ten years, with evidence of an increase post-Sandy, and the most prominent frame shared by both newspapers was "public accountability."

Table 5: Degrees of presence across themes, New York Times

New York Times					
	Public Accountability	Scientific Background	Economics	Consequences	Social Progress
Mean value of theme's degree of presence (0-6)	3.30	2.41	1.43	3.01	1.38
Doesn't appear at all	**11.70%**	**13.60%**	**31.10%**	**5.80%**	**47.60%**
N	12	14	32	6	49
In the third paragraph or further down	**30.10%**	**39.80%**	**46.60%**	**40.80%**	**30.10%**
N	31	41	48	42	31
In the first or second paragraph	**10.70%**	**32%**	**13.60%**	**18.40%**	**11.70%**
N	11	33	14	19	12
In the headline or lede	**47.60%**	**14.60%**	**8.70%**	**35%**	**10.70%**
N	49	15	9	36	11
Total	100.00%	100.00%	100.00%	100.00%	100.00%
Total N	103	103	103	103	103

Table 6: Degrees of presence across themes, Times Picayune

Times Picayune					
	Public Accountability	Scientific Background	Economics	Consequences	Social Progress
Mean value of theme's degree of presence (0-6)	3.94	2.45	2.64	2.43	2.71
Doesn't appear at all	**6.30%**	**4.70%**	**21.30%**	**3.90%**	**26.80%**
N	8	6	27	5	34
In the third paragraph or further down	**23.60%**	**53.50%**	**29.10%**	**59.10%**	**26.80%**
N	30	68	37	75	34
In the first or second paragraph	**11.80%**	**22.80%**	**21.30%**	**12.60%**	**9.40%**
N	15	29	27	16	12
In the headline or lede	**58.30%**	**18.90%**	**28.30%**	**24.40%**	**37%**
N	74	24	36	31	47
Total	100%	100%	100%	100%	100%
Total N	127	127	127	127	127

Among the articles that included "Economics" in the headline or lede, there was a significant difference ($x^2 = 19.89$, df = 3, $p < .001$) between the *New York Times* (20%) and the *Times Picayune* (80%) (See Table 7). Results were very similar for theme "Social Progress." Of the articles with "Social Progress," in the headline or lede, 81% were *Times Picayune*, whereas 19% were *New York Times* articles, showing a significant difference ($x^2 = 22.9$, df = 3, $p < .001$). Each newspaper appeared even where "Social progress" appeared in the first or second paragraph of the article (Appendix 1).

Hypothesis 1 proposed that the *Times Picayune* framed their articles in terms of public accountability more than the *New York Times*. According to a cross-tabulation of the data, there was no significant difference ($x^2 = 4.05$, df = 3, $p > .05$) between newspapers for the placement of "Public accountability." In general, among placements of "Public accountability," the newspapers compared similarly. For both newspapers, it was more likely that "Public accountability" appeared at the top of the article, as opposed to further down (See Tables 5-6, Appendix 2). Hypothesis 1 was not supported because there is no significant difference between the two newspapers' placement of "Public Accountability." It is worth consideration that this theme was likely to appear in the headline or lede in each paper.

Hypothesis 2 proposed that the *New York Times* framed their articles more heavily in terms of scientific background and causality in comparison to the *Times Picayune.* There was a significant difference ($x^2 = 9.8$, df = 3, $p < .02$) of placement for "Scientific background" between the two newspapers; however, of the articles that show "no presence at all" for scientific background, 70% represent the *New York Times,* whereas 30% represent the *Times Picayune* (See Table 7 and Appendix 3). Of all the *New York Times* articles, only 13.6 % provide no scientific background at all, and nearly 40% show a presence of scientific background in the

third paragraph or further down. Because the reliability rate for this theme was low (.56), hypothesis 2 was not supported. The fact that the *New York Times* was more likely to provide no scientific background than the *Times Picayune,* though, is an observation worth considering.

Table 7: Newspaper comparison: Economics, Social Progress and Scientific Background

	Economics*			**Social Progress****			**Scientific Background *****		
	New York Times	Times Picayune	Total	New York Times	Times Picayune	Total	New York Times	Times Picayune	Total
Doesn't appear at all	52.2%	45.8%	100.0%	59.0%	41.0%	100.0%	**70.0%**	**30.0%**	100.0%
N	32	27		49	34		14	6	
In the third paragraph or further down	56.5%	43.5%	100.0%	47.7%	52.30%	100.0%	37.6%	62.4%	100.0%
N	48	37		31	34		41	68	
In the first or second paragraph	34.1%	65.9%	100.0%	50.0%	50.0%	100.0%	53.2%	46.8%	100.0%
N	14	27		12	12		33	29	
In the headline or lede	**20.0%**	**80.0%**	100.0%	**19.0%**	**81.0%**	100.0%	38.5%	61.5%	100.0%
N	9	36		11	47		15	24	
Total N	103	127		103	127		103	127	

Economics,* p < 0.001; Social Progress, ** p < 0.001; Scientific Background, *** p <.05

The second and third research questions sought to answer whether Hurricanes Katrina and Sandy had an impact on the coverage of sea level rise, with specific attention to whether themes occurred more or less. Using the revised coding instrument for "time period," results showed that over time, the chosen newspaper articles were framed in more economic terms. Of the articles that discussed economics in the first or second paragraph, there was a significant difference ($x^2 = 20.13$, df = 9, $p < .05$) between five years after Katrina (14.6%) and six years

after Katrina (43.9%), which also includes coverage leading up to Hurricane Sandy and during Sandy (See Appendix 4). All other progressions of this frame remain relatively insignificant.

No other themes display a significant change over time, not even with consideration for the dates of each hurricane. Hypothesis 3 proposed that Hurricane Sandy triggered an increase in the framing of consequences for chosen articles. According to cross-tabulation results, there is no significant difference ($x^2 = 12.3$, $df = 9$, $p < .05$) and the degree of salience for "Consequences" did not change between the year before Hurricane Sandy and the year after. Therefore, hypothesis 3 was not supported. The percentage of occurrences for "Consequences" in the lede or headline increased from18% to 32% between "5 years after Katrina" and "6 years after Katrina" (See Table 8). While these values are not significant, it is an observation that might call for future investigation.

Table 8: Degrees of presence for "consequences" over time

Crosstab: Consequences						
		Time				
		1 year before Katrina and 3 years after	5 years after Katrina	6 years after Katrina, 1 year before and during Sandy	The year after Sandy	Total
Doesn't appear at all	Count	**0**	**6**	**1**	**4**	**11**
	% within Consequences	**.0%**	**54.5%**	**9.1%**	**36.4%**	**100.0%**
	% within Time	**.0%**	**10.3%**	**1.4%**	**6.8%**	**4.8%**
	% of Total	**.0%**	**2.6%**	**.4%**	**1.7%**	**4.8%**
In the third paragraph or further down	Count	**23**	**31**	**37**	**26**	**117**
	% within Consequences	**19.7%**	**26.5%**	**31.6%**	**22.2%**	**100.0%**
	% within Time	**52.3%**	**53.4%**	**53.6%**	**44.1%**	**50.9%**
	% of Total	**10.0%**	**13.5%**	**16.1%**	**11.3%**	**50.9%**
In the first or second paragraph	Count	**9**	**9**	**9**	**8**	**35**
	% within Consequences	**25.7%**	**25.7%**	**25.7%**	**22.9%**	**100.0%**
	% within Time	**20.5%**	**15.5%**	**13.0%**	**13.6%**	**15.2%**
	% of Total	**3.9%**	**3.9%**	**3.9%**	**3.5%**	**15.2%**
In the headline or lede	Count	**12**	**12**	**22**	**21**	**67**
	% within Consequences	**17.9%**	**17.9%**	**32.8%**	**31.3%**	**100.0%**
	% within Time	**27.3%**	**20.7%**	**31.9%**	**35.6%**	**29.1%**
	% of Total	**5.2%**	**5.2%**	**9.6%**	**9.1%**	**29.1%**
Total	Count	**44**	**58**	**69**	**59**	**230**
	% within Consequences	**19.1%**	**25.2%**	**30.0%**	**25.7%**	**100.0%**
	% within Time	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	% of Total	**19.1%**	**25.2%**	**30.0%**	**25.7%**	**100.0%**

$x^2 = 12.3$, df = 9, $p < .197$

Discussion

In response to the first research question, it is evident that the *Times Picayune* frames their coverage of sea level rise in terms of economics and social progress more than the *New*

York Times. Additionally, the *New York Times* was less likely than the *Times Picayune* to include a scientific background for every published article on sea level rise in the past ten years.

There are a few reasons that might explain these findings. Because New Orleans has been enduring the long road to recovery since Hurricane Katrina struck in 2005, it is not surprising that there's an emphasis on economics and progression in the articles about sea level rise. The journalists, columnists and op-ed contributors are concerned about the livelihood of their city, and putting a spin on the issue that's either positive or in monetary terms is one way the entire city might relate. Additionally, the Coastal Restoration Project, as well as the public discussion to restore the coast before the state agency was developed, encompasses both money and positive news. The project will cost money, but it will protect people. Rebuilding homes and buildings since Hurricane Katrina also cost money, and seeing the economy get back into swing was a concern for New Orleanians throughout the past decade. For example, in this "point of view" excerpt by a contributing op-ed columnist, the writer proposes to fuse coastal restoration after the 2010 oil spill while building the state's economy:

"**Restoring the coast could also rejuvenate state's economy"**

- Patrick A. Barnes, Feb. 23, 2013

"From oiled marshes and decreased oyster harvests to rising poverty rates and loss of livelihoods, Louisiana has suffered in many ways from the 2010 Deepwater Horizon oil spill. Soon, we will have a chance to repair and restore both our environment and our economy, as the Restore Act sends billions of dollars in Clean Water Act fines to the Gulf Coast states.

"In a number of places across the coast, the debate of how to invest this money has pitted the economy against the environment. But instead of debating false choices, why not aim to pursue both? It's actually a simple proposition: We can create new job and business opportunities by focusing on restoring our coastal and marine ecosystems."

Further down the article, the author mentions how creating jobs to restore the coast will help tackle economic goals in other ways, like attracting more tourists, promoting thriving fisheries, and making communities "more resilient in the face of future storms and sea level rise." The author projects a clear mission to encourage readers that the state's economy and environment are not mutually exclusive. Because this is an opinion piece, not only does it reflect a perpetuated ideology from the publication itself, but it also reflects the words of an individual who is local to the region. Another example that incorporates the "economics" frame in relation to sea level rise can be seen in the lede from one of Mark Schleifstein's articles:

"Rising sea levels, storms are long-term threats; Study predicts potential costs"

- Mark Shleifstein, June 5, 2013

"With the United States coastline, its residents and businesses vulnerable to trillions of dollars of losses from catastrophic storms during the next 75 years, in part fueled by climate change, it's time for the nation to focus on coastal resiliency, according to Lindene Patton, a risk management specialist with Zurich Insurance Group.

"Speaking Tuesday at the three-day Capitol Hill Ocean Week at the Newseum in Washington, D.C., Patton said a recent study pegged the potential cost of disasters during the next 75 years at between $1.1 trillion and $5.4 trillion, in line with a similar $4.7 trillion shortfall in Social Security benefits in the same time frame."

Also framing the lede in terms of "consequences," the start of this article reflects the potential outcomes of climate change through the language of money, whereas the above opinion piece is a reflection of social and economic progress through ecological restoration. This excerpt also shows how the issue is framed in terms of "public accountability," with continuation of the "economics" theme in the first paragraph following the lede.

By contrast, an article with very similar content (with a headline that is almost the same) was published in the *New York Times* about one year before. The article is also about the

"threats" of sea level rise, yet the story is framed differently. Similar to the excerpt from the June 2013 *Times Picayune* article, the theme "consequences" appears right off the bat in the headline and lede. But instead of framing the top of the article in economic terms, "scientific background" represents a high degree of presence by appearing in the lede and first paragraph following the lede.

"Sea Level Rise Seen as Threat To 3.7 Million"

- Justin Gillis, March 14, 2012

"About 3.7 million Americans live within a few feet of high tide and risk being hit by more frequent coastal flooding in coming decades because of the sea level rise caused by global warming, according to new research.

"If the pace of the rise accelerates as much as expected, researchers found, coastal flooding at levels that were once exceedingly rare could become an every-few-years occurrence by the middle of this century."

Yet further down, about half-way through the article, Gillis does refer to the economic consequences of sea level rise, but he introduces the incorporation of economics by quoting a climate change skeptic, before calling attention to the reluctance of insurance companies offering flood insurance, due to the increased risk of flooding from sea level rise:

"Myron Ebell, a climate change skeptic at the Competitive Enterprise Institute, a Washington research group, said that 'as a society, we could waste a fair amount of money on preparing for sea level rise if we put our faith in models that have no forecasting ability.'

"Experts say a few inches of sea level rise can translate to a large incursion by the ocean onto shallow coastlines. Sea level rise has already cost governments and private landowners billions of dollars as they have pumped sand onto eroding beaches and repaired the damage from storm surges."

"Insurance companies got out of the business of writing flood insurance decades ago, so much of the risk from sea level rise is expected to fall on the financially troubled National Flood Insurance Program, set up by Congress, or on state insurance pools. Federal taxpayers also

heavily subsidize coastal development when the government pays to rebuild infrastructure destroyed in storm surges and picks up much of the bill for private losses not covered by insurance."

In comparison to the *Times Picayune* article that is focused on the economic consequences of sea level rise, this article incorporates a higher degree of presence for "scientific background," despite the findings that suggest the *New York Times* is more likely to omit this theme. Yet the reason for this can clearly be noticed by taking a closer look at the articles published by the *New York Times* that omit a "scientific background." Articles where the *New York Times* did not include theme "scientific background," were typically stories that covered international or national political agreements in relation to sea level rise and climate change, presenting a frame much more invested in "public accountability" and politics. For example, some of the headlines in the *New York Times* for these articles include:

"Bush Calls for U.S. to Halt Rise in Gas Emissions by 2025" - Sheryl Gay Stolberg and Andrew Revkin, April 17, 2008

"Delegates at Talks Scramble as Gulf on Issues Remains" – Tom Zeller Jr, December 16, 2009

"Progress on the Sidelines as Rio Conference Ends" – Simon Romero and John M. Broder, June 24, 2012

While these articles address policies related to the projected outcomes of sea level rise, they are more invested in the people and agencies who are involved, placing a stronger political emphasis on the issue. It is possible that the *New York Times* writers assume an expectation that readers are aware of the scientific background for the given policy issue. There are a couple of reasons, too, why the *Times Picayune* was less likely to omit inclusion of the theme "scientific background." First, because it is a regional newspaper, the *Times Picayune* isn't as likely to

cover stories on climate policy on an international level, in comparison to the nationally-circulated newspaper like the *New York Times*. Second, because of the ecological disaster at hand in Southern Louisiana, many of the articles in this study included an explanation for wetland erosion and "relative sea level rise," the combination of regional subsidence and global sea level rise, which is a significant factor for engineering new levee designs. A background of causality for wetland erosion was almost always included in the *Times Picayune* articles, and nearly all of the Louisiana articles in this study were linked to the wetlands.

For example:

"CORPS FINDS THE PRICE TAG ON MORGANZA-TO-THE-GULF LEVEE SYSTEM IS JUSTIFIED"

- Mark Schleifstein, May 29, 2013

"….First, the design elevation for the entire levee system was raised.

"The 2002 report's heights were based on modeling of 17 historic tropical storms and did not consider relativesea-level rise, which is a combination of rising water levels and sinking soils. The new design also factors in expected increases in sea level caused by global warming through 2085, which is 50 years after the levees would be completed."

"Global warming is swamping us"

- Bob Marshall, January 13, 2013

"After assessing all stressors affecting the land bridge they found "the threat of relative sea-level rise (or RSLR, which includes subsidence) was identified as the most critical: If conservative trajectories for RSLR projections were followed, most of the East Land Bridge could be fully submerged by 2060." The projections used in the report show relative sea-level rise at the land bridge to be at least 2.8 feet by the end of the century, and the engineers stressed "The whole region delineated in this project is highly vulnerable to even relatively small permanent variations in the relative MSL (mean sea level)."

Compared to the *New York Times*, the Louisiana newspaper also seemed more likely to incorporate one or more of the identified themes higher up in the article (in the headline or lede).

This could be telling of the newspaper's aim to be more traditional, following a journalistic norm that aims to squeeze all "meaningful aspects" high up at the top. With the exception of "Public accountability," the *New York Times* revealed greater presence of themes in the body of articles, as opposed to the headlines. Several *New York Times* articles also incorporated more anecdotal beginnings to their articles, using descriptive imagery for a lede instead of a factual statement. This didn't occur all the time; however, it could explain why themes were less prominent in the newspaper's headlines or ledes, or why it appeared that way based on the findings of this study.

For example:

The Warming of Greenland

- John Collins Rudolf, January 16, 2007

"Flying over snow-capped peaks and into a thick fog, the helicopter set down on a barren strip of rocks between two glaciers. A dozen bags of supplies, a rifle and a can of cooking gas were tossed out onto the cold ground. Then, with engines whining, the helicopter lifted off, snow and fog swirling in the rotor wash.

"When it had disappeared over the horizon, no sound remained but the howling of the Arctic wind."

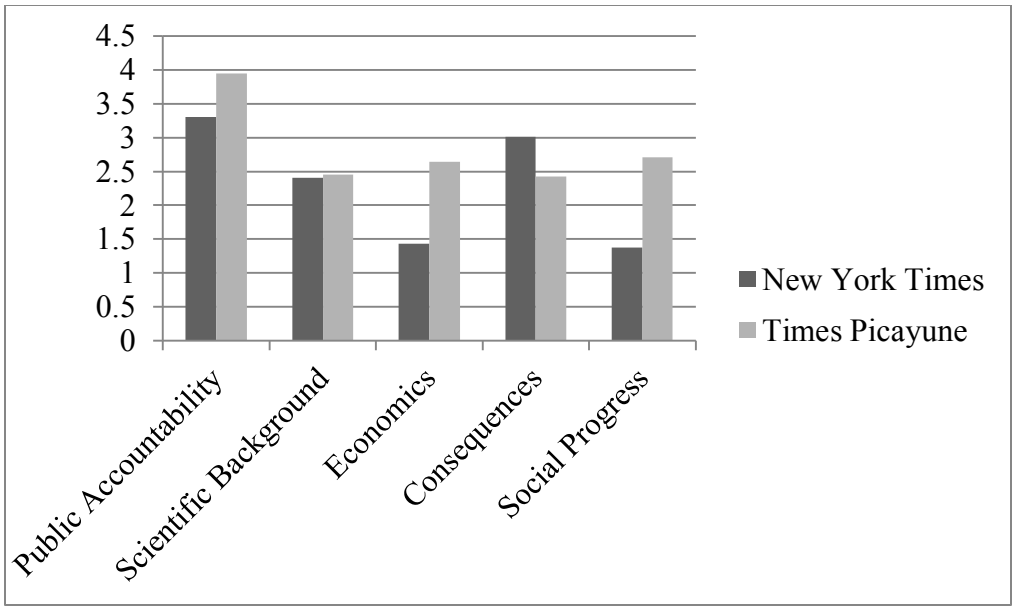

Figure 1: Mean count for salience on scale 0-6, when 6 = in the headline

In response to the second and third research questions, which asked whether Hurricanes Katrina and Sandy encouraged more or less of the identified themes, the results suggest that economic framing increased over time. Reasons for this increase in economic framing of sea level rise coverage might be because of the recession of 2009, the BP Oil Spill of 2010, updated plans for restoring New Orleans infrastructure since Katrina, and the projected costs of damage while Hurricane Sandy was on the rise. Because the significant trend is noticed between five years after Katrina and the year leading up to and during Sandy, it cannot be said that a change in narrative framing occurred the year after Sandy. For example, here are two beginning pieces of articles from the *New York Times* in 2006 and 2013, both considering the impact of sea level rise on beaches:

Next Victim of Warming: The Beaches

- Cornelia Dean , June 20, 2006

NEW SMYRNA BEACH, Fla. – "When scientists consider the possible effects of global warming, there is a lot they don't know. But they can say one thing for sure: sea levels will rise.

This rising water will be felt along the artificially maintained beaches of New Jersey, in the vanishing marshes of Louisiana, even on the ocean bluffs of California. According to a 2000 report by the Heinz Center for Science, Economics and the Environment, at least a quarter of the houses within 500 feet of the United States coast may be lost to rising seas by 2060. There were 350,000 of these houses when the report was written, but today there are far more

"'If it is as bad as people are saying, at some point it will be a crisis,' said Thomas Tomasello of Tallahassee, Fla., a lawyer who represents many owners of coastal property. But he does not dwell on it. 'I cannot deal with sea level rise,' he said. 'That's such a huge issue.'"

Where Sand Is Gold, the Reserves Are Running Dry

- Lizette Alvarez, August 24, 2013

FORT LAUDERDALE, Fla. – "With inviting beaches that run for miles along South Florida's shores, it is easy to put sand into the same category as turbo air-conditioning and a decent mojito -- something ever present and
easily taken for granted.

"As it turns out, though, sand is not forever. Constant erosion from storms and tides and a rising sea level continue to swallow up chunks of beach along Florida's Atlantic coastline. Communities have spent the last few decades replenishing their beaches with dredged-up sand.

"But in South Florida -- Miami-Dade, Broward and Palm Beach Counties -- concerns over erosion and the quest for sand are particularly urgent for one reason: there is almost no sand left offshore to replenish the beaches."

The main difference between these two articles is the incorporation of the theme "scientific uncertainty" in 2006, a theme that was eliminated from this study during the intercoder reliability process. Yet with consideration of the themes which were analyzed in this study, there is an emphasis on people, specifically homeowners, and the consequences that sea level rise will have on property. Both articles address risks that sea level rise will impose on U.S. beaches that are *most* at risk, as opposed to those regional to New York (because it is a national

newspaper). An interesting observation that can be made is the shift from scientific uncertainty over climate change (but with certainty about sea level rise) to the urgent reason that erosion concerns have increased because "there is almost no sand left to replenish the beaches." As will be discussed, one limitation to the research design was the modified code instrument and the limitation of one key term to collect articles. But looking at the difference between these two articles over time, it is interesting to see how "one thing [scientists] can say for sure" is that "sea levels will rise," and about seven years later, "there is no sand left offshore to replenish the beaches." If anything changes in the tone of these articles, it is greater urgency and emphasis on "consequences." While the coding instrument measured degrees of presence based on where themes appear in the article, it does not measure the degree of significance based on strength of connotation. A future research design might consider a way to operationalize words like "urgent."

While a shift in narrative framing was either insignificant or very subtle, the number of articles that were found using the key term "sea level rise" in the *New York Times* increased from about 10 to 27 between 2011 and 2013, the most dramatic increase in articles from that newspaper throughout the ten-year time scale. Comparatively, the New Orleans newspaper experienced a similar spike but a little bit earlier. The number of articles collected from the *Times Picayune* increased from about 7 to 22 between 2006 and 2008, moving on to nearly 30 in 2009. There was a decrease in *Times Picayune* articles between 2009 and 2010, but the number picked up again in 2010. This might be because after the BP Oil Spill in 2010, the discussion for funding wetland restoration began to include one of the lawsuits against BP, so this discussion on restoration picked up.

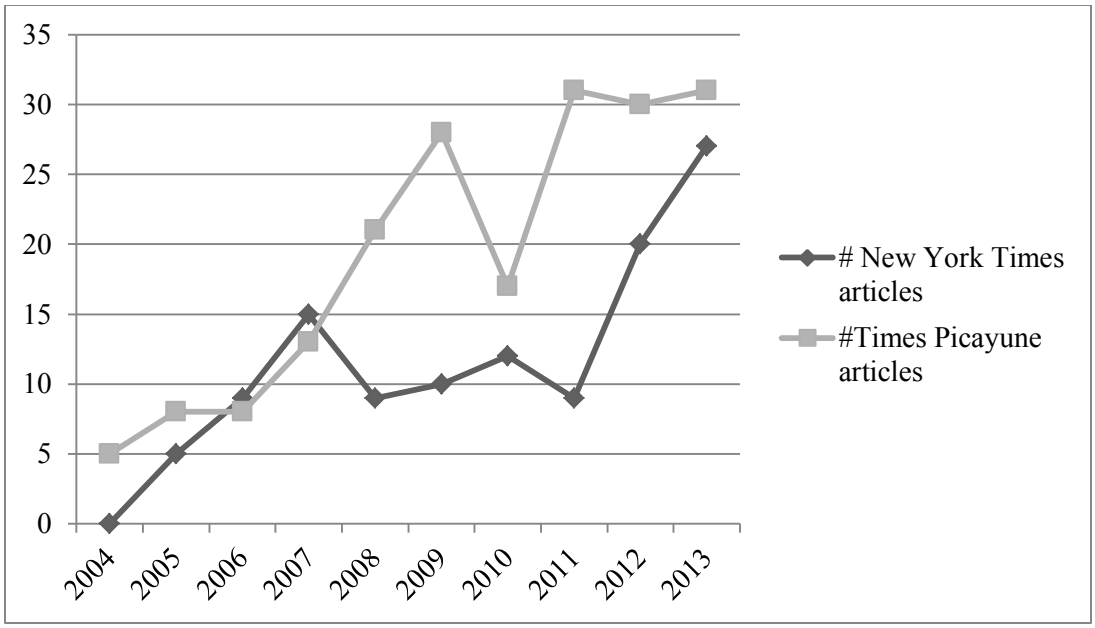

Figure 2: Distribution of articles on sea level rise

There were four problems with the study that restricted useful findings. First, if a better inter-coder reliability rate was achieved for "Scientific background" and "Consequences," then findings would have been more reliable. Second, the code instrument drew upon themes that researchers identified in the past (Nisbet, 2009), (McComas & Shanahan, 1999), (Brossard et al., 2004) but it did not include every variable that previous researchers used. Some themes, like "morality and ethics" or "conflict and strategy," as well as a reliable definition for "scientific uncertainty," could have added nuance to the study. Because this collection of articles was based on the search term "sea level rise," several themes, such as "international relations" didn't seem as relevant compared to a search term like "climate change." Yet with that in mind, the third problem with the study was that it relied on a population of articles that was solely based on one key term. In an effort to reduce articles to one issue related to climate change, with the hope that articles would be more localized to New York City, "sea level rise" was chosen. A random sample of articles using terms "climate change," "sea level rise," and "global warming" might

have allowed for greater discovery in this study on the two coastal cities, by increasing the quantity of units for analysis and broadening the content.

The last limitation was the choice in newspapers. Because a nationally-circulated newspaper was compared to a regional newspaper, there were some differences in framing that reflect this distinction. One reason there was a stronger presence of the theme "economics" in the *Times Picayune* articles might be because of its regional outreach. Information about a state's economy, aside from the potential ideological implications, provides local readers with information that is suggestive of job growth and an updated score on the overall livelihoods of residents in that region. Additionally, the results that showed a higher chance for the *New York Times* to omit "scientific background" was largely because of their coverage on international agreements related to climate policy. In these articles, the emphasis is placed more heavily on political leaders, what they say and what agreements were established, assuming reader knowledge of the scientific details. This finding is interesting, though, because it does address the fact that when the *New York Times* reported on policies related to sea level rise, an explanation for the utility of such policies was sometimes ignored. In other words, if less knowledgeable readers want to understand what such climate policies refer to, they might reject the information at hand if it's presented in black-boxing terms that do not offer a welcoming hand.

By contrast, a prominent example that was seen in the *Times Picayune* as an attempt to "fill the deficit" (Nisbet 2010, p. 51) of climate change ignorance was through columnist Bob Marshall's connection between sport fishing and hunting trends to relative sea level rise. Because Marshall was a columnist (now with *TheLens.com*), he did have more liberty to express his own opinions and find creative ways to report on the issues he covered, which in this case was the

"outdoors" beat. For example, in his article "Fish, wildlife face great threat," from April 2011, he attacks the new GOP House majority for being unsupportive of Louisiana traditions, "not just for the rest of our lives, but for future generations."

In the headline, lede and first paragraph, he began:

"Fish, wildlife face great threat"

- Bob Marshall, April 10, 2011

"There are two things every outdoors person should take away from the budget fight in Washington.

"The first is that the new GOP House majority is the worst news for fish, wildlife and human habitat in our lifetime. Your active participation in the coming debates will be essential to protecting our traditions, not just for the rest of our lives, but for future generations.

"…. The prohibition against enforcing greenhouse gases is especially deadly to southeast Louisiana's coast, which already is experiencing one of the fastest rates of sea-level rise in this hemisphere -- a problem caused by those greenhouse gases.

"Yet, Louisiana's GOP reps -- including our own Steve Scalise -- support those riders".

This article represents Marshall's style that encourages a fusion among traditional Louisianan's who engage in sport fishing and hunting, are likely pro-gun advocates and might be influenced by republican political ideologies to consider how climate policy might impact the Louisiana way, by either threatening or protecting fish and wildlife. Unlike many of the articles in the *New York Times* that address climate policy, Marshall's strategy seems to be an attempt to reach a politically conservative audience and explain precisely what the impact of greenhouse gas emissions are for sport hunting and fishing in Louisiana. This kind of framing could be an example of one of the themes that Nisbet identified, but was not used in the study: "Middle way/alternative path, a third way between conflicting or polarized views or options"(Nisbet,

2009, p. 18). Yet this theme appeared less prominent in the more traditional journalistic articles that reflected objective reporting, where sources were credited for points of view instead of an author's proposal to meet in the middle.

Overall, both newspapers seemed to frame their stories in terms of public accountability, while the *New York Times* showed a slightly greater prominence of the theme "consequences," and the *Times Picayune* incorporated themes "economics" and "social progress" more than the *New York Times.* Additionally, framing sea level rise in economic terms increased between five and six years after Hurricane Katrina, and the number of articles that were found on sea level rise in the *New York Times* increased dramatically the year after Hurricane Sandy. The *New York Times* was more likely to omit "scientific background" in their articles than the *Times Picayune*, but this is because of the way their articles frame stories on climate policy, placing greater emphasis on the political leaders involved. Limitations of the research design included a narrow population, the differences between a regional and national newspaper, and an omission of themes that were noticed throughout the study, like scientific uncertainty, offering a middle way and morality.

Some areas that offer opportunities for further analysis from this study could address industry impacts on economic news frames, how urgency might encourage news that's framed in terms of social progress or consequences, and how urgent connotations in the rhetoric used by journalists in some articles increased over time. In the concluding section that follows, theoretical analysis for these observations is offered, as well as suggestions for future research.

Chapter IV: Conclusion

As addressed in the literature review, memory sensors influence the perceived constructions of nature and environmental challenges, like climate change. These memory sensors are driven by instinct, socially-refined knowledge or narratives and the media's attention to chosen issues. Framing, which involves selective information processing, affects the way individuals perceive an event or thing by making connections to their emotional anticipation or preconceived knowledge. Most individuals will base their framing process on an ideological belief system, such as political affiliation or a culture's expectation of manners, the "rules of order" (Althusser, 2009). The effect that ideology has on framing is through reinforcing an existing ideology, or rejecting it by rejecting the information at hand.

Journalists also experience framing processes when they are writing a story. Through the lens of a journalist, an issue or event will resonate with certain memory sensors in the journalist's mind, the story is shared with readers and readers continue to process the story from their own framing perspective after the story has already been framed. Put simply, a reader's framing process will lead them to the same framing process that a writer experiences, because they will be interested in reading the story. Within the context of climate change, ideology has historically created a political divide around what shouldn't be a scientific "debate." As several studies show, the United States is more likely to include several points of view about climate change in their media coverage, in comparison to other regions like the UK, France and South America. Yet there is more and more evidence that journalistic norms of "objectivity," which perpetuate climate denier biases, are declining.

The content analysis of this study showed that coverage of sea level rise in New Orleans is dominantly framed in economic and socially progressive terms, and that both *The New York Times* and *Times Picayune* frame their stories in terms of public accountability the most. Results also revealed that economic framing increased over time. It is likely that several factors contributed to this trend, including outside events like the 2009 recession, the costs of Hurricane Katrina or the projected costs of Hurricane Sandy. Yet taking a closer look within the region, New Orleans is a city with high poverty rates and one that has historically relied on industry, especially the oil and gas industry.

It is interesting that the *Times Picayune* incorporated social progress as a theme in their headline or lede significantly more than the *New York Times*, but it can be explained by the effort to restore coastal wetlands, calling for many headlines that include the term "coastal restoration." The most interesting finding of this study is greater use of economic framing in the *Times Picayune* and the increase in economic framing over time. As pointed out earlier, readership of the *New York Times* represent a wealthier demographic, which is largely because of the higher concentration of wealth in the city combined with individuals who pay for a subscription several states away. Comparatively, the people of New Orleans latch onto pride for their culture and their economy, and they want to know what costs industry groups or government agencies have bestowed upon them. Moreover, money is the universal language to explain precisely what a particular damage, or environmental externality, amounts to be.

In their study of frame perceptions, researchers Forsyth, Luthra and Bankston (2007) found that Louisiana residents generally see the consequences of oil drilling as positive. Some findings they discuss include positive frames by survey respondents, the economic benefits of oil industry for off-season shrimpers and the exaggeration of media reports (Forsyth, Luthra, &

Bankston, 2007). The researchers noted that several stories followed an attempt to equate Lafayette, Louisiana with other metropolitan areas like New York or Los Angeles: "The media contained vast overstatements describing the city as having enormous wealth and that 1 of every 15 residents was a millionaire in 1979, or that shacks rented for $1,000 a month" (Forsyth et al., 296-297). Given this context of media reports that have glamourized southern Louisiana's industry towns in the past, it only seems natural that regional reporting on any issue – whether it's sea level rise or a new Cajun restaurant in town – would be framed in terms of financial opportunity or cost.

There is something to be said about Louisiana's history and predominant framework for the discussion of climate change impacts. Althusser considers ideology a system of ideas and representations that dominate the mind of an individual or social group. In his essay "Ideology and Ideological State Apparatuses," Althusser (2009) analyzed what he identified as "the reproduction of the conditions of production," which he suggests begins with the education system (p. 123). Though a Marxist perspective, the notion of reproducing ideology through labor relations that begin with the ritualistic practice of rules and learning is a rather compelling idea. One way to conceptualize Althusser's notion of ideology, while considering this study, is by acknowledging the possible causes and effects of media framing on sea level rise in a way that's linked to education.

There are a couple of differences between the *Times Picayune* and *New York Times*. The first obvious point is that the *Times Picayune* reaches a local, regional audience, whereas the *New York Times* is a nationally-circulated newspaper, known on a global scale for its journalistic prestige and coverage of both national and international news. The writers themselves who represent these publications might come from different backgrounds – maybe from different

levels or institutional reputations for schooling, and maybe the writers are simply distinguished by the culture of their readership. Without data from interviews with the writers, this study cannot make any assumptions about the writers or their motives. Yet based upon the first chapter of this study, it is clear that cultural differences exist between New Orleans and New York City. A cultural environment – whether it's the bohemian melting pot of New York or along the levee banks of New Orleans – will influence the framing process of individuals who read there as well as the individuals who write there.

If Goffman's conception of a primary framework holds true, that it "allows its user to locate, perceive, identify, and label a seemingly infinite number of concrete occurrences defined it its terms" (p. 21), then an individual will make sense out of something through emotional anticipation or the knowledge one already obtains. This labeling process arises from cultural and natural influence. Given the historic nature of Louisiana's clear wealth disparity and iconic role that the oil and gas industry has played, industry plays a powerful part in the social structure of Louisiana. The semiotic significance of the oil and gas industry represents both economic power and the potential for destruction of the wetland ecosystems. Yet with consideration of ideas put forth by Hannigan (1995) and Downs (1972), some issues are more tangible and immediate than the impact of wetland erosion. Sea level rise is an even slower-moving threat, in which the effects won't be noticed for another hundred years.

To address his thesis that reproductions of ideology begin with the education system, the wealth disparity in New Orleans contributes to divided labor relations, especially between race and class. The wealthy attend private schools and the poor attend public, while often dropping out of school. In either scenario, money is a language that's clearly understood. The "Ideological State Apparatus" of media further reproduces dominant ways of thinking by aiming to reach an

audience with a certain set of interests, knowledge base and "framing" tendencies. The outcome is the practice of media professionals who frame their work in a way that a targeted audience might engage with, thereby reinforcing the ideological tendencies that are already present. This is not to say that framing sea level rise in economic terms is problematic or directly links an individual's thought process to the oil and gas industry. It is simply an observation for what can be further analyzed about the predominant use of economic framing in the *Times Picayune*.

While there were limitations to the research design, future research might build upon the findings with a larger sample, more clearly defined science variables, the inclusion of surveys and interviews, and an extended focus to the digital media landscape. Consideration of the current media landscape would lend insight to the more current outlets of media, including social media platforms (Twitter, Instagram, or Facebook), video, and infographics. Analysis of the current media landscape would contribute research that's more closely aligned with the behaviors and trends today, but it also opens a Pandora's Box of sources that vary drastically along the credibility scale. Media users often contribute to the population of text of digital media, so creating a methodology that clearly identifies and isolates the tested variables is crucial for this kind of population. Additionally, the urge to push information out quickly can sometimes compromise validity, so that must be addressed in research designs that involve digital media. Yet there are benefits to analyzing the content of new media and social media users, because it may more accurately reflect a population's perception and culture than the news pushed out by ad-dependent publications.

Future research designs might also operationalize changes in rhetorical connotations over time, especially with attention to climate change themes like "urgency." Two significant limitations to this study were: the omission of surveys to analyze regional perceptions of climate

change and how natural disasters might have influenced those perceptions; and the omission of interviews with the journalists who wrote these stories. Access to both of these sets of data would provide a wealth of nuance to this study on framing analysis, all along the transmission line of news. With the interest of time, the study did not administer surveys or include interviews with the journalists who largely contributed to the sample. But such methods might have rounded out the study with insight to readers' impressions of the articles tested, as well as insight to the journalists' intentions for specific articles. Information from both of these processes would offer opportunity for further framing analysis, and more conclusions could be drawn by identifying similarities or differences between each set of data. With the opportunity to receive IRB approval and interview writers from each publication, questions might include:

1. What is the audience you target, and why?
2. Do you think your tone or style in writing about the topic sea level rise has changed over time?
3. How urgent do you believe an acknowledgement for sea level rise in urban planning is for [respective city]?
4. What does it take to get your readers' attention?
5. How do you see your city responding to climate change over the next 50 years?
6. Has the digital media landscape affected your readership, positively or negatively?

With the opportunity to administer surveys, they would be distributed randomly to residents of New York City and New Orleans, as well as a location that was not affected directly by either hurricane, like Kansas City, Missouri. Having all three data sets would allow for

comparison and insight to the impact that a natural disaster might have on the perception of climate change. Surveys would be designed to explore the media effects of newspaper articles, having participants read an article, and respond to a set of questions afterwards. Questions might also ask participants to identify how dangerous they believe sea level rise is for their livelihood and city. For example, with IRB approval, surveys questions might ask:

1. Is this article most heavily focused on: a). governance, b). science, c). economics, d). climate change, or e). social progress?
2. Does the article discuss extreme weather events?
3. Is the article informative?
4. Were you in New Orleans/New York during Hurricane Katrina/Sandy?
5. Do you believe the impacts of sea level rise or climate change will affect your community?

With further analysis from survey results that measure readers' impressions of news articles from the population, and the idea of sea level rise, this study could offer greater nuance to the effects of media. In this case, it could offer greater nuance to the effects of print journalism. Interviewing the writers themselves would also shed light on individual practices, and how that may or may not fit into the larger media institution's agenda. In other words, the process a journalist experiences could be impacted by the desire to keep readership high for the sake of keeping their job, or it could be more heavily influenced by their drive to keep readers informed about the impacts of sea level rise. How the writers frame each piece may largely rely on their primary framing process, as well as target strategy.

The purpose of this study was to comparatively analyze the dominant framing practices for sea level rise between two U.S. coastal cities, New York City and New Orleans. With consideration of each social institution, newspaper analysis and a thorough review of framing effects, this study sheds light on the fact that the *Times Picayune* frames their coverage on the impacts of sea level rise in economic terms and in terms of social progress, and that the *New York Times* is less likely to incorporate themes that were identified as common climate change frameworks at the top of their articles. Considering implications of environmental story-telling and the impact of ideology on framing, it is not surprising that writers for the New Orleans newspaper place emphasis on economics and social progress coming nine years out of Hurricane Katrina. Both newspapers placed an emphasis on public accountability in either the headline or lede of articles, and between five and six years after Hurricane Katrina, the stories framed economically significantly increased.

Content analysis of news framing allows communicators to consider what trends have been practiced and where room for improvement might exist. Without survey analysis for the perception of sea level rise in these regions, it cannot be assumed that media coverage is any reflection of public perception; however, frames reflect and perpetuate a type of cultural environment. While both cities are extremely diverse, subscribers to the *New York Times* average higher household income, are more likely to be affiliated with the Democratic Party, and they might not be local to New York City. Readers of the *Times Picayune*, by contrast, represent a mix of political affiliation and are local to the Greater New Orleans area. Because the *Times Picayune* represents a specific regional part of the United States, the noticeable differences in framing might be reflective of the city's culture and "ruling ideology," determined by a history of industry elites, political power, and cultural ideology.

References:

2006 Annual Report on Local Governments. (2006). Office of the New York State Comptroller. Retrieved from http://www.osc.state.ny.us/localgov/datanstat/annreport/06annreport.pdf

Abramsky, S. (2013, September 18). America's Shameful Poverty Stats. *The Nation*. Retrieved from http://www.thenation.com/article/176242/americas-shameful-poverty-stats

Althusser, L. (2009). "Ideology and Ideological State Apparatuses (Notes towards an investigation). In Sharma, A., & Gupta, A., Eds. *The Anthropology of the State: A Reader*. John Wiley & Sons.

Artz, L., & Murphy, B. O. (2000). *Cultural Hegemony in the United States*. SAGE.

Audience Overview. (2013). *New York Times media Kit*. Retrieved from http://nytmediakit.com/newspaper

Austin, D. E. (2006). Coastal exploitation, land loss, and hurricanes: a recipe for disaster. *American Anthropologist*, *108*(4), 671–691.

Babbie, E. (2012). *The Practice of Social Research*. Cengage Learning.

Bäckstrand, K., & Lövbrand, E. (2006). Planting trees to mitigate climate change: Contested discourses of ecological modernization, green governmentality and civic environmentalism. *Global Environmental Politics*, *6*(1), 50–75.

Banerjee, N. (2014, May 18). Louisiana lawsuits seek oil and gas industry money to restore coastline. *latimes.com*. Retrieved May 19, 2014, from http://www.latimes.com/nation/la-na-louisiana-lawsuits-20140518-story.html

Bell, D. (1976). The coming of the post-industrial society. In *The Educational Forum* (Vol. 40, pp. 574–579). Taylor & Francis. Retrieved from http://www.tandfonline.com/doi/pdf/10.1080/00131727609336501

Bender, T. (2013). *NEW YORK INTELLECT*. Random House LLC.

Boyd, E., & Ghosh, A. (2013). Innovations for enabling urban climate governance: evidence from Mumbai. *Environment and Planning C: Government and Policy*, *31*(5), 926–945. doi:10.1068/c12172

Boykoff, M. T. (2007). Flogging a dead norm? Newspaper coverage of anthropogenic climate change in the United States and United Kingdom from 2003 to 2006. *Area*, *39*(4), 470–481.

Boykoff, M. T., & Yulsman, T. (2013). Political economy, media, and climate change: sinews of modern life: Political economy, media, and climate change. *Wiley Interdisciplinary Reviews: Climate Change*, *4*(5), 359–371. doi:10.1002/wcc.233

Brossard, D., Shanahan, J., & McComas, K. (2004). Are Issue-Cycles Culturally Constructed? A Comparison of French and American Coverage of Global Climate Change. *Mass Communication and Society*, *7*(3), 359–377. doi:10.1207/s15327825mcs0703_6

Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change. *Public Understanding of Science*, *16*(2), 223–243.

Castelló, E. (2010). Framing news on risk industries: Local journalism and conditioning factors. *Journalism*, *11*(4), 463–480. doi:10.1177/1464884910367592

Chanley, V. A. (2002). Trust in Government in the Aftermath of 9/11: Determinants and Consequences. *Political Psychology*, *23*(3), 469–483. doi:10.1111/0162-895X.00294

Chong, D., & Druckman, J. N. (2007). Framing Theory. *Annual Review of Political Science*, *10*(1), 103–126. doi:10.1146/annurev.polisci.10.072805.103054

Cigler, B. A. (2007). The "Big Questions" of Katrina and the 2005 Great Flood of New Orleans. *Public Administration Review*, *67*, 64–76. doi:10.1111/j.1540-6210.2007.00814.x

Cowan, A. L., Goldstein, J., Goodman, J. D., & Silva, D. (n.d.). Mapping Hurricane Sandy's Deadly Toll. Retrieved May 14, 2014, from http://www.nytimes.com/interactive/2012/11/17/nyregion/hurricane-sandy-map.html?_r=0

Cronon, W. (1996). The Trouble with Wilderness: Or, Getting Back to the Wrong Nature. *Environmental History*, *1*(1), 7. doi:10.2307/3985059

Nisbet, M. (2010). "Knowledge into Action." In D'Angelo, P., & Kuypers, J. A., Eds. *Doing News Framing Analysis: Empirical and Theoretical Perspectives*. Routledge.

Daniels, R. J., Kettl, D. F., & Kunreuther, H. (2011). *On Risk and Disaster: Lessons from Hurricane Katrina*. University of Pennsylvania Press.

Dean, M. (2009). *Governmentality: Power and Rule in Modern Society*. SAGE Publications.

Downs, A. (1972). The issue-attention cycle and the political economy of improving our environment. *The Political Economy of Environmental Control (University of California, Berkely)*, 9–34.

Entman, R. M. (1993). Framing: Toward Clarification of a Fractured Paradigm. *Journal of Communication*, *43*(4), 51–58. doi:10.1111/j.1460-2466.1993.tb01304.x

Fagan, B. (2013, May 31). The Impending Deluge. *The New York Times*. Retrieved from http://www.nytimes.com/2013/06/01/opinion/global/brian-fagan-the-impending-deluge.html

Forsyth, C. J., Luthra, A. D., & Bankston, W. B. (2007). Framing perceptions of oil development and social disruption. *The Social Science Journal*, *44*(2), 287–299. doi:10.1016/j.soscij.2007.03.015

Freelon, D. G. (2010). ReCal: Intercoder reliability calculation as a web service. *International Journal of Internet Science*, *5*(1), 20–33.

Frierson, R. (2014, May 16). Unlearning Katrina's lesson: Bills would again make levee board a governor's plaything. *The Lens*. Retrieved May 19, 2014, from http://thelensnola.org/2014/05/16/unlearning-katrinas-lesson-bills-would-again-make-levee-boards-a-governors-plaything/

Gamson, W. A. (1999). Beyond the Science-versus-Advocacy Distinction. *Contemporary Sociology*, *28*(1), 23–26. doi:10.2307/2653844

Goffman, E. (1974). *Frame analysis: an essay on the organization of experience*. Cambridge, Mass: Harvard University Press.

Greenberg, M. R., Sandman, P. M., Sachsman, D. B., & Salomone, K. L. (1989). Network Television News Coverage of Environmental Risks. *Environment: Science and Policy for Sustainable Development*, *31*(2), 16–44. doi:10.1080/00139157.1989.9928931

Hartig, E. K., Gornitz, V., Kolker, A., Mushacke, F., & Fallon, D. (2002). Anthropogenic and climate-change impacts on salt marshes of Jamaica Bay, New York City. *Wetlands*, *22*(1), 71–89.

Hayes, A., F., & Krippendorff, K. (2007). Answering the Call for a Standard Reliability Measure Coding Data. *Communication Methods and Measures*, *1*(1), 77–89.

Hilgartner, S., & Bosk, C. L. (1988). The Rise and Fall of Social Problems: A Public Arenas Model. *American Journal of Sociology*, *94*(1), 53–78.

Hurricane Sandy Recovery. (n.d.). *National Park Service*. Retrieved from http://www.nps.gov/stli/after-hurricane-sandy.htm

Hurricane Sandy: One Year Later. (n.d.). Retrieved May 12, 2014, from http://www.fema.gov/hurricane-sandy-one-year-later

Iyengar, S. (1996). Framing responsibility for political issues. *The Annals of the American Academy of Political and Social Science*, 59–70.

Iyengar, S., & Simon, A. (1993). News Coverage of the Gulf Crisis and Public Opinion: A Study of Agenda-Setting, Priming, and Framing. *Communication Research*, *20*(3), 365–383. doi:10.1177/009365093020003002

Jr, R. P. (2012, November 1). Roger Pielke: Hurricanes and Human Choice. *Wall Street Journal*. Retrieved from http://online.wsj.com/news/articles/SB10001424052970204840504578089413659452702

Kahneman, D. (2003). Maps of Bounded Rationality: Psychology for Behavioral Economics. *American Economic Review*, *93*(5), 1449–1475.

Lippmann, W. (1946). *Public Opinion*. Transaction Publishers.

Louisiana Coastal Wetlands. (n.d.). *USGS*. Retrieved from http://pubs.usgs.gov/fs/la-wetlands/

Marshall, B. (2012, November 8). After Sandy, there's no denying global warming: Bob Marshall. *NOLA.com*. Retrieved May 12, 2014, from http://www.nola.com/opinions/index.ssf/2012/11/after_sandy_theres_no_denying.html

Marshall, B. (2014, April 2). Coastal restoration financing is uncertain, but Louisiana has ideas to find $50 billion. *The Lens*. Retrieved May 13, 2014, from http://thelensnola.org/2014/04/02/coastal-restoration-financing-is-uncertain-but-state-has-ideas-for-more-money/

Martin, P. H., & Yeates, J. L. (1991). Louisiana and Texas Oil & (and) Gas Law: An Overview of the Differences. *La. L. Rev.*, *52*, 769.

McChesney, R. W. (1999). *Rich media, poor democracy: communication politics in dubious times*. Urbana: University of Illinois Press.

McComas, K., & Shanahan, J. (1999). Telling Stories About Global Climate Change Measuring the Impact of Narratives on Issue Cycles. *Communication Research*, *26*(1), 30–57. doi:10.1177/009365099026001003

McCombs, M. E., & Shaw, D. L. (1972). The Agenda-Setting Function of Mass Media. *Public Opinion Quarterly*, *36*(2), 176–187. doi:10.1086/267990

N. P. R. (2010, August 22). After Katrina, New Orleans Has A New Political Face. *NPR.org*. Retrieved May 14, 2014, from http://www.npr.org/templates/story/story.php?storyId=129361869

New York City - Facts & Summary. (n.d.). *HISTORY.com*. Retrieved May 10, 2014, from http://www.history.com/topics/new-york-city

NewOrleans and Baton Rouge Target Audience |. (n.d.). | *NOLA Media Group*. Retrieved from http://www.nolamediagroup.com/audience/

Nisbet, M. C. (2009). Communicating Climate Change: Why Frames Matter for Public Engagement. *Environment: Science and Policy for Sustainable Development*, *51*(2), 12–23. doi:10.3200/ENVT.51.2.12-23

Pan, Z., & Kosicki, G. M. (1993). Framing analysis: An approach to news discourse. *Political Communication*, *10*(1), 55–75.

Posner, E. A., & Vermeule, A. (2009). Crisis Governance in the Administrative State: 9/11 and the Financial Meltdown of 2008. *The University of Chicago Law Review*, *76*(4), 1613–1682.

Rosenzweig, C., Solecki, W. D., Blake, R., Bowman, M., Faris, C., Gornitz, V., … Zimmerman, R. (2011). Developing coastal adaptation to climate change in the New York City infrastructure-shed: process, approach, tools, and strategies. *Climatic Change*, *106*(1), 93–127. doi:10.1007/s10584-010-0002-8

Shuler, Marsha. (2014). Voters skew away from mainstream parties. Retrieved May 12, 2014, from http://theadvocate.com/home/8065282-125/louisiana-voters-skew-away-from

The Lens. (2013, July 26). Chat with Bob Marshall about coastal loss lawsuit. *ScribbleLive Embed*. Retrieved May 19, 2014, from http://www.scribblelive.com/Event/Chat_with_Bob_Marshall_about_coastal_loss_lawsuit

Tidwell, M. (2007). *Bayou Farewell: The Rich Life and Tragic Death of Louisiana's Cajun Coast*. Random House LLC.

Top 100 Newspapers. (2013). *The Paperboy*. Retrieved from http://www.thepaperboy.com/usa-top-100-newspapers.cfm

U.S. Census Bureau. (2012). Retrieved from http://quickfacts.census.gov/qfd/states/36/3651000.html

Ungar, S. (1992). The Rise and (relative) Decline of Global Warming as a Social Problem. *Sociological Quarterly*, *33*(4), 483–501. doi:10.1111/j.1533-8525.1992.tb00139.x

York, 79 Fifth Avenue New, & 10003620-4230, N. (n.d.). New Orleans Poverty Rate Almost Twice National Average, Report Finds. *Philanthropy News Digest (PND)*. Retrieved May

12, 2014, from http://www.philanthropynewsdigest.org/news/new-orleans-poverty-rate-almost-twice-national-average-report-finds

Zamith, R., Pinto, J., & Villar, M. E. (2012). Constructing Climate Change in the Americas: An Analysis of News Coverage in U.S. and South American Newspapers. *Science Communication*, *35*(3), 334–357. doi:10.1177/1075547012457470

Appendix 1: Crosstab for Newspaper and Social Progress

Newspaper * Social Progress Cross-tabulation				
		Newspaper		
		The New York Times	The Times Picayune	Total
Doesn't appear at all	Count	**49**	**34**	**83**
	% within Social Progress	**59.0%**	**41.0%**	**100.0%**
	% within Newspaper	**47.6%**	**26.8%**	**36.1%**
	% of Total	**21.3%**	**14.8%**	**36.1%**
In the third paragraph or further	Count	**31**	**34**	**65**
	% within Social Progress	**47.7%**	**52.3%**	**100.0%**
	% within Newspaper	**30.1%**	**26.8%**	**28.3%**
	% of Total	**13.5%**	**14.8%**	**28.3%**
In the first or second paragraph	Count	**12**	**12**	**24**
	% within Social Progress	**50.0%**	**50.0%**	**100.0%**
	% within Newspaper	**11.7%**	**9.4%**	**10.4%**
	% of Total	**5.2%**	**5.2%**	**10.4%**
In the headline or lede	Count	**11**	**47**	**58**
	% within Social Progress	**19.0%**	**81.0%**	**100.0%**
	% within Newspaper	**10.7%**	**37.0%**	**25.2%**
	% of Total	**4.8%**	**20.4%**	**25.2%**
Total	Count	**103**	**127**	**230**
	% within Social Progress	**44.8%**	**55.2%**	**100.0%**
	% within Newspaper	**100.0%**	**100.0%**	**100.0%**
	% of Total	**44.8%**	**55.2%**	**100.0%**

Appendix 2: Crosstab for Newspaper and Public Accountability

Newspaper * Public Accountability Cross-tabulation				
		Newspaper		
		The New York Times	The Times Picayune	Total
Doesn't appear at all	Count	**12**	**8**	**20**
	% within Public Accountability	**60.0%**	**40.0%**	**100.0%**
	% within Newspaper	**11.7%**	**6.3%**	**8.7%**
	% of Total	**5.2%**	**3.5%**	**8.7%**
In the third paragraph or further down	Count	**31**	**30**	**61**
	% within Public Accountability	**50.8%**	**49.2%**	**100.0%**
	% within Newspaper	**30.1%**	**23.6%**	**26.5%**
	% of Total	**13.5%**	**13.0%**	**26.5%**
In the first or second paragraph	Count	**11**	**15**	**26**
	% within Public Accountability	**42.3%**	**57.7%**	**100.0%**
	% within Newspaper	**10.7%**	**11.8%**	**11.3%**
	% of Total	**4.8%**	**6.5%**	**11.3%**
In headline or lede	Count	**49**	**74**	**123**
	% within Public Accountability	**39.8%**	**60.2%**	**100.0%**
	% within Newspaper	**47.6%**	**58.3%**	**53.5%**
	% of Total	**21.3%**	**32.2%**	**53.5%**
Total	Count	**103**	**127**	**230**
	% within Public Accountability	**44.8%**	**55.2%**	**100.0%**
	% within Newspaper	**100.0%**	**100.0%**	**100.0%**
	% of Total	**44.8%**	**55.2%**	**100.0%**

Appendix 3: Crosstab for Newspaper and Scientific Background

Crosstab: Scientific Background				
		Newspaper		
		The New York Times	The Times Picayune	Total
Doesn't appear at all	Count	**14**	**6**	**20**
	% within Scientific Background	**70.0%**	**30.0%**	**100.0%**
	% within Newspaper	**13.6%**	**4.7%**	**8.7%**
	% of Total	**6.1%**	**2.6%**	**8.7%**
In the third paragraph or further down	Count	**41**	**68**	**109**
	% within Scientific Background	**37.6%**	**62.4%**	**100.0%**
	% within Newspaper	**39.8%**	**53.5%**	**47.4%**
	% of Total	**17.8%**	**29.6%**	**47.4%**
In the first or second paragraph	Count	**33**	**29**	**62**
	% within Scientific Background	**53.2%**	**46.8%**	**100.0%**
	% within Newspaper	**32.0%**	**22.8%**	**27.0%**
	% of Total	**14.3%**	**12.6%**	**27.0%**
In the headline or lede	Count	**15**	**24**	**39**
	% within Scientific Background	**38.5%**	**61.5%**	**100.0%**
	% within Newspaper	**14.6%**	**18.9%**	**17.0%**
	% of Total	**6.5%**	**10.4%**	**17.0%**
Total	Count	**103**	**127**	**230**
	% within Scientific Background	**44.8%**	**55.2%**	**100.0%**
	% within Newspaper	**100.0%**	**100.0%**	**100.0%**
	% of Total	**44.8%**	**55.2%**	**100.0%**

Appendix 4: Crosstab for Economics and Time

Crosstab: Economics						
		Time				
		1 year before Katrina and 3 years after	5 years after Katrina	6 years after Katrina, 1 year before and during Sandy	The year after Sandy	Total
Doesn't appear at all	Count	**19**	**19**	**10**	**11**	**59**
	% within Economics	**32.2%**	**32.2%**	**16.9%**	**18.6%**	**100.0%**
	% within Time	**43.2%**	**32.8%**	**14.5%**	**18.6%**	**25.7%**
	% of Total	**8.3%**	**8.3%**	**4.3%**	**4.8%**	**25.7%**
In the third paragraph or further down	Count	**13**	**20**	**27**	**25**	**85**
	% within Economics	**15.3%**	**23.5%**	**31.8%**	**29.4%**	**100.0%**
	% within Time	**29.5%**	**34.5%**	**39.1%**	**42.4%**	**37.0%**
	% of Total	**5.7%**	**8.7%**	**11.7%**	**10.9%**	**37.0%**
In the first or second paragraph	Count	**8**	**6**	**18**	**9**	**41**
	% within Economics	**19.5%**	**14.6%**	**43.9%**	**22.0%**	**100.0%**
	% within Time	**18.2%**	**10.3%**	**26.1%**	**15.3%**	**17.8%**
	% of Total	**3.5%**	**2.6%**	**7.8%**	**3.9%**	**17.8%**
In the headline or lede	Count	**4**	**13**	**14**	**14**	**45**
	% within Economics	**8.9%**	**28.9%**	**31.1%**	**31.1%**	**100.0%**
	% within Time	**9.1%**	**22.4%**	**20.3%**	**23.7%**	**19.6%**
	% of Total	**1.7%**	**5.7%**	**6.1%**	**6.1%**	**19.6%**
Total	Count	**44**	**58**	**69**	**59**	**230**
	% within Economics	**19.1%**	**25.2%**	**30.0%**	**25.7%**	**100.0%**
	% within Time	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	% of Total	**19.1%**	**25.2%**	**30.0%**	**25.7%**	**100.0%**