LOCAL AND STATE CLIMATE INITIATIVES IN LOUISIANA SINCE 2005: CONTENT AND THEMATIC ANALYSES

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LOCAL AND STATE CLIMATE INITIATIVES IN LOUISIANA
SINCE 2005: CONTENT AND THEMATIC ANALYSES

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
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in

The Department of Geography and Anthropology

by
Jessie Fay Parrott
B.A. Bard College at Simon’s Rock, 2020
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Abstract

Louisiana is uniquely exposed to severe weather because of its geography and climate. Louisiana’s extreme weather is exacerbated by anthropogenic climate change, which will worsen in the future. The risks its population and environment are exposed to has generated several policies and planning documents, nine of which are analyzed in this thesis. Three plans are from the state level, three are from the parish level, and three are from the urban (New Orleans) level. These planning documents pose various adaptation and mitigation actions to ameliorate and address multiple climate issues. These actions utilize specific mitigation strategies. The content and thematic analyses investigate how the plans succeed and fail to address climate hazards through these actions. The qualitative analyses ask how the plans address climate hazards through mitigation and adaptation actions. The thematic analysis found seven themes from the nine plans represented by data taken directly from the planning documents. The content analysis used specific mitigation and adaptation phrases in a word and phrase count to investigate the volume of topics.

Infrastructure was the primary result of adaptation and mitigation actions from both analyses across state and local levels. Equity was the least discussed theme across the nine plans. Louisiana is a high-emitting state where industry produces more than half of its emissions. This was not addressed in any actions. Anthropogenic climate change was recognized but not addressed in the adaptation and mitigation actions. These results suggest that extractive industry (material, chemical, and non-renewable energies) prioritizes economic and social policies over climate issues and the coastal population.
Chapter 1. Introduction

Since the devastating impacts of the 2005 hurricane season, Louisiana and its parishes have launched a series of initiatives to address the threat climate change poses to Louisiana, the future of Louisiana depends on integrated and comprehensive climate change mitigation and adaptation strategies due to the severity of anthropogenic climate change. Mitigation actions address current and future problems to prevent them from worsening\(^1\). In contrast, adaptation actions acknowledge changing conditions and adapt ways of life to survive and thrive in climate crisis conditions\(^2\). Adaptive measures aim to bolster community resilience to ensure that humans and other species survive and thrive under present and predicted future climate change conditions and their associated social and ecological effects\(^3\). Together, adaptation and mitigation actions reduce the risk of climate hazards in the present and future with experience and future predictions\(^4\).

This thesis investigates if Louisiana's climate initiatives since 2005 have proposed comprehensive adaptation and mitigation topics and strategies. The data


Wilbanks TJ. 2008. Enhancing the Resilience of Communities to Natural and Other Hazards: What We Know and What We Can Do. Natural Hazards Observer. 32:10-11.

analyzed in this thesis are climate planning documents, discussed as initiatives and plans. These plans detail the initiatives’ proposed actions and policies. Comprehensive adaptation and mitigation actions address climate hazards and reduce risk. Comprehensive actions address aspects in the scale of mitigation and adaptation, including implementation accountability and timeline.

By examining the efficacy of adaptation and mitigation actions proposed in these initiatives and identifying themes and deficiencies, a better understanding can be gained of how various changemakers in Louisiana can contribute positively to the future of the climate crisis in Louisiana. Louisiana is exposed to a high risk from various climate hazards. Considering current and future climate crisis conditions, Louisiana needs various rigorous adaptation and mitigation plans to have resilient communities in the climate crisis. This thesis will address the following questions:

- How have state and local climate initiatives addressed climate hazards in Louisiana since 2005 through adaptation and mitigation actions?
  - What climate change adaptation and mitigation strategies are used in Louisiana initiatives, and where?
  - What climate hazards are addressed and unaddressed by initiatives' adaptation and mitigation actions?

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7Carruthers TJB, Hemmerling SA, Barra M, Saxby TA, Moss L. 2017. This is your shield...this is your estuary: Building Community and Coastal Resilience to a Changing Louisiana Coastline through Restoration of Key Ecosystem Functions. The Water Institute of the Gulf.
To answer these questions and increase understanding of climate change adaptation and mitigation in Louisiana climate initiatives, this study applies a conceptual content analysis framework\textsuperscript{8} to analyze mitigation and adaptation topics. This study employs a multi-scalar analysis by analyzing plans at multiple geographical scales. The initial analytical method, content analysis, is combined with thematic analysis to create a robust study\textsuperscript{9}. The thematic analysis is inductive and allows themes to emerge during the coding process determined by the data\textsuperscript{10}. From the analyses, infrastructural mitigation and adaptation actions were prevalent in all the initiatives. The majority of the initiatives exclude equity-related issues. Most initiatives exclude mitigative and adaptive measures focusing on energy. Initiatives that discuss energy reveal a bias toward extractive industry. Extractive industry in Louisiana is industry that prioritizes and invests in resource-extractive industry. The bias toward extractive industry is a prioritization of extractive processes for economic, political, and social reasons. These contexts differ in the planning documents and their individual biases. Some of the initiatives that show bias for industry also show bias toward economic development, especially on the coast, over at-risk populations. This investigation completes content


and theme-based climate mitigation and adaptation analyses of climate initiatives\(^\text{11}\). In such a high-risk state as Louisiana, this study analyzing the prevalence of themes in planning and implementation initiatives is relevant.

Louisiana’s geographic positionality climatically and within the context of the Gulf Coast provides a rationale for this study. Climatically and geographically, Louisiana is unique amongst the Gulf Coast and southern states because it has more climate legislation than any other Gulf Coast state\(^\text{12}\). By this measure, Louisiana can be labeled the most progressive Gulf Coast state in climate policy. However, more analyses are needed to understand Louisiana’s climate policy holistically as well as the specific adaptation and mitigation actions in the planning documents.

Analysis of Louisiana climate policy at the state and local levels is missing from the literature. The qualitative analyses utilize multiple geographical scales; parish, urban, and state. This analysis contributes to climate policy analysis and research in Louisiana\(^\text{13}\) with a multi-faceted, mixed-method analysis of state and local climate initiatives to understand existing climate policy in Louisiana better. The results also contribute to the industry and infrastructure-related climate crisis research issues in the

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South and the Gulf Coast\textsuperscript{14}, especially from a state with high energy output and industrial activity\textsuperscript{15}. These primary issues, water management, flood prevention infrastructure, industrial energy use, rural infrastructure, and urban and rural transportation, are significant issues in these initiatives. By better understanding climate mitigation and adaptation strategies in Louisiana climate initiatives, policymakers at all government levels can:

1) Make specific, targeted recommendations for future policy,

2) Prioritize safety in dealing with climate hazards for Louisianans,

3) Contribute positively to the climate crisis on behalf of Louisiana.

Analyzing climate policy initiatives in Louisiana is relevant to departmental government stakeholders, members of the legislature\textsuperscript{16}, and community members throughout the state\textsuperscript{17}. These initiatives directly impact the future of Louisiana, as stated

Savonis M, Burkett VR, Potter JR. 2008. Impacts of climate change and variability on transportation systems and infrastructure: Gulf coast study, Phase I.


in their planning documents\textsuperscript{18}. This analysis gives context to the initiatives' efficacy in Louisiana’s future capacity to adapt and mitigate the climate crisis. These plans hold a stake in the current and future well-being of Louisianans and the state.

Chapter 2. Background

This section discusses the critical geographical context in Louisiana needed to understand the nine initiatives discussed in this thesis. Specific climate hazards posing risks to Louisiana are summarized in this chapter. These climate hazards pose short- and long-term risks, such as hurricanes (short term) and subsidence (long term). These climate hazards are intrinsically related to the adaptation and mitigation actions detailed in the initiatives and why government bodies prioritize these actions. The geography of each initiative is detailed, giving context to the initiatives’ historical experience with climate hazards, proximity and risk to hazards, and rationale for planning. Political and spatial geographies and how climate hazards intersect at the parish, urban, and state scales are explored. The multiscalar analysis is explored and detailed in this section in the context of relevant literature and how this study contributes to appropriate fields.
2.1. Louisiana’s changing coast and climate

Louisiana faces many climate hazards due to anthropogenic-induced climate change\textsuperscript{19}. This section discusses the climate hazards most predominantly discussed in the initiatives analyzed in this thesis, the basic science of these hazards, and how they pose a risk. This thesis examines sea-level rise, hurricanes, land loss, saltwater intrusion, coastal and inland flooding, increased precipitation, tornadoes, subsidence, and extreme heat. These hazards’ characteristics are changing due to anthropogenic climate change.

Louisiana’s exposure to this unique combination of dangerous climate hazards requires holistic adaptation and mitigation actions. The analysis of adaptation and mitigation actions in this thesis seeks to understand the potential effectiveness of these initiatives. This is crucial because of the severity and changing nature of these hazards in the context of the climate crisis.

One subsection of hazards is natech hazards (the word natech coming from nature and technology). Natech hazards are created by the intersection of risk by

weather and industry. The risk of natech disasters is high in Louisiana because of various sectors across the state\textsuperscript{20}, notably energy production\textsuperscript{21}. Hurricanes frequently cause dangerously high numbers of oil and chemical spills. Ten days after Hurricane Ida (8/29/2021), over 2000 oil and chemical spills were reported in southeast Louisiana\textsuperscript{22}.

Subsidence is caused by the settling of land over time\textsuperscript{23}. Extractive technologies, such as oil drilling and the tapping of aquifers, also causes subsidence\textsuperscript{24}. In Louisiana, large amounts of sediment in the Mississippi River, protected by earthen levees, get pushed into the Gulf of Mexico\textsuperscript{25}. This allows subsidence to proceed without rejuvenation, causing land loss\textsuperscript{26}. In Louisiana, subsidence compounds risks associated with sea-level rise\textsuperscript{27}. Saltwater intrusion also compounds risks associated with subsidence, exemplified in canal construction leading to loss of sediment and increased

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\textsuperscript{27}Waggonner and Ball Architects. 2013. Greater New Orleans Urban Water Plan Implementation. Waggonner and Ball.

\textsuperscript{27}Ramsey KE, Penland S. 1989. Sea-level rise and subsidence in Louisiana and the Gulf of Mexico.
subsidence. Subsidence is particularly noticeable in New Orleans, built upon the Mississippi River Delta. Multiple initiatives analyzed in this thesis address subsidence.

Sea level rise and saltwater intrusion are two related climate hazards. Saltwater intrusion into coastal bayous causes detriment to coastal ecosystems because of sea-level rise. Saltwater intrusion also contributes to higher rates of flooding and coastal erosion. Sea-level rise and saltwater intrusion projections appear in various reports for Louisiana. These projections make adapting topics for these hazards a focus of many climate initiatives at the local and state levels. Mitigating risk from both climate hazards is also a focus of many climate initiatives at the state and local levels because of the compounded risk from sea-level rise, saltwater intrusion, and the other climate hazards linked.

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Sea level rise and saltwater intrusion often cause land loss. Multiple climate hazards are drivers of land loss: major hurricanes, sea-level rise, saltwater intrusion, and subsidence. Every 100 minutes, a football field of land (57,600 square feet) is lost to the Gulf of Mexico. At the time of a 2016 USGS report, Louisiana had lost an estimated 2,006 square miles since 1932. The oil and gas industry, a considerable contributor to greenhouse gas emissions in Louisiana, has a monumental impact on coastal ecosystems and wetlands, including the loss of wetland habitat.

Coastal Louisiana, specifically southeastern coastal Louisiana, sees a high return period for hurricanes. Predictions are that tropical cyclones will become more extreme, according to the IPCC’s most recent report, and sea-level rise will continue to increase. Tropical cyclones are low-pressure systems that form over warm water.

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They can last for long periods if ideal conditions persist. Tropical cyclones disperse either over cool water or over land. Tropical cyclones with maintained surface wind speeds of less than 39 miles per hour are tropical depressions. Tropical cyclones with sustained surface wind speeds between 39 and 73 miles per hour are tropical storms. Tropical cyclones with maintained surface wind speeds of 74 miles per hour or more are hurricanes. The Saffir-Simpson Hurricane Wind Scale is the 1-5 category rating used to rate the intensity of hurricanes. The years 2005 and 2020 were landmark hurricane seasons, with 27 named storms in 2005 and 30 named storms in 2020. In addition to wind damage, storm surge is a dangerous aspect of hurricanes. Storm surge is a particular type of flooding that happens when strong winds push lots of water to shore during a storm.

The seasonality of hurricanes is under reassessment. Some experts argue that the Atlantic hurricane season should start in May instead of June. Many climatologists hesitate to say whether hurricanes happen more often in Louisiana because of

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anthropogenic climate change or not. However, many studies show that hurricanes are harder to predict, and when they occur, they are often very intense\textsuperscript{49}. Rapid intensification of hurricanes is happening more frequently in the 21st century and is difficult to predict and dangerous\textsuperscript{50}.

Flooding is the subject of many specialized policies and insurance Louisiana\textsuperscript{51}. All of Louisiana is at risk to flooding\textsuperscript{52}. Precipitation from storms is a formidable climate hazard in Louisiana, which often causes flooding. A recent landmark series of events was the 2016 floods\textsuperscript{53}, which generated climate initiatives at the local and state level\textsuperscript{54},

and occurred in May – outside of hurricane season, the wetter six months of the year\textsuperscript{55}. Louisiana, especially its coastal parishes, is at high risk for flooding\textsuperscript{56}.

Extreme heat is another dangerous climate hazard exacerbated by anthropogenic climate change in Louisiana\textsuperscript{57}. Urban areas are seeing more localized heat stress due to anthropogenic climate change in the form of urban heat islands\textsuperscript{58}. A pressing public health risk, many urban areas across the country have assessed ways to mitigate extreme heat-related health issues and deaths as they have risen in the 21st-century\textsuperscript{59}. Heat stress is incredibly deadly in Louisiana, mainly when power outages occur\textsuperscript{60}. Many cases of deaths in hurricanes are not from tornadoes or


drowning but from heat stress\textsuperscript{61}. After Hurricane Ida in 2021, at least ten individuals died in New Orleans from extreme heat\textsuperscript{62}.

The Coastal Protection and Restoration Authority (CPRA) reported in its 2017 plan that if land loss continues at the current rate, the United States will face roughly $40 billion in managing retreat for Louisiana’s coastal population\textsuperscript{63}. The impact of climate hazards in Louisiana is incredibly costly\textsuperscript{64}. The cost at the local level cannot be measured between social stress, trauma, mental health, and loss of life. Climate crisis conditions in Louisiana are generally getting harder to predict and more severe\textsuperscript{65}. The analyses of mitigative and adaptive actions in this thesis aim to assess the initiatives’ success in addressing climate hazards.

2.2. Adaptation & mitigation

Adapting and mitigating actions ameliorate risk from climate, technological, and natech hazards\textsuperscript{66}. Natech hazards are the combination of natural–technological hazards. In Louisiana, hazards pose a risk to individuals and communities on many scales. Adaptive and mitigative actions address these hazards and tangibly aid communities striving for resilience\textsuperscript{67}. Adaptation accepts the circumstances of the climate crisis and changes the characteristics of human life to function at the level of the climate crisis\textsuperscript{68}. Mitigation involves anticipating risk from the climate crisis and changing aspects of human life according to the risk\textsuperscript{69}. The nine initiatives discussed in this thesis plan for the future in various ways, including many forms of adaptive and mitigative action.

Comprehensive mitigative actions effectively lower future risk of hazards\textsuperscript{70}. Louisiana’s geography and climate pose an elevated risk that requires mitigation measures across industry sectors and government. Mitigation actions are ideally implemented proactively to address future risk adequately\textsuperscript{71}. Most initiatives in this

thesis have timelines for mitigation actions on the twenty to fifty-year scale. The initiatives’ implementation timelines have varying levels of detail.

Building adaptive capacity for Louisiana government and community systems is a stated goal of multiple initiatives analyzed in this thesis. Adaptive capacity is a communities’ ability to adapt while using its own resources. As in Fankhauser et al.’s guide to adaptation decisions, communities achieve adaptive capacity through holistic inter-sector planning inclusive of community member input. Aspects of resilience must be considered to assess whether communities can manage future risk levels in the context of the given hazards they are exposed to in their local area.

Adaptation and mitigation issues are often approached with resilience models. Climate resilience is the ability of individuals or groups to cope with stress from hazards because of social, political, or environmental change in the climate crisis. Wilbanks defines resilient communities as communities that can prepare for and predict hazards, recover effectively from hazards in timely and equitable ways, and reduce any further

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risk\textsuperscript{77}. According to Wilbanks’ work on community resilience to hazards, many communities exposed to natural hazards repeatedly in relatively short periods are in rural areas\textsuperscript{78}. At the community scale, climate resilience is achieved by informed adaptive and mitigative actions\textsuperscript{79}.

In Louisiana, data from the LASAFE plan suggests that since 2000, high-risk areas have lost population, and low-risk areas have gained population. Both higher and lower ground with substantial structural protection has gained population\textsuperscript{80}. Population loss in high-risk rural regions depreciates real estate value, lowers median income, and governments end up with fewer public funds\textsuperscript{81}. Overall, the data suggests that people with more financial resources are moving, leaving people with lower socioeconomic status in high-risk areas\textsuperscript{82}. People with fewer financial resources typically have less

\begin{footnotesize}
\begin{itemize}
    \item Wilbanks TJ. 2008. Enhancing the Resilience of Communities to Natural and Other Hazards: What We Know and What We Can Do. Natural Hazards Observer. 32:10-11.
    \item Wilbanks TJ. 2008. Enhancing the Resilience of Communities to Natural and Other Hazards: What We Know and What We Can Do. Natural Hazards Observer. 32:10-11.
    \item Carey J. 2020. Managed retreat increasingly seen as necessary in response to climate change’s fury. PNAS. 117(24):13182–13185.
\end{itemize}
\end{footnotesize}
flexibility in their means and are not available to move freely\textsuperscript{83}. Real estate values in high-risk areas have dropped, making selling property more difficult\textsuperscript{84}. This makes these populations increasingly vulnerable as it is increasingly difficult for them to leave these high-risk areas. Population change, although incremental, has state-wide infrastructural impact\textsuperscript{85}.

Infrastructural adaptive and mitigative actions are major foci of all initiatives analyzed in this thesis. Some types of infrastructure adaptation and mitigation action in Louisiana are flood protection and prevention, transportation maintenance, wastewater management, and wetland restoration. Infrastructural change informed by climatological data and hazardous climate conditions mitigates future risk\textsuperscript{86}. Geographical context informs infrastructural mitigative and adaptive actions\textsuperscript{87}. Adaptation and mitigation actions to natech-specific infrastructural issues\textsuperscript{88} are relevant to Louisiana’s industrial

\textsuperscript{86}Lafourche Parish Council. 2014. Lafourche Parish, Louisiana Comprehensive Resiliency Plan.
\textsuperscript{87}Wilbanks TJ. 2008. Enhancing the Resilience of Communities to Natural and Other Hazards: What We Know and What We Can Do. Natural Hazards Observer. 32:10-11.
sectors. This study contributes to research\textsuperscript{89} on infrastructural change in the Gulf South as it interacts with climate hazards and the need to mitigate and adapt to climate change in Louisiana.

This study utilizes a multi-scalar analysis of different plans in Louisiana informed by the 2005 hurricane season. The multiple scales observed in this analysis are the state and local scales, and more specifically, the state, parish, and New Orleans (or urban) scales. Singular plans relevant to this thesis have been analyzed, however not in comparison to one another or across geographic scales. Very few studies relevant to this research incorporate a comprehensive textual analysis of multiple plans at different scales. The specific fields that this study contributes to are urban and rural mitigation and adaptation, hazard risk reduction, community resilience, and Louisiana climate change literature overall. This study contributes as a multi-scalar analysis involving crossover from the given fields, as well as robust qualitative analysis.

Louisiana’s geography and climate contribute to its status as arguably the most at-risk state to climate change\textsuperscript{90}. Louisiana is the most prone to flood hazards in the US\textsuperscript{91}. Flood risk is just one of the hazards addressed by adaptation and mitigation


actions in the initiatives. These actions include policy remediation, federal and state intervention, infrastructure change, and collaboration of stakeholders at all strata\(^92\).

Louisiana’s coastline is subject to many adaptive and mitigative strategies outlined in the initiatives at risk of many hazards. Different geographic and climatic risks inform coastal mitigation and adaptation strategies than the rest of the state\(^93\). Specific to Louisiana, the coastline is economically crucial to multiple industries\(^94\). Many challenges currently exist for coastal populations aside from climate hazards. Living in floodplains is costly\(^95\), and for marginalized communities who have historically been prevented from wealth accumulation, moving is not feasible\(^96\). Addressing the many risks posed to both the environment and the coastal populations is crucial for the future of Louisiana.

Existing literature analyzes climate plans on particular scales, or focuses on one plan. This thesis focuses on multiple plans and multiple scales. Existing literature

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critiques and analyzes single plans such as Randolph’s critique of the Coastal Master Plan. Several opportunities for analysis are met, such as social, economic, and political analysis, but only on the scale of one plan and one scale. Within the existing literature there is a gap of analyses of multiple plans and multiple scales. Thinking across scale, or multiscalar analysis, is essential to climate change. Climate change issues are inherently multiscalar and interdisciplinary. This study conducts analysis on multiple plans at multiple scales, both urban and rural at the local scale, and at the state level. Comprehensive planning needs to be executed and integrated at multiple scales to be holistic.

Louisiana’s geography is vital to its economic success and vulnerability in the climate crisis. As emphasized in Louisiana’s Comprehensive Master Plan for a Sustainable Coast, multiple industries rely on the coast for their success. Besides inland chemical and material manufacturing; seafood and agribusiness, The Mississippi River Delta also provides crucial access to the Gulf of Mexico for offshore oil drilling, international oil import, and trade. Analyzing how state and local initiatives have planned and continue to plan for the future in various aspects of state and local

100 Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.
economies is relevant to numerous disciplines, trades, and sectors. This analysis directly informs Louisiana’s adaptive capacity. Economic adaptive capacity is a crucial aspect of mitigating financial risk for many sectors and industries in Louisiana.

Various climate hazards Louisiana is dealing with, has historically dealt with, and will continue to face in the future are detailed in 2.1 *Louisiana’s changing coast & climate*. Climate hazards are remediated through adaptation, mitigation, and tangible problem solving like the policy and infrastructure-based initiatives analyzed in this thesis. Languishing and inaction are perhaps some of the most dangerous risks of the climate crisis and the hardest to predict. One of the foremost issues in the US concerning mitigation and adaptation is creating policy and infrastructure change. When it is created, following through and implementing the given policy to the letter is an additional struggle surrounding this issue.

In a state with vulnerable populations exposed to such a variety of climate, technological, and natech hazards, the climate initiatives at the state and local level need to be as thoroughly analyzed as possible. The parishes analyzed are very

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reliant on chemical, material, and energy industries, thus are very vulnerable to both climate and natech hazards\textsuperscript{106}. Understanding which climate hazards are addressed and which are unaddressed by adaptation and mitigation strategies in the initiatives will allow for policymakers, government stakeholders, and communities to strategize for additional best climate practices. This thorough analysis will contribute to better preparation for disaster, hazard risk reduction, and community resilience.

2.3. Context & geography of climate initiatives in Louisiana since 2005


Six of the initiatives are at the local scale, either individual parishes or New Orleans. The New Orleans parishes are either strictly New Orleans proper (synonymous with Orleans Parish) or the Greater New Orleans Metropolitan Area. Three initiatives are at the state scale. This section will give a comprehensive review of the context and geography of New Orleans first, and then specific details of each of the New Orleans initiatives. Context and geography will also be given for the other three parish-specific local-level initiatives. This section will also detail the context and particular geographies of state-level initiatives.
New Orleans, Louisiana, is a coastal city with significant flooding problems and one of the most socially vulnerable populations in the U.S\textsuperscript{107}. The city’s climate vulnerabilities arise from compounding issues, such as sea-level rise (SLR), dramatic regional land subsidence, coastal erosion, flooding along the Mississippi River, tropical


cyclone storm surge, and heavy rainfall events\textsuperscript{108}. Recent observational research has provided evidence that heavy precipitation events have become more frequent in New Orleans and across the southeastern United States, consistent with a warming climate\textsuperscript{109}. For example, Brown et al. found that precipitation events are becoming shorter and more intense over time\textsuperscript{110}. Extreme precipitation events are expected to increase frequency and intensity under most climate scenarios\textsuperscript{111}, increasing stress on New Orleans’s already outdated water infrastructure. Many populations in the metropolitan area were displaced during the 2005 hurricane season, causing demographics to shift rather abruptly\textsuperscript{112}.

The three New Orleans-focused plans have different foci within the same geographic area. The Greater New Orleans Urban Water Plan focuses on water management infrastructure and changing how Greater New Orleans faces water-related hazards within the infrastructure. Resilient New Orleans and Climate Action for a Resilient New Orleans are relatively similar in focus and approach but have different


2.2.1. Resilient New Orleans: Strategic Action to Shape Our Future City

Resilient New Orleans, created by the City of New Orleans in 2015, is a series of strategies and detailed actions planning in a city at risk to many natural and technological hazards. Some central themes addressed in this plan are equity, adaptation, and economic development. This plan’s actions are organized under three themes: Adapt to Thrive, Connect to Opportunity, and Transform City Systems. This plan highlights fourteen strategies and select actions already in progress by the city. This plan is in partnership with the 100 Resilient Cities Initiative of the Rockefeller Foundation. Agencies responsible for these actions and strategies including the City of New Orleans, the Sewerage and Water Board of New Orleans, the New Orleans Redevelopment Authority, Water Wise NOLA, and the Louisiana Public Health Institute are responsible for implementation and status reports.

2.2.2. Greater New Orleans Urban Water Plan

Waggonner & Ball, a New Orleans architecture and environment firm, created the Greater New Orleans Urban Water plan in 2013. This plan is a series of three documents: vision, urban design, and implementation. The vision plan is analyzed in

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this thesis as it summarizes the most content out of the three plans and is the most accessible of the three. This plan addresses and analyses stormwater management, subsidence, flooding, wastewater, surface, and groundwater. Instead of pumping, circulating, and recharging groundwater, the plan emphasizes slowing and storing stormwater runoff. This plan re-imagines water infrastructure in Greater New Orleans. It proposes revamping public spaces around water for recreation and infrastructural purposes. The program includes both urban land uses and wetland areas.

This plan addresses how the climate crisis affects and will continue to affect Greater New Orleans. Various climate hazards, including hurricanes, sea level, subsidence, saltwater intrusion, and flooding, are addressed in the infrastructural changes in this plan. This plan analyzes how the current water infrastructure program in Greater New Orleans is expensive, resource-intensive, and not consistently effective. Street flooding is a primary concern that existing water infrastructure does not consistently prevent or address. The existing water infrastructure is also the leading cause of subsidence within the urban levee system\textsuperscript{114}.

Various Greater New Orleans communities are prioritized in this plan, making equity a prevalent theme. One of the most prominent themes in this plan is the phrase “living with water”/”live with water,” which is central to the program's infrastructural and engineering content and philosophy. Waggonner & Ball reserves this term and defines it as “...an approach to water-resilient urban and building design developed by Waggonner & Ball in the years since Hurricane Katrina. Living with Water begins the

process of transforming water from threat to asset.”115 This phrase is not unique to this initiative and will be discussed further in this text.

2.2.3. Climate Action for a Resilient New Orleans

Climate Action for a Resilient New Orleans updates the 2017 initiative Resilient New Orleans with tangible greenhouse gas reduction goals and actions to achieve them. This plan addresses sectors across the entire city while mitigating risk from the climate crisis.

The main objective of this plan is to reduce greenhouse gas emissions by 50% by 2030, with 2014 as the baseline year for emissions data. There are goals within this goal for other sectors – transportation, waste management, energy usage, energy production, and cultural issues. The main contents of this plan are strategies and goals, with detailed actions under each strategy to achieve the strategies and the goals. Like Resilient New Orleans, agencies are responsible for each action’s implementation and status reports. Equity and accessibility are emphasized in this plan.

2.2.4. Lafourche Parish, Louisiana Comprehensive Resiliency Plan

Lafourche Parish is a coastal parish in southeast Louisiana with over 70% white residents\textsuperscript{116}. Lafourche Parish, named after Bayou Lafourche, is historically and currently home to farmers and fishers\textsuperscript{117}. The high concentration of bayous and water-related climate hazards puts much of the parish at a high flood risk, though many areas

are within a levee protection system\textsuperscript{118}. On the coast of Lafourche, Port Fourchon is crucial to the oil and gas industry of the U.S. Port Fourchon connects 90\% of oil production in the Gulf to refining in the U.S. Land loss is a current and future hazard in Lafourche Parish. The Louisiana’s Comprehensive Master Plan for a Sustainable Coast predicted that Lafourche Parish could lose 41\% of parish land in the next 50 years with no mitigative action\textsuperscript{119}. Since the 1970s, Lafourche Parish has lost 40-50\% of its land\textsuperscript{120}.

Lafourche Parish, Louisiana Comprehensive Resiliency Plan was published in 2014 and adopted by the Lafourche Parish Council. Economic development, land use, resilience to climate hazards, and transportation in the next 20 years are the main focuses of this plan. The planning process of this document involved consistent communication with community members and local businesses. The Center for Planning Excellence and the Louisiana Office of Community Development were also involved in the planning process.

The main contents of this plan are resiliency strategies and policy recommendations. There are eight main topic areas: Land Use, Resiliency and Hazard Mitigation, Culture and Recreation, Housing Choices, Transportation Connections, Infrastructure, Economic Development, and Coordinating Effectively\textsuperscript{121}.


\textsuperscript{119}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.


\textsuperscript{121}Lafourche Parish Council. 2014. Lafourche Parish, Louisiana Comprehensive Resiliency Plan.
2.2.5. Vision 2030: Terrebonne Parish, Louisiana Comprehensive Plan

Terrebonne Parish is a coastal parish in southeast Louisiana. Oil and gas are the primary sources of revenue similar to Lafourche Parish, Terrebonne’s agricultural sector includes citrus, sugarcane, cattle, and vegetables. Terrebonne Parish exports a large amount of seafood\textsuperscript{122}. Vision 2030: Terrebonne Parish, Louisiana Comprehensive Plan, published in 2013, is an updated version of its previous version, published in 2004. This plan addresses new trends in climate hazards and population demographics, and social, cultural, and infrastructural issues and concerns from the public.

This plan identifies eight climate hazards as particularly impactful to Terrebonne Parish communities and the environment. These hazards are flooding, subsidence, coastal erosion (related to land loss), sea level rise, wind events (hurricanes and tornadoes), and storm surge\textsuperscript{123}. Ninety percent of land in Terrebonne Parish is classified as environmentally sensitive. Future development in the parish is limited due to this classification and the risk of subsidence and land loss. More than 192,700 acres of land were lost in Terrebonne Parish between 1932 and 2010\textsuperscript{124}. The Louisiana’s Comprehensive Master Plan for a Sustainable Coast predicted that Terrebonne Parish could lose 41% of parish land in the next 50 years with no mitigative action\textsuperscript{125}.

\textsuperscript{122}LSU AgCenter. 2022. About the Parish: Terrebonne. https://www.lsuagcenter.com/portals/our_offices/parishes/terrebonne/features/about
\textsuperscript{124}Lowlander Center. [nd]. Issues We Face: Land Loss. https://www.lowlandercenter.org/land-loss
\textsuperscript{125}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.
The Vision 2030 Terrebonne Parish plan analyzes the future likelihood of coastal population loss and likely population trends inland. Cultural identity and coastal community identity are addressed in this plan. The parish prioritized local participation in the planning process. Guiding principles and overarching goals containing policies, objectives, strategies, and actions are the main contents of this plan. The visions of the project are directly influenced by local participation.

2.2.6. St. Bernard Parish Coastal Zone Management Program

The St. Bernard Parish Coastal Zone Management Program (SBP CZMP) was created in 1982 and is a working document. This plan is the most recent update, published in 2013, and was initiated in 2009 in post-Hurricane Katrina conditions both physically and socioeconomically. Natural and anthropogenic hazards and elements heavily influence St. Bernard Parish. The overall goal for the program is to prioritize coastal restoration, protection, sea level rise planning, and resilience planning. This plan highlights resilience planning, wetland management and protection, coastal erosion prevention, and saltwater intrusion prevention. There are 22 updated goals in this plan.
The Louisiana Office of Community Development and Office of Coastal Zone Management regulate the SBP CZMP. The Coastal Impacts Assistance Program funded this update. The Louisiana Resiliency Assistance Program (LRAP) supports the community sections of this plan.

2.2.7. Louisiana Strategic Adaptations for Future Environments (LA SAFE) Adaptation Strategies

Formally a climate adaptation plan, LA SAFE received over $40 million in Community Development Block Grant funding from the federal government. The lead government partners are the Office of Community Development Disaster Recovery Unit and the Foundation for Louisiana. This plan was developed, researched, and authored by Waggoner & Ball Architects, Center for Planning Excellence, Concordia, GCR, APTIM, Pan American Engineers, and UNO-CHART.

This plan addresses climate hazards and resilience issues for six parishes in Louisiana, all of which were affected by Hurricane Isaac (2012). These parishes are Jefferson, Plaquemines, St. John the Baptist, Lafourche, St. Tammany, and Terrebonne. This project outlines a strategy addressing flood and land loss in the next 50 years. This plan defines the approach in three categories: Community Vision, Best Planning Practices, and Current and Future Environmental Conditions. The six parishes evaluated the community vision category by conducting extensive workshops.

In the surveying process, risk and adaptation needs were evaluated at the public level in every parish. A series of flood risk zones (low, moderate, and high) were evaluated.

126Office of Community Development. 2019. LOUISIANA RELEASES CLIMATE ADAPTATION STRATEGIES CREATED THROUGH LA SAFE PROGRAM’S REGIONAL APPROACH TO RESILIENCE. For Immediate Release. Disaster Recovery Unit.
developed using FEMA’s National Flood Insurance Program data and floodplain zones and the CPRA’s data for flood risk zones\textsuperscript{127}. The CPRA’s 2017 Master Plan, also analyzed in this thesis, was cited for much of the climate data – relative sea level rise, flood risk, subsidence, storm frequency, average storm intensity, and precipitation. Changes in the population dynamics of these parishes are analyzed in this initiative for implications of climate hazards over the past 20 years.

2.2.8. Louisiana’s Comprehensive Master Plan for a Sustainable Coast

The Coastal Protection and Restoration Authority released the most recent Coastal Master Plan in 2017. The CPRA was founded after the 2005 hurricane season to focus on coastal protection and restoration\textsuperscript{128}. The main component is creating and implementing the Coastal Master Plans (CMP). The Coastal Master Plans evaluate industry activity, local and state infrastructure, natural and anthropogenic climatic processes, water management, land use, planning in the short and long term, transportation, and wildlife and fisheries management as part of the planning process. The CMP executes scientific and engineering data collection and analyses and mapmaking in the plan-making process.

The empirical research conducted by the CPRA also informs the other initiatives in this thesis. The CPRA, as a government body, serves as an authority on coastal


\textsuperscript{128}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.
restoration and adaptation. Thus, the master plan is an essential reference for coastal restoration projects already in place or established in Louisiana.

**PROGRESS ON THE GROUND**

![Map of CPRA projects completed or funded for construction](image)

Figure 2.3. CPRA projects completed or funded for construction. Source: Louisiana’s Comprehensive Master Plan for a Sustainable Coast

The CPRA works on a wide variety of infrastructural projects across the entire Louisiana coastline. This figure categorizes these projects during the 2017 Coastal Master Plan and indicates that the projects are either completed or funded for construction. The projects in this plan inform other initiatives analyzed in this thesis. The two other state initiatives are closely informed by the CPRA and this initiative in material, projects, and content.

Some have deemed the priorities of this plan controversial\(^ {129} \). Many industries in Louisiana, specifically chemical, material, and non-renewable energies, function within

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\(^{129}\)Randolph N. 2018. License to extract: How Louisiana’s Master Plan for a Sustainable Coast is sinking it. Lateral 7(2).
and around the coast or use resources from the coast. This initiative highlights those industries as a priority, which has caused some pushback in discourse.\footnote{Randolph N. 2018. License to extract: How Louisiana’s Master Plan for a Sustainable Coast is sinking it. Lateral 7(2).}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{flood_risk.png}
\caption{CPRA predicted flood risk to our communities.}
\end{figure}

\textbf{Source: Louisiana’s Comprehensive Master Plan for a Sustainable Coast}

This figure indicates the predicted flood risk for the entire Louisiana coast on a scale of flood depths for a 100-year flood event. A 100-year flood event describes the return interval of the event. This means that an event of that magnitude has a 1\% chance of occurring in a given year.

\section*{2.2.9. Louisiana Climate Action Plan}


\footnotesize{Silvis V. 2020. Uncertainty, policy implementation, and the 2012 Louisiana coastal master plan.}
consists of 23 individuals from different sectors and industries in the state. The planning process of this initiative included multiple groups led by each task force member and many public meetings for community input. Individuals of different positionalities and biases were present throughout the planning process of this initiative.

The plan's overall goal is to reduce greenhouse gas emissions to 50% (using 2005 as a baseline for GHG levels) by 2050. There are 28 strategies and 84 actions outlined in the plan that involve lowering emissions across the entire economy. The main target sectors are coal and petroleum refining, natural gas processing, chemical manufacturing, and commercial and electric power. The greenhouse gas target reduction goal matches that of the current federal greenhouse gas target reduction goal, put into place by President Biden in November 2021\(^\text{132}\). This plan seeks to achieve the future resilience of Louisiana, strengthen the coast, and mitigate the risk of the climate crisis.

Climate issues across Louisiana are addressed based on historical, current, and predicted events. The hazards outlined in this plan are relatively holistic, covering climatic and social issues within the climate crisis. This plan is the first state-wide climate action plan in the Gulf South\(^\text{133}\).


Chapter 3. Methods

The data, the nine publications, are listed below in Table 1. This study uses two qualitative analyses to investigate how state and local agents have addressed mitigation and adaptation in the nine initiatives. The data analyzed in this thesis are the planning documents proposing specific initiatives. I use content analysis to assess the volume of adaptation and mitigation topics in each plan. I use thematic analysis to determine what themes are present in the initiatives by coding. I combine content analysis and thematic analysis to strengthen the validity of the results. This section explains the rationale of the research design and its steps.

Table 1. Initiatives Analyzed in this Thesis

<table>
<thead>
<tr>
<th>Initiatives at the town and parish level</th>
<th>Initiatives at the state level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lafourche Parish, Louisiana Comprehensive Resiliency Plan (2014)</td>
<td>Louisiana Climate Action Plan (2022)</td>
</tr>
<tr>
<td>St. Bernard Parish Coastal Zone Management Program (2013)</td>
<td></td>
</tr>
<tr>
<td>Greater New Orleans Urban Water Plan (2013)</td>
<td></td>
</tr>
<tr>
<td>Climate Action for a Resilient New Orleans (2017)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author
The data are several Louisiana state and local initiatives from 2005 to 2022. All of these plans are publicly available. If the plan pertains to a specific city or parish, it is available on the respective city or parish’s government website. Two valuable resources for state climate policy are the Georgetown Climate Center\textsuperscript{134} and their Adaptation Clearinghouse\textsuperscript{135}. These resources link to the planning documents for each initiative in this thesis. The planning documents are also available directly from their authors or respective parishes, regions, or organizations. The chosen state and local initiatives chosen for this analysis share several core traits: their localities’ exposure to and historical experience with various climate hazards; they are comprehensive and climate crisis-informed with adaptation and mitigation actions. The experiences of the 2005 hurricane season and its impacts inform all the planning documents. Because this analysis focuses on the planning documents and not the implementation of the initiatives themselves, there are limits to the lengths in which the initiatives can be discussed. Implementation of the initiatives is difficult to discuss due to the lack of clarity in implementation timelines.

St. Bernard Parish, Lafourche Parish, and Terrebonne Parish are vulnerable to several climate hazards: hurricanes, flooding, tornadoes, precipitation, extreme heat, subsidence, sea-level rise, saltwater intrusion, and land loss\textsuperscript{136}. New Orleans is similarly

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{134}Georgetown Climate Center. https://www.georgetownclimate.org/.
\item \textsuperscript{135}Adaptation Clearinghouse. https://www.adaptationclearinghouse.org/.
\item Lafourche Parish Council. 2014. Lafourche Parish, Louisiana Comprehensive Resiliency Plan.
\end{enumerate}
\end{footnotesize}
vulnerable to these hazards\textsuperscript{137}. The state initiatives assess risk across Louisiana and highlight particularly vulnerable areas such as urban areas, isolated rural areas, and the coastline. Assessing climate initiatives in Louisiana will contribute to the knowledge of how at-risk coastal regions in the state adapt to and mitigate climate hazards.

The first analytical method is a content analysis framework from Reckien et al.\textsuperscript{2014}\textsuperscript{138} designed to evaluate adaptation and mitigation topics and strategies from each initiative. There are five mitigation topics and six adaptation topics. This study applied their framework with minor adjustments made to fit the geographic context of Louisiana better.


The adaptation and mitigation topic analyses are word and phrase conceptual content analyses\textsuperscript{139}. This method utilizes a word and phrase count from the initiatives’ content. The initiative can list each topic in whole or in part of the phrase to fit the criterion for analysis\textsuperscript{140}. Many of the topics are phrases and not singular words, so multiple searches were conducted for that topic. For example, when performing the


\textsuperscript{140}Krippendorff K. 2018. Content analysis: An introduction to its methodology. Sage publications.

adaptation topics analysis, these phrases and words were searched for “flood management” and “flood.”

The analysis assesses how many times each adaptation and mitigation topic appears in each planning document. This method highlights specific adaptation and mitigation actions present in each initiative while also elucidating which adaptation and mitigation actions are excluded from the initiatives. This analysis aims to understand which initiatives are adapting and mitigating climate crisis issues by addressing climate hazards through concrete mitigative and adaptive efforts.

The analysis is summarized in two tables that indicate the respective topics and the number of times they appear in a document (Table 2 and 3). Bar graphs enable comparison of which topics were most frequently named in the initiatives.

Table 2. Sample structure for content analysis, mitigation topics

Initiative:

Authored by: (Year published)

<table>
<thead>
<tr>
<th>Mitigation topics</th>
<th>Volume of topic in initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency</td>
<td>x</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>x</td>
</tr>
<tr>
<td>Transportation</td>
<td>x</td>
</tr>
<tr>
<td>Waste management</td>
<td>x</td>
</tr>
<tr>
<td>Urban planning &amp; management</td>
<td>x</td>
</tr>
</tbody>
</table>

Where “x” is the number of times each topic appears in the given initiative.

Source: Author
Table 3. Sample structure for content analysis, adaptation topics

Initiative:

Authored by: (Year published)

<table>
<thead>
<tr>
<th>Adaptation topics</th>
<th>Volume of topic in initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water management</td>
<td>x</td>
</tr>
<tr>
<td>Health issues (extreme heat)</td>
<td>x</td>
</tr>
<tr>
<td>Flood management</td>
<td>x</td>
</tr>
<tr>
<td>Wetland management</td>
<td>x</td>
</tr>
<tr>
<td>Agriculture</td>
<td>x</td>
</tr>
<tr>
<td>Fisheries management</td>
<td>x</td>
</tr>
</tbody>
</table>

Where “x” is the number of times each topic is mentioned in the given initiative.

Source: Author

This framework and its mitigation topics are relevant to Louisiana. This study framework changed some mitigation and adaptation topics from its source in the analyses for clarity and specificity to Louisiana’s geographical context. Urban planning and management replaced energy saving in the mitigation topics analysis. Urban planning and management are more relevant to the initiatives analyzed in this thesis. Although the Louisiana Climate Action Plan has a section titled *Clean Energy Transition*, which emphasizes changes in the energy sector, it is not a widely relevant topic in the initiatives. Strategic planning while taking climate hazards into account in Louisiana’s urban areas is a form of climate mitigation. The initiatives in this thesis discuss infrastructural changes at many levels, many of which are in an urban context, making urban planning and management a relevant topic.
This research design made multiple modifications to the adaptation topics content analysis framework. Wetland management was added to replace forest management. Forest management is not widely discussed in the initiatives in this thesis, whereas wetland management is a relevant issue in many of the initiatives because of their geography. In this study, health issues include a modified subtopic of extreme heat. Extreme heat is a considerable climate hazard in Louisiana\textsuperscript{141}. Many local and state initiatives include adaptive measures to adapt to extreme heat\textsuperscript{142}. Fisheries management was added to the adaptation analysis. Fisheries management is a crucial economic sector in the state which, like agriculture, adapts to predicted climate hazards and affects various populations in the state\textsuperscript{143}. Fisheries management is a relevant adaptive action in multiple initiatives analyzed in this thesis\textsuperscript{144}.

The qualitative limitations of this analysis framework are the lack of robustness. The conclusions drawn have limited depth by conducting a series of word and phrase counts from various texts.\textsuperscript{145} Thematic analysis, contrasting with content analysis, finds


patterns of overall themes in completed data sets\textsuperscript{146}. Using thematic analysis techniques to frame my content analysis results will create an ideal, robust set of analyses for my data.

The choice of this study as the main framework for the analysis of this dataset also has limitations. Reckien et al. 2014 conducted the original research on 200 urban areas in Europe, a contrasting urban demographic from the population geography of some of the initiatives in this thesis. The areas within this study are a mix of urban and rural. Additionally, most of the literature supporting the original study focuses on mitigation and adaptation strategies for cities. However, literature on rural and community climate adaptation and resilience was consulted and studied for reference\textsuperscript{147}. Local versus state level as a lens of comparison is more central to this thesis than urban versus rural. Literature on the climate adaptation and mitigation at the local scale was consulted for this analysis\textsuperscript{148}.


Content analysis implications bolster the thematic analysis results and how both analyses intersect\textsuperscript{149}. Two related analyses allow for more specific conclusions and implications from both analyses to be compared\textsuperscript{150}. The content analysis-informed results will view the data through an additional lens to discuss the themes from the thematic analysis with an overall nuanced perspective. After executing content analysis, I conducted an inductive thematic analysis of the same nine initiatives. Thematic analysis is combined with content analysis in this study to increase the robustness of the results\textsuperscript{151}.

The thematic analysis utilizes an inductive approach with the research questions as a general framework. Executing the inductive thematic analysis helps elucidate how the initiatives analyzed in this thesis frame and define mitigation and adaptation and what major climate issues are addressed and unaddressed. Using the inductive approach with thematic analysis allows themes to develop during the coding process as determined by the data\textsuperscript{152}. The thematic analysis utilized in this thesis is reflexive thematic analysis. The reflexive thematic analysis uses inductive coding without a set

\begin{flushleft}
\end{flushleft}
codebook at the start of data collection, which is synergistic with the inductive approach to the analysis framework\textsuperscript{153}. Codes are set before and during the data collection and coding process. See Table 4 for the codebook used in the thematic analysis.

Twenty data samples code each initiative\textsuperscript{154}, with 180 data samples in total. Data are selected from the texts based on general topic relevance and location in the text\textsuperscript{155}. Data are selected for general topic relevance with the research questions as a guide\textsuperscript{156}. Data are selected by location within the text to ensure that samples from each section are included. Before data collection, all plans are reviewed in detail. All sections of each text are reviewed in detail during data collection to ensure that samples are included from all parts of the text. Literature provides various guidelines for choosing the number of data samples, but few references exist for this particular type of study\textsuperscript{157}. Sandelowski and Fugard et al. argue that choosing data sample size and particular aspect of data (in the case of this study, location within each text) should be assessed by researcher experience and be relative to the overall research framework\textsuperscript{158}. The data samples were selected in accordance with literature guidelines on data excerpt lengths\textsuperscript{159}. This analysis has seven themes, with literature suggesting between five and

\textsuperscript{153}Guest G, MacQueen KM, Namey EE. 2014. Applied Thematic Analysis. SAGE Publications, Inc. : https://dx.doi.org/10.4135/9781483384436
\textsuperscript{157}Braun V, Clarke V. 2013. Successful qualitative research: A practical guide for beginners. Sage.
ten themes as ideal\textsuperscript{160}. Literature suggests this number of themes based on the goal to create concise and clear results and discussion sections.

The coding process assigns codes to the data three times. The first is for general codes, the second is for initial codes, and the third is for established codes. General codes are general descriptions of the text and observations. Initial codes are more specific, and also potential repeated codes from the first round of coding. Established codes are narrowed down to the codes seen in the codebook. Established codes are reached by eliminating irrelevant codes from the code set and finding patterns in the code set\textsuperscript{161}.

All data are coded in the first round, then the second round, then the third, instead of coding one datum three times before proceeding to the next. Themes are derived from the code list during and after the coding process. Chapter 4 has data samples from the initiatives giving context to each theme. Themes change throughout the data collection and analysis process, as do the codes. Theme change is due to eliminating irrelevant codes, changing groups of code patterns, and therefore changing overall themes.

Some codes are related categorically to more than one theme. For example, the flood management code is under the living with water theme. Flood management could also be defined as water infrastructure, therefore falling under the infrastructure theme.

Flood management could also be related to climate hazards because floods are a climate hazard. Codes are not repeated under themes in the codebook to avoid redundancy of data\textsuperscript{162}.

Figures will represent the thematic analysis results by reporting the volume of themes present in each initiative from the coding process. In each of the twenty data samples, codes are recorded. By the third round and the end of the coding process, each code is related to a theme and an overall pattern\textsuperscript{163}. The figures show which themes were present in each data sample based on codes within that theme recorded in each data sample. For example, infrastructure may be reported in fifteen out of twenty data samples (75%) because codes relating to infrastructure were recorded in 75% of the data samples.

The results also discuss various implications and patterns observed. The relationship between the themes and the geography of the initiatives are discussed. Results of individual initiatives’ themes are discussed in comparison with one another. The implications of the presence of themes in initiatives will be discussed, and the implications of the lack of themes.

This thematic analysis has some limitations. The twenty data samples taken from each planning document are not a complete representation of each document, thus

\textsuperscript{162} Thomas DR. 2003. A general inductive approach to qualitative data analysis. School of Population Health. University of Auckland, NZ.


excluding some content from the coding process. Thematic analysis is also subjective to the researcher to some extent because of the decisions that are made during the coding process. This is addressed by reflecting on personal biases and perceptions, before, during, and after the process.

Both methods applied in this study require reflection on personal biases and preconceptions before the coding process\textsuperscript{164}. Asking reflective questions such as “what are people trying to accomplish?”, “what is the broader impact?”, “what surprises you?”, “what intrigues you?”, “how was this done?” and “who does this affect?”\textsuperscript{165} limits bias within the coding processes in both methods. These questions reflect upon my personal biases, experiences, and preconceptions concerning the issues in this research, and will confront any biases and preconceptions at the start of the research process.


Chapter 4. Results

4.1. Content analysis results

The adaptation and mitigation topic content analyses are presented in this chapter using figures and explanations with context from the initiatives and the methods\textsuperscript{166}. These conceptual content analyses were completed for the six local and the three state-level initiatives.

This method highlights specific adaptation and mitigation actions planned in each initiative. This analysis contributes to understanding how the initiatives adapt and mitigate climate crisis issues by addressing climate hazards through concrete mitigative and adaptive efforts.

Figure 4.1. Most frequently named adaptation topics from content analysis

Adaptation topics are typically larger-scale climate actions than mitigation topics\textsuperscript{167}. The topics discussed in this analysis are related to multiple sectors and are managed at the local and state level by the plans reviewed in this thesis\textsuperscript{168}. The precise volume of topics in each initiative can be found in Appendix B, Content analysis figures.


Flood management, water management, and wetland management are related to hazard risk reduction and disaster management more broadly. Health issues; not a limiting category, implicates social, economic, and broader public health issues. These adaptation topics exist on broader scales than many mitigation topics and related mitigation actions.

All of Louisiana is prone to water-related climate hazards, thus the volume of water management and flood management in the initiatives' adaptation topics analyses. Water management codes were almost half of the adaptation topics mentioned. LA SAFE particularly has flood risk in mind, given the risk of the plan's six parishes' proximity to the coast, the risk of coastal climate hazards, and historical experience with floods and water-related climate hazards. The initiatives universally include water management and flood management infrastructural planning in their adaptation actions. Water-related climate hazards occur relatively often in Louisiana; thus, flood infrastructure maintenance is necessary to mitigate further risk.

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management is a concern across Louisiana that varies with parish geography\textsuperscript{174}. The Greater New Orleans Urban Water Plan reimagines the water infrastructure and water management of the Greater New Orleans area, including the levee infrastructure system\textsuperscript{175}. Stormwater management is also reimagined as an adaptation action in this plan, as one of the most common issues in New Orleans is street flooding\textsuperscript{176}.

Wetland management was discussed frequently in the parish plans. As coastal parishes, Terrebonne, Lafourche, and St. Bernard have significant wetlands. Wetlands in Louisiana are at risk because of coastal land loss. Some of this land loss is due to anthropogenic influence from industrial activity and climate change\textsuperscript{177}. The Greater New Orleans Urban Water Plan and the St. Bernard Parish Coastal Zone Management Plan discuss the importance of Louisiana’s coastal wetlands as a buffer zone for coastal flooding and storm surges\textsuperscript{178}. Wetlands act as natural water and flood protection infrastructure\textsuperscript{179}. The St. Bernard Parish Coastal Zone Management Plan and the 2017 Coastal Master Plan discussed wetlands protection through coastal restoration.

\textsuperscript{177}Houck OA. 1983. Land loss in coastal Louisiana: causes, consequences, and remedies. Tulane Law Review. 58:3.
The discussion of health issues was concentrated in the New Orleans initiatives and one of the state initiatives. Being an urban area, New Orleans has a population that is prone to many climate-related health issues. New Orleans’ population is at risk of higher heat stress because of the urban heat island effect. The New Orleans initiatives discuss actions to adapt to increasing heat stress because of their unique geography and climate. Some of these actions include increasing greenspaces in the city, strengthening the energy utility when power outages in summer have led to heat-related deaths, and explicitly serving groups at higher risk of health issues (disabled, children, elderly). These actions are detailed in Resilient New Orleans and Climate Action for a Resilient New Orleans.

Extreme heat causes more deaths in the US than any other climate hazard. The Louisiana Climate Action Plan highlighted the increasing risk of extreme heat in rural and urban environments. Anthropogenic climate change increases mean summer

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temperatures in Louisiana\textsuperscript{184}, which affects rural and urban settings. Increasing occurrences of heatwaves will affect the rural agricultural industry\textsuperscript{185}. The Louisiana Climate Action Plan emphasizes planning in all communities with extreme heat in mind.

The initiatives named agriculture and fisheries management relatively less frequently. The New Orleans plans typically did not often discuss fisheries management and agriculture. The overall urban focus of the New Orleans plans excludes many agricultural and industrial sectors. Resilient New Orleans did not name fisheries or agriculture once. However, New Orleans is a prominent port, and the parishes within the Greater New Orleans area are involved in the seafood industry\textsuperscript{186}.

The initiatives discussing fisheries and agriculture were either the state-level plans discussing aspects of Louisiana’s economy\textsuperscript{187}, or the rural parish plans discussing aspects of their economies\textsuperscript{188}. The 2017 Coastal Master Plan discusses coastal restoration efforts that affect some local fisheries. Terrebonne, Lafourche, and St. Bernard Parishes have robust seafood industries. The Louisiana Climate Action Plan


\textsuperscript{187}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.

discussed how broadly, extreme weather events have drastic impacts across agricultural and seafood sectors in Louisiana\textsuperscript{189}. The local community input from LA SAFE and the three parish plans indicates concern from community members about job survival and survival of the seafood and agricultural industry in the context of these initiatives’ adaptation and mitigation actions.

![Figure 4.2. Most frequently named mitigation topics from content analysis](image)

Many mitigation topics address technological or structural issues. Adaptation topics and actions are often more abstract than mitigation actions\textsuperscript{190}. The mitigation topics addressed in this analysis are all aspects of infrastructure that address various technological and structural challenges. The precise volume of topics can be found in Appendix B, Content analysis figures.

Transportation and urban planning & management are often discussed across the initiatives. The initiatives that frequently name urban planning & management are New Orleans plans, thus being in a concentrated metropolitan area. These initiatives, Resilient New Orleans and the Greater New Orleans Urban Water Plan discuss urban planning-focused adaptation and mitigation climate actions in detail as some of the main focuses of the plans.

In the rural parish plans, urban planning & management are discussed in the context of raising the quality of life. All three parish plans dedicate adaptation and mitigation actions to urbanization and funding urban centers for community development in their parishes\textsuperscript{191}. These actions work in conjunction with transportation actions in these plans, which are also discussed in raising the quality of life. Lack of access and the existence of public transportation infrastructure is an ongoing problem in these parishes. Connecting populations is a goal of the parish initiatives to raise the


quality of life, as requested from community input to the plans\textsuperscript{192}. Smaller-scale actions are proposed as climate mitigation items, such as lower carbon emissions vehicles\textsuperscript{193} and increased bike paths for recreation and transportation\textsuperscript{194}.

Transportation is the most frequently mentioned mitigation topic across the initiatives at almost 50\% of the topics analysis. Amongst the initiatives, adaptation and mitigation actions include transportation in different ways. In Climate Action for a Resilient New Orleans and the Louisiana Climate Action Plan, the overall focus of the plan is on the emissions reduction strategy. Therefore, transportation is highlighted as a source of emissions production. Questions are asked as to how to lower emissions in transportation, and actions are proposed to mitigate emissions in transportation and propose different transportation technologies with lower emissions impact.

Community input concerning transportation from the New Orleans and parish initiatives is similar: people want more reliable public transportation. In the community input sections of these initiatives, transportation was almost universally discussed and therefore recorded in the codes of this analysis. The local planning exemplified in the parish initiatives is an example of community-based adaptation and resilience planning\textsuperscript{195}. Community resilience is a common theme in the plans across the parish and New Orleans scales.

\textsuperscript{192}Lafourche Parish Council. 2014. Lafourche Parish, Louisiana Comprehensive Resiliency Plan.
The most predominantly discussed waste management topic amongst all initiatives was wastewater management. Wastewater management was detailed in-depth in the rural parish initiatives, notably St. Bernard Parish’s Comprehensive Plan. This plan’s infrastructural mitigation efforts are highly detailed. The wastewater planning is comprehensive, but no other waste management is discussed.

Energy efficiency and renewable energy were not frequently discussed, with both topics individually mentioned in less than 7% of all initiatives. Although Louisiana is a high carbon-emitting state\textsuperscript{196}, energy efficiency was not discussed frequently in the planning documents. When energy efficiency was discussed, it was in the context of small-scale and short-term actions. For example, using an “energy alternative” to gasoline in vehicles to produce fewer, but still some, emissions\textsuperscript{197}. This will be further discussed in the discussion section.

Renewable energy does not represent a high portion of Louisiana’s energy usage\textsuperscript{198}. The Louisiana Climate Action Plan and Climate Action for a Resilient New Orleans also discuss action strategies for emissions reduction, however they are vague. Although the emissions reduction goals for these plans are both under 30 years from the present day, transition to renewable energy was not discussed in detail in these initiatives.


4.2. Thematic analysis results

This section defines the themes using data samples from the initiatives and the coding process to give context to each theme. The results from the thematic analysis will be presented using figures to highlight the volume of the themes from each initiative. The figures highlighting results from the coding process show how many of the twenty data samples from each initiative contained codes for each theme. Data are referenced from the initiatives to support the figures. This method elucidated the initiatives’ approach to climate mitigation and adaptation by creating specific nuanced codes. This method highlights what major climate issues are addressed and unaddressed.

Codes were set before and during the data collection and coding process, citing the inductive coding approach\textsuperscript{199}. After three rounds of coding, a codebook was generated to map the established themes and codes (Table 4), and the samples were analyzed according to this codebook. The themes of the thematic analysis were derived during and after the coding process. The themes were chosen based on the topics present in the initiatives that became codes. Codes were grouped in patterns of relevance to one another, as shown in the codebook (Table 4). The patterns of codes led to the formation of themes. The themes changed throughout the coding process, as did codes. The theme change is due to eliminating irrelevant codes, changing groups of code patterns, and therefore changing overall themes.

Table 4. Thematic analysis codebook

<table>
<thead>
<tr>
<th>Resilience</th>
<th>Urban resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Community resilience</td>
</tr>
<tr>
<td></td>
<td>Infrastructure resilience</td>
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<tr>
<td></td>
<td>Sustainability</td>
</tr>
<tr>
<td>Climates hazards</td>
<td>Climate hazards, past</td>
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<tr>
<td></td>
<td>Climate hazards, present</td>
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<tr>
<td></td>
<td>Climate hazards, future</td>
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<tr>
<td></td>
<td>Hazards and disasters</td>
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<tr>
<td>Living with water</td>
<td>Wetland management</td>
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<td></td>
<td>Flood management</td>
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<td></td>
<td>Coastal restoration</td>
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<td></td>
<td>Levees</td>
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<td></td>
<td>Canals</td>
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<tr>
<td>Risk</td>
<td>Vulnerability</td>
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<tr>
<td></td>
<td>Hazard risk reduction</td>
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<tr>
<td></td>
<td>Planning</td>
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<tr>
<td></td>
<td>Industry hazards</td>
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<tr>
<td>Infrastructure</td>
<td>Urban infrastructure</td>
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<tr>
<td></td>
<td>Planning infrastructure</td>
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<tr>
<td></td>
<td>Housing</td>
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<tr>
<td></td>
<td>Transportation</td>
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<tr>
<td></td>
<td>Government, government cooperation</td>
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<tr>
<td></td>
<td>Utilities</td>
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<tr>
<td></td>
<td>Energy, renewable energy</td>
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<tr>
<td></td>
<td>Industry (chemical, energy, material, agriculture)</td>
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<tr>
<td>Equity</td>
<td>Access, accessibility</td>
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<tr>
<td></td>
<td>Education</td>
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<td></td>
<td>Communication</td>
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<tr>
<td></td>
<td>Economic strategy</td>
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<tr>
<td></td>
<td>Health</td>
</tr>
<tr>
<td>Human impact</td>
<td>Contribution to climate change</td>
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<tr>
<td></td>
<td>Emissions</td>
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<tr>
<td></td>
<td>Land use</td>
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<tr>
<td></td>
<td>Natural resource use</td>
</tr>
<tr>
<td></td>
<td>Ozone impact</td>
</tr>
</tbody>
</table>

64
The infrastructure theme contains the most codes of any theme. These themes can be construed as broad topics but having more codes than the other theme in the analysis indicates a theme as especially broad.

For the analysis, codes were limited to the one theme they were primarily grouped under. For example, the flood management code is under the living with water theme. Arguably, many of the codes are related to other themes within the analysis. Flood management could also be defined as water infrastructure, therefore falling under the infrastructure theme. Flood management could also be related to climate hazards because floods are a climate hazard. The climate crisis is interdisciplinary\(^{200}\); therefore, its themes will constantly relate to one another. The thematic analysis is useful in this context as it maps out and identifies relationships and patterns between themes. However, codes are not repeated to avoid redundancy\(^{201}\).

### 4.2.1. Resilience

Resilience is the ability of individuals or communities to cope with stress from hazards because of social, political, or environmental change\(^{202}\). All instances of resilience occurring in the initiatives can be divided into codes. The codes used in this analysis related to this theme are urban resilience, community resilience, infrastructure resilience, and sustainability. Anticipating future risks to plan adequately for climate


hazards is a core focus of the initiatives’ mitigation actions to achieve resilience. The Lafourche Comprehensive Resiliency Plan details this in the introduction as part of its main goal.

A primary concern of residents is the need to plan for anticipated future land loss and support coastal restoration efforts to protect the lifestyle Lafourche citizens love and value. (Lafourche Parish, Louisiana Comprehensive Resiliency Plan, 7)

While the excerpt doesn’t use the term resilience, it exemplifies a concern with resilience through residents’ concern with maintaining the ability to maintain their quality of life, which means coping with stress from hazards because of environmental change. This is effectively strengthening resilience.

Holistic climate actions achieve resilience across sectors and industries. To achieve resilience, cooperation is needed among industry sectors, government stakeholders, and community members203. Climate Action for a Resilient New Orleans highlights some fundamental actions in its plan that involve cooperation across sectors for long-term resilience.

Resilience is rooted in the knowledge that the future is uncertain, which means our actions today are critical. If we implement the actions outlined in this strategy, we will reduce our contribution to climate change, reduce our dependence on fossil fuels, reduce our waste, increase our options for active transit, increase jobs in our community from low-carbon technologies, increase our city’s competitiveness, improve our air quality, and better our overall quality of life. (Climate Action for a Resilient New Orleans, 17)

Resilience planning considers future risk, which is addressed in this quote. The adaptations and mitigations detailed in this excerpt are strategic actions to adapt to hazards and mitigate risk, enabling resiliency.

4.2.2. Climate hazards

Climate hazards are natural phenomena that pose a risk to life and the environment. Climate hazards in the initiatives can be divided into codes. Climate hazard-related codes used in this analysis are climate hazards (past), climate hazards (current), climate hazards (future), and hazards and disasters. High-frequency events, low reliance on predictability, and little time to recover between extreme events create a more drastic effect from climate hazards on Louisiana’s populations. Louisiana’s unique geography and climate put the population at risk from a combination of many climate hazards that occur relatively frequently, often at a variably high intensity. These hazards pose a current risk to Louisiana. They will continue to accelerate due to climate change conditions, exacerbating hazards, as discussed in Climate Action for a Resilient New Orleans.

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Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.
Climate change is happening now. For New Orleans, climate change is not a future scenario but a current reality. The environment of South Louisiana is changing rapidly, from our eroding coastal marshes to subsiding land in our urban neighborhoods. We are already facing many challenges caused or worsened by climate change due to our unique geography. Sea level rise and a projected increase in the intensity of weather events are expected to accelerate coastal land loss—increasing storm and surge exposure while adding greater stresses to our levee and flood protection systems. (Climate Action for a Resilient New Orleans, 9)

Climate Action for a Resilient New Orleans highlights in this excerpt that climate change is not a future issue, but a pressing current issue. Anthropogenic climate change will continue to progress, which will exacerbate climate hazards in Louisiana. Many climate hazards currently and historically have caused devastating harm in Louisiana. This excerpt encapsulates that succinctly.

Louisiana’s geography and climate put the entire state at risk of climate hazards. This has been exemplified in the past 16 years. The impact of climate hazards in the past 16 years can be seen in disaster declarations across the entire state, infrastructure damage, major floods, and intense hurricane seasons. The state of Louisiana has seen 27 major disaster declarations between 2005 and 2022. LA SAFE emphasizes

210Federal Emergency Management Agency. 2022. Declared Disasters. https://www.fema.gov/disaster/declarations?field_dv2_state_territory_tribal_value=LA&field_year_value%5B%5D=2022&field_year_value%5B%5D=2021&field_year_value%5B%5D=2020&field_year_value%5B%5D=2019&field_year_value%5B%5D=2018&field_year_value%5B%5D=2016&field_year_value%5B%5D=2015&field_year_value%5B%5D=2014&field_year_value%5B%5D=2013&field_year_value%5B%5D=
the impact of extreme events and highlights, for example, how closely the 2016 Floods occurred together\textsuperscript{211}.

Since Hurricane Katrina’s landfall in August 2005, each of Louisiana’s 64 parishes has been included in a federal major disaster declaration as a result of a named tropical event. Moreover, the Great Floods of 2016—two rainfall events six months apart affecting wide swaths of the state—caused severe flash and riverine floods and led to major disaster declarations in 56 parishes. These events have left an indelible mark on Louisiana’s history. (LA SAFE, 8)

The exposure of the entire state to a high magnitude of tropical climate hazards combined with high frequency of flooding in most of the parishes, is catastrophic. These hazards have also occurred relatively quickly, leaving little room for recovery and infrastructure change to mitigate risk and adapt to future hazards.

4.2.3. Risk

Risk is the potential exposure of an individual or community to hazard(s). The codes used in this analysis related to this theme are vulnerability, hazard and disaster risk reduction, planning, integrated strategy, and industrial hazards.

This excerpt from the Louisiana Climate Action Plan emphasizes vulnerability; particular populations’ sensitivity to risk. There are strata within this quote that implicate

exposure to different risks; social, economic, and climatic. These are all related to the climate crisis\textsuperscript{212}.

The impacts to people being felt today in Louisiana include direct physical, mental, and financial tolls from extreme weather and indirect impacts to social systems and infrastructure struggling to cope with the increasing prevalence and severity of natural disasters. As is the case globally, Louisiana’s low-income communities, communities of color, Indigenous people, and other marginalized residents are being hit especially hard because they are more likely to live in areas vulnerable to extreme weather and are typically less financially able to take on the economic challenges of recovery or relocation. These groups have been excluded from the opportunity to build wealth for generations, are more likely to live and work in overburdened communities, are more likely to live in areas with higher flood risk, and are more likely to experience insufficient or delayed investments in infrastructure and disaster recovery efforts. (Louisiana Climate Action Plan, 15)

This excerpt from the Louisiana Climate Action Plan highlights marginalized groups that are at disproportionate risk to climate hazards and effects of the climate crisis. These groups are historically marginalized and at a disadvantage to adapt and mitigate independently\textsuperscript{213}. This excerpt highlights some nuanced aspects of risk that are further detailed in multiple initiatives.


Louisiana’s geography and climate put its population at risk of many climate hazards. These climate hazards have a high impact on all aspects of life. LA SAFE highlights how fragile communities and the economy are because of the high risk of multiple climate hazards.

Louisiana’s coastal communities are vulnerable to land loss, storm surge, and sea-level rise, putting our water-dependent culture and economy at risk. (LA SAFE, 20)

This excerpt from LA SAFE’s plan concisely highlights some of the risks coastal communities are exposed to in Louisiana. This excerpt also highlights how connected the culture and economy are to water, relating to the “living with water” theme.

4.2.4. Infrastructure

Infrastructure is the physical and organizational aspects needed for the function of society. The codes used in this analysis related to this theme are urban infrastructure, planning infrastructure, housing, transportation, government, government cooperation, utilities, energy, renewable energy, and industry (chemical, material, energy).

Water infrastructure in Louisiana is costly, time-consuming to install, and resource-intensive. The current water infrastructure is the levee protection system. The levee protection system contains several diversions including drainage systems and pumping stations. It has many flaws and must be consistently assessed for damage, as informed by painful past events detailed in the excerpt below. Multiple initiatives discuss the effectiveness of wetlands as flood prevention historically and contemporarily in conjunction with the levee protection system214.

Theoretically, the protection levees, drainage canals, and pumping systems are designed to protect lives and property inside the levees from flooding. Experiences with severe hurricane events such as Hurricane Betsy in 1965 and Hurricane Katrina in 2005 demonstrated that the levee-drainage system could not effectively function under the most severe flood-generating conditions (e.g., overtopping and breaching of levees). The presence of a wetland buffer zone between developed areas and the Gulf of Mexico can offer an added measure of protection to the integrity of the levee system by dampening wave energy and tidal surges. For this reason, it is essential that a viable marsh habitat remain outside the levees and a healthy swamp-bottomland hardwood forest is preserved inside the base of the protection levees in the low-lying (near sea-level) areas. (St Bernard Parish, Louisiana Coastal Zone Management Program, 5-8)

This excerpt from the St. Bernard Parish, Louisiana Coastal Zone Management Program recognizes that levees and the current water management and flood risk prevention infrastructure system is not as effective as it seeks to be. There are historical events that prove this in horrific ways. The levee protection system in and around the Greater New Orleans area has been modified since 2005 when it historically catastrophically failed\(^\text{215}\). However, there are still weaknesses within the system\(^\text{216}\). This plan also details how wetlands are natural infrastructure. Wetlands lower flood risk and dampen storm surge. This is the rationale for Louisiana to protect and restore coastal wetlands as infrastructure.


This excerpt from Resilient New Orleans emphasizes holistically understanding geography, geology, and hydrology in infrastructure. Understanding of environmental changes must be included to plan adequately for the future and account for future risk.

We must align our infrastructure and urban environment to the realities of our delta soils and geography. Rather than resist water, we must embrace it, building on the confluence of Louisiana’s culture, history, and natural systems. As we look to the wisdom of the past, we must also prepare for the risks of the future. (Resilient New Orleans, 4 & 33)

Infrastructure must be informed by past experiences and informed by future predictions, which is discussed in Resilient New Orleans. This is related to the “living with water” theme. Infrastructure in this initiative, amongst others, falls under built water management and coastal wetlands.

4.2.5. Living with water

Living with water is a concept used in many initiatives, especially in the Greater New Orleans Urban Water Plan\textsuperscript{217}. Life in Louisiana is surrounded by and related to water at all levels. All aspects of life are inextricably linked to water. This can mean water infrastructure, the environment, and climate hazards. The codes used in this analysis related to this theme are wetland management, flood management, water management, coastal restoration, levees, and canals.

This excerpt introduces the term “live with water” in the context of understanding life and the environment in Louisiana. Understanding risk and mitigating risk must

\textsuperscript{217}Waggonner and Ball Architects reserve the term Living with Water\textsuperscript{®}. This thesis uses it freely under educational fair use, and acknowledges and thanks Waggonner and Ball Architects for their generosity in allowing the author to use the term in this text. Definition from Waggonner & Ball, wbae.com: “Living with Water\textsuperscript{®} is an approach to water-resilient urban and building design developed by Waggonner & Ball in the years since Hurricane Katrina. Living with Water begins the process of transforming water from threat to asset.”
include living with water. Because of Louisiana’s unique geography, living with water must be incorporated into climate action.

The plan provides tremendous economic development opportunities for Louisiana and its citizens. Our investment in coastal research has spurred the growth of related fields. For example, learning to live with water is central to our wetland restoration and flood risk reduction strategies. (Coastal Protection and Restoration Authority of Louisiana, ES-19 & 104)

The CPRA uses “live with water” in this context to emphasize the frequency of water-related natural hazards in Louisiana and what adaptations and mitigations are present in the Master Plan to address these. Economic development is also stressed in the context of coastal restoration and mitigation.

Resilient New Orleans highlights how holistic adaptation actions are not limited to one category. Although New Orleans is a water city, the current water infrastructure suppresses water when it could be incorporated and used by infrastructure as part of adaptation and mitigation actions²¹⁸.

Our adaptation must be both physical and behavioral. Our historical experience living with water in Southeast Louisiana has been largely forgotten. Much of our water flows behind walls and through culverts, where we rarely see it. Despite being a place that is so defined by hydrology, we have systematically hidden water from our daily experience. (Resilient New Orleans, 33)

Resilient New Orleans uses “living with water” in this context to address how water is omnipresent in life in Louisiana, and how this is managed through infrastructure. Even though water is everywhere in Louisiana, many people don’t encounter it that often. Levees are an example of this – concrete or earthen walls are literal barriers between communities and water, although levees don’t always function in

their intended manner\textsuperscript{219}. Levees have structural design limits and more importantly they all have design limits and w/ SLR those design limits will become obsolete

The adaptation and mitigation actions proposed in the Greater New Orleans Urban Water Plan propose living with water and not suppressing it. Many of the actions proposed in this plan would bring water to communities’ day-to-day interactions while preventing further hazards. Street flooding from precipitation, potentially the most frequent climate hazard in New Orleans, is addressed by actions such as permeable pavement and "living streets"\textsuperscript{220}.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{living_with_water.png}
\caption{Initiatives’ use of “living with water”}
\end{figure}


Six out of the nine initiatives analyzed in this thesis use the term “living with water” or “live with water.” As detailed in the figure, the initiatives using this phrase are at the state and local levels. The Greater New Orleans Water Plan uses this term as a primary communication tool in its planning documents. Living with water is essential to the Greater New Orleans Urban Water Plan framework. Louisiana’s geography and climate are intrinsically linked to water which is only increasing with climate change, thus applying this phrase.

4.2.6. Equity

Equity is fairness and justice for all in the social context. Equality is often misused for equity; equality provides the same for all, whereas equity recognizes that individuals and communities have different needs. The codes used in this analysis related to this theme are communication, education, access, accessibility, economic strategy, and health. Racial justice, social justice, and BIPOC issues codes were initially created and were eliminated for lack of presence overall amongst the initiatives.

This excerpt from Climate Action for a Resilient New Orleans addresses racial equity and achieves resilience amongst marginalized groups. Climate justice and racial justice tenets are inherently linked; to achieve one is to achieve the other.

Taking action on climate can help us address some of those stresses with the opportunity to alleviate poverty and unemployment while improving neighborhoods and community connections.

How we take action on climate change can also help us address racial inequity in our community.

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and support our resilience. We commit to prioritizing equity in our implementation of this strategy and will work with neighborhood leaders and community organizations to foster coordinated action from which we all can benefit. (Climate Action for a Resilient New Orleans, 17)

This plan highlights how mitigation and adaptation strategies can address climate issues and social issues. Equity and social justice are prioritized in the goal, strategy, and action formation stages. This contributes to the overall goal and theme of equity. This excerpt from the Louisiana Climate Action Plan addresses equity, health, access, economic strategy, and resilience across cultural groups. Health is an issue and code addressed in multiple initiatives, specifically at the New Orleans and state levels.

The risks posed by climate change to the people of Louisiana are high. The evidence reveals that these impacts have been worsening and will continue to increase in the future. However, addressing the root cause of climate change presents an opportunity for Louisiana to build on existing strengths and maintain competitiveness in various sectors such as energy, manufacturing, and maritime transportation in the midst of a global energy transition. Taking action to address climate change is also an opportunity to improve the health, equity, and quality of life of Louisiana residents, conserve the environment and cultural heritage, and grow and diversify the economy, while offering safe, meaningful employment for Louisiana’s workforce. (Louisiana Climate Action Plan, 1)

Equity in the context of the climate crisis is closely related to social and justice issues. Climate change is not strictly a climatic issue; it is also a racial justice and social justice issue. Specific communities, frequently historically marginalized Black, Indigenous, and People of Color majority communities, are already facing the brunt of the climate crisis in Louisiana, and this is predicted to continue in the future. This is

also true worldwide. Adaptation and mitigation strategies must include social justice and racial justice provisions. Otherwise, they are not holistically addressing climate crisis issues.

4.2.7. Human impact

Human impact is the impact humans have on the environment and the earth system, whether intentional or not. The codes used in this analysis related to human impact contribute to climate change, emissions, ozone impact, land use, and resource use.

The CPRA researches coastal management and restoration, which has many implications related to human impact. One of the primary issues in Louisiana’s coastal restoration is land loss. Extreme events have compounded anthropogenic land loss.

This complex and fragile ecosystem is disappearing at an alarming rate. Between 1932 and 2010, Louisiana’s coast lost more than 1,800 square miles of land. From 2004 through 2008 alone, more than 300 square miles of marshland were lost to Hurricanes Katrina, Rita, Gustav, and Ike. The major causes of this land loss include the effects of climate change, sea level rise, subsidence, hurricanes, storm surges, disconnection of the Mississippi River from coastal marshes, and human impacts. (Louisiana’s Comprehensive Master Plan for a Sustainable Coast, ES-2)

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Land loss is one of the primary climate hazards and risks in Louisiana\textsuperscript{228}, which is outlined in the CPRA Master Plans. Land loss is primarily anthropogenically caused\textsuperscript{229}. As detailed in this quote, human impacts are a crucial cause of land loss. Discussing land loss in Louisiana without including the role human impact has had in causing historical, present, and will continue to play in land loss is exclusive\textsuperscript{230}. Climate change also drives land loss, which is anthropogenically caused\textsuperscript{231}.

Most emissions issues discussed in the initiatives were greenhouse gas reduction issues. In the Terrebonne Comprehensive Plan, ozone emissions issues were discussed in some limited detail. Ozone emissions have historically been a significant anthropogenic atmospheric issue that has garnered worldwide attention\textsuperscript{232}.

Support efforts to reduce ozone-related emissions by 20\% by 2030.
- In conjunction with South Central Planning & Development Commission, undertake and complete a parish-wide ozone-related emissions audit.
- In conjunction with SCPDC, plan, promote and implement an Ozone Reduction Pilot Program in the parish. (Vision 2030: Terrebonne Parish, Louisiana Comprehensive Plan, 12-12)

This excerpt details one of the human impact goals from the Terrebonne Parish Comprehensive Plan to reduce ozone emissions. Ozone impact is typically a policy


\textsuperscript{229}Houck OA. 1983. Land loss in coastal Louisiana: causes, consequences, and remedies. Tulane Law Review. 58:3.

\textsuperscript{230}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.


initiative managed at the national and international level, with a precedent set by the Montreal Protocol to regulate hydrofluorocarbons and chlorofluorocarbons. However, other gases contribute to ozone depletion. This initiative is conscious of Louisiana's industrial impact on ozone depletion and is initiating mitigative action at the parish level.

4.2.8. Thematic analysis data

The thematic analysis synthesizes themes from a careful coding process of data taken from the initiative reports. This section reviews multiple patterns of the thematic analysis. I compare similarities and differences between initiatives at the parish, region, and state scale and concerning the presence and lack of themes.

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Consistent with the content analysis results, infrastructure is a major result of the thematic analysis. Regardless of temporal or regional scale, infrastructure was typically one of the most highly reported themes from the thematic analysis results.

Codes relating to equity and resilience were discussed in the data samples relatively less than in other initiatives, even though many populations are at risk in the
area the initiative works within. The coastal population of Louisiana is at risk of many climate hazards that will increase unpredictability and severity because of anthropogenic climate change\textsuperscript{235}.

The use of “living with water” and “live with water” is consistent across all geographic scales of the plans. Though the volume of use of these terms differs across initiatives, it is used consistently as a communication tool to emphasize the importance of water at all strata of life in Louisiana. Whether used in the context of water-related climate hazards, risk of water-related hazards, water in geography, access to water, or water management and flood prevention, most of the initiatives used this phrase to communicate how important water is in Louisiana.


In the context of the parish plans, Lafourche, Terrebonne, and St. Bernard Parish are all at risk of many climate hazards, as stated in 2.3. Risk is a frequently discussed theme in two of these plans. All three of these plans focus on many infrastructure mitigative and adaptive actions, both in water infrastructure and other infrastructure types. Many of the planning actions were in changing current infrastructure and implementing new systems according to climate hazards present in the parish.

Lafourche is a coastal parish, has many bayous, and a prominent port, and is at risk of many climate hazards year-round\textsuperscript{236}. Although the infrastructure mitigative and

\textsuperscript{236}Lafourche Parish Council. 2014. Lafourche Parish, Louisiana Comprehensive Resiliency Plan.
adaptive actions planned in this initiative will have a significant human impact on the environment in Lafourche, this aspect was not discussed frequently in the plan.

Like Lafourche Parish’s plan, Terrebonne Parish’s plan discusses infrastructure the most. Many of the adaptive and mitigative actions detailed in this plan adapt current infrastructure in the parish or implement new infrastructural systems to mitigate future risk. The infrastructural changes in this plan will have a significant impact on the environment in the parish; however this consequence was not discussed in the plan.

St. Bernard Parish’s plan discusses living with water and human impact the most. Similar to Lafourche and Terrebonne, many infrastructures, water management, and flood protection topics are discussed in this plan. However, many of the details in this plan focus on the human impact on the environment in St. Bernard Parish. Additional information on the context of the environment in the parish includes the environmental impact of other infrastructural projects, such as the dysfunction of the MRGO during and after the 2005 hurricane season. The MRGO led to the loss of life and property in and around St. Bernard and loss of land and saltwater intrusion.

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New Orleans is a water city with abundant water infrastructure, thus the presence of infrastructure-related codes and living with water-related codes. The plan that goes into the most detail about the current water infrastructure and potential changes and solutions to mitigate risk from flooding in New Orleans is the Greater New Orleans Water Plan. This plan focuses on re-imagining the water infrastructure of Greater New Orleans considering greater risk for hazards in the future. One of the primary goals of the plan is providing a means for all people of Greater New Orleans to survive and thrive in hazardous conditions, one of the most common hazards in the city being flooding and other water-related hazards.
The plan’s overarching goals are summarized in discussions of infrastructure, living with water, and resilience. This plan aims to re-think the infrastructure of living with water to achieve resilience. The infrastructural changes from the Greater New Orleans Water Plan are synonymous with significant human impact\textsuperscript{239}. However, the current water infrastructure is also excessively impactful on the environment of New Orleans\textsuperscript{240}. Levee construction and maintenance contribute to coastal and river degradation that is currently being remediated by costly mitigation measures of the CPRA\textsuperscript{241}.

New Orleans’ plans focus more on equity than the parish plans. The equity codes recorded in the New Orleans plans were different from the equity codes recorded in the parish plans. Equity issues in the parish plans include increasing transportation, housing, rural access to infrastructure, recreation, and financial strategy. Equity issues in the New Orleans plans mention increasing transportation and affordable housing, but focus more on accessibility issues in urban areas, health issues in urban and rural areas, and financial burden faced by marginalized groups. Codes relating to equity and resilience are typically recorded when populations and the implications of hazards or risk on populations are discussed. The parish plans did not significantly discuss any specific populations at risk. Implications of hazards were discussed, but not how those hazards would affect specific parish populations. Specific Indigenous populations and

\textsuperscript{241}Coastal Protection and Restoration Authority of Louisiana (CPRA). 2017. Louisiana’s Comprehensive Master Plan for a Sustainable Coast.
their vulnerability to various climate hazards were not named in the parish plans in detail.

Emissions are a major topic in two New Orleans plans and one of the state plans, but none of the parish plans. Emissions is a code under the human impact theme. Resilient New Orleans discusses plans for a greenhouse gas reduction plan, thus a high level of infrastructure-related codes. This initiative discusses the general risks of climate change if action is not taken in the next fifty and one hundred years toward the IPCC goals\textsuperscript{242}. There are many mitigation and adaptation actions to achieve the emissions reduction goal by the target date, but they are vague. Some of these actions are transportation transition to electric vehicles and streamlining public transportation. Funding sources are unclear for many of these actions, compounding the vagueness. Implementation accountability is missing from this plan. Climate hazards and risk were the most discussed themes and infrastructure. New Orleans is particularly at risk of many worsening aspects of the climate crisis\textsuperscript{243}.


The goal of the Louisiana Climate Action Plan is a greenhouse gas emissions reduction with industry analysis and sector targets. Infrastructure, risk, and climate hazards are the most prevalent topics discussed in this plan. These most discussed themes match Climate Action for a Resilient New Orleans, the other plan that focuses on an emissions reduction plan. The Louisiana Climate Action Plan analyzes Louisiana’s energy use and how to reduce it on a statewide scale. There are some mitigation and adaptation actions to achieve the emissions reduction goal by the target year. Many of the mitigation and adaptation actions outlined in this plan to reduce emissions are vague and without a funding source, like Resilient New Orleans and
Climate Action for a Resilient New Orleans. This plan is missing implementation accountability.

Much of the discussion of infrastructure in the Louisiana Climate Action Plan is surrounding the plan for decarbonizing Louisiana. The state-wide transition to low-carbon energy use state-wide is theorized in the plan, economic infrastructural breakdown, the industrial infrastructural breakdown, and the overall implementation infrastructure and strategy. These aspects and the actions detailed in the plan are all related to infrastructure in Louisiana, thus the high presence of the infrastructure theme.

Climate hazards are discussed in multiple sections of this plan but are not the primary focus. The adaptation and mitigation actions through decarbonizing are the primary foci of this plan. Equity and human impact are also not primarily discussed. Equity issues are also broadly addressed to say that there are marginalized groups in Louisiana that disproportionately face more harm in the face of the climate crisis and may have to move in the future. Although human impact is related to changing energy use, it was not discussed as highly as the other themes. There are many implications from Louisiana’s energy sector in the transition to a low-carbon economy that were not explicitly stated in this plan.

The Louisiana Strategic Adaptations for Future Environments (LA SAFE) Adaptation Strategies plan focuses on climate hazards and risk. The main goals of LA SAFE are to learn from climate hazards of the past, specifically Hurricane Isaac, and to adapt to future climate hazards of the future. Resilience is a main emphasized goal in

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the planning documents. The six parishes within the area of LA SAFE are at considerable risk of hurricanes and other climate hazards\(^\text{245}\). The main purpose of this plan is to fund mitigation projects in its six parishes. The research process was informed by the plan’s community-driven input process. The planning teams conducted many thorough community workshops throughout the parishes and developed projects with community members. Some projects detailed in this plan for potential and committed funding are wetland education (Jefferson), permanent resident buyouts (Terrebonne), resilient housing programming (Lafourche), complete streets programs (St. John the Baptist), and outdoor recreation (St. Tammany).

The third state-level plan, Louisiana’s Comprehensive Master Plan for a Sustainable Coast, had considerably contrasting results to the other two state plans. Infrastructure, human impact, and living with water are the most discussed themes in this plan. Much of the content in the Coastal Master Plan concerns coastal restoration, adapting to coastal risks, and mitigating future risks on the coastline, such as land loss. This involves high amounts of human impact on the coastline combined with infrastructural involvement and change, thus the high presence of both themes. Although there are many climate hazards and risks implicated in this plan, codes relating to climate hazards and risk weren’t explicitly discussed as much as codes relating to the other themes. The results show a bias towards infrastructure and development in this plan.

Chapter 5. Discussion

Many adaptive and mitigative strategies are addressed in the nine initiative reports analyzed in this thesis. Infrastructural adaptation and mitigation strategies, a major focus of the initiatives, cover urbanizing transportation in rural areas and actions to strengthen community initiatives in urban areas. The controversial implications of the Coastal Master Plan raise questions about tensions between development and coastal restoration. Creating and implementing water and flood management infrastructure adaptation and mitigation strategies allows communities to achieve resilience and lower risk exposure to climate hazards\textsuperscript{246}.

The initiatives largely exclude crucial equity issues. Many of these issues overlap with mitigative and adaptive strategies. Awareness of the climate crisis, social and racial justice issues, Black, Indigenous, and People of Color as marginalized and at-risk groups, concise definitions of climate terms, and health issues are equity issues primarily left out of these government planning documents. These issues are missing from the initiatives to ensure that Louisiana is adapting and mitigating risk in the climate crisis\textsuperscript{247}.

Adaptive and mitigative actions through greenhouse gas reduction target goals are excluded from most of the initiatives. The lack of commitment to energy and

specifically the clean energy transition in this industry is concerning for a high-emitting state like Louisiana. Energy adaptation and mitigation actions are crucial to high-emitting areas\textsuperscript{248}. Some adaptation and mitigation strategies given are not ideal for the current climate crisis conditions, and the reduction strategy plans that do exist are relatively vague and do not address anthropogenic climate change as it affects Louisiana. High emitters of carbon dioxide and other greenhouse gases, such as various members of the chemical and material industry, are not addressed as the appropriate causes of current levels of high emissions in the state.

There are many holistic adaptive and mitigative strategies outlined in the nine initiatives. Still, many specific areas like energy adaptation and equity issues need to be updated or given more attention to detail. There are multiple sectors addressed by the initiatives that reveal potential bias through their representation in the plans, like the current water infrastructure in the majority of the state (the levee protection system) and the current energy use breakdown in the state (large portion of natural gas, reliance on fossil fuels and refining oil and gas, including offshore).

5.1. Infrastructure as a major result

Infrastructure was a major result revealed in both the thematic analysis and the content analysis. Overall, infrastructure was most present in the initiatives’ thematic analyses. From the content analysis, transportation was the most reported mitigation strategy. From the thematic analysis, infrastructure was the most reported theme in multiple initiatives. Infrastructural issues were prominent in the initiatives. The local plans prioritize transportation in their adapting strategies, both at the urban and rural levels. The initiatives incorporate transportation in their adaptation and mitigation strategies in different ways because of differences in geography, population, and cultural needs. Transportation in the initiatives remains present, as shown in the analysis results.

The content analysis also revealed adaptation topics in water management and flood management. As shown in the adaptation and mitigation topics analysis, this is typically a high priority for infrastructural change at the rural and urban levels. Multiple initiatives demonstrated extractive thinking among prominent industrial concerns. This industry bias or specific industry sectors is evident in the lack of holistic adaptation and mitigation strategies\textsuperscript{249}, specifically regarding emissions reduction and coastal restoration management.

Infrastructure is a long-term investment. Infrastructure is addressed in intimate detail in these initiatives. One of the primary issues addressed in many initiatives is

water infrastructure and its current issues. Levees and flood infrastructure are time-consuming to plan and build and have shown to be ineffective when it matters most\textsuperscript{250}. This resource-intensive current state of water infrastructure is far from perfect and requires high levels of adaptation, attention, funding, and maintenance\textsuperscript{251}. The Greater New Orleans Urban Water Plan (GNOUWP) proposes an alternative water infrastructure for the Greater New Orleans area that embraces the area’s delta geography and finds cohesive ways to adapt while addressing risk without physically suppressing water. The actions and strategies outlined in the GNOUWP are costly, but so is maintaining the current levee protection system in its current state. The question poses itself – why build and sustain more levees without informed design remodel if they just won't be good enough?

Infrastructure is informed by past experiences as well as future predictions. The St. Bernard Parish CZMP highlights Hurricane Betsy and Katrina, where there were catastrophic levee and water management infrastructure failures\textsuperscript{252}. The effects are beyond devastating for Louisiana, and the recovery process is still ongoing. This plan also details that wetlands are infrastructure as well. They prevent storm surges and flood risks. This is the rationale for Louisiana to protect and restore coastal wetlands as infrastructure. Even with expert science and engineering, existing flood protection

\begin{flushright}
\textsuperscript{252}Coastal Environments, Inc. 2013. St. Bernard Parish Coastal Zone Management Program. St. Bernard Parish Government.\end{flushright}
infrastructure remains imperfect and vulnerable to certain types and volumes of extreme events\textsuperscript{253}. Considering the frequency and unpredictability of intense extreme events in Louisiana, relying so heavily on an infrastructure system with so many faults may not be the best solution for Louisiana’s future. The Greater New Orleans Urban Water Plan and the St. Bernard Parish CZMP both inform their mitigation and adaptation actions with St. Bernard Parish’s particular devastation from the 2005 hurricane season in mind.

Infrastructural changes to raise quality of life are common in urban and rural local plans. The major points of urban infrastructure to increase quality of life are typically social services and systems to address inequities present in New Orleans. Resilient New Orleans details small business support, strengthening utilities in areas that have been historically weak, and plans for post-disaster recovery\textsuperscript{254}. The major points of rural infrastructure to raising quality for life are increased public transportation, funding for development in urban centers in the rural parishes, and funding for local cultural initiatives\textsuperscript{255}. Committing to these infrastructural changes at the rural and urban levels can strengthen resilience in these communities\textsuperscript{256}.

On the rural scale, the three parish initiatives had many similar goals for developing their infrastructure. Creating more public transportation to connect rural

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\textsuperscript{254}City of New Orleans. 2015. Resilient New Orleans: Strategic actions to shape our future city.


areas, revitalizing downtown areas, creating more housing for young people and professionals, and developing state highways were common themes in the three parish initiatives. Public transportation is a weakness of the three rural parishes because there is not much concentrated urban development or concentrated populations\textsuperscript{257}. However, lack of public transportation is an issue of access and equity and addresses the isolation of vulnerable groups such as the elderly and disabled\textsuperscript{258}.

Two of the central infrastructure topics in the rural parish plans were roadwork and highway development. These topics were under the transportation theme. Further developing state highways was prioritized as an economic development strategy in the energy and chemicals industries to connect sources. State highway development also strengthens evacuation routes in the rural parishes, but that was not discussed in all parish initiatives.

The New Orleans initiatives discussed urban infrastructure frequently. Urban planning & management, one of the mitigation topics, was most reported in the two plans. Cities internationally take up roughly 3\% of the earth’s surface land area\textsuperscript{259}. Cities internationally are responsible for approximately 76\% of energy use and greenhouse gas emissions\textsuperscript{260}. Understanding the position urban areas have in global energy use

and emissions output justifies adaptation and mitigation actions for urban initiatives\textsuperscript{261}.

The New Orleans initiatives addressed the scale of local governments and the unique ability to act on a faster scale than national governments, and even larger cities’ governments\textsuperscript{262}.

The Coastal Protection and Restoration Authority as an agency maintains infrastructure responsibilities in coastal restoration across Louisiana. In acting upon the actions in CPRA Master Plan, infrastructure is maintained, and theoretically, mitigates risk. LA SAFE and Climate Action for a Resilient New Orleans both mention how even with full implementation of the 2017 CPRA Master Plan, there’s still a significant net land loss and flood risk.

“The Coastal Master Plan—a $50 billion, 50-year coastal restoration and flood risk reduction effort—is the cornerstone of Louisiana’s response. However, even with the plan’s full implementation, it is likely the state will experience a net loss of land—and be faced with the increased coastal flood risk that comes from less land—over the next 50 years.” (LA SAFE, 8)

Land loss and flood risk are significant hazards to Louisiana’s coastline. This concerns the environment and the people of the coast. All of the initiatives broadly cover economic strategy and Louisiana’s industry sectors. The coastal environment was discussed in the CPRA Master Plan with a bias towards Louisiana industry. In the thematic analysis of the CPRA 2017 Master Plan, the two most reported themes were infrastructure and human impact. This result – the combination, volume of theme being

\textsuperscript{261}Dawson R. 2011. Potential pitfalls on the transition to more sustainable cities and how they might be avoided. Carbon Management. 2(2):175–188. doi:10.4155/CMT.11.8


City of New Orleans. 2015. Resilient New Orleans: Strategic actions to shape our future city.
reported, and comparison to other themes in the analysis set – was unlike any other initiative.

However, the CPRA Master Plan discussed coastal restoration for the sake of resources needed from the coast for various economic sectors. Economic sectors, including extractive practices involved in the coast are crucial to Louisiana’s economy and cause significant damage to the coastline. There are no existing adaptation and mitigation plans to further coastal restoration that involve divesting extractive practices and industry from the Louisiana coastline to prevent coastal degradation.

The population of two million on the coastal region occupies areas of variable flood risk. Flood insurance and flood policy are controversial issues for coastal residents that can cause tremendous financial burden, and were not addressed in depth in the CPRA Master Plan. The paradox of disaster policy is the existence of policies that either prioritize safe development or economic development. Safe development, which does not put individuals or communities at any risk of concern, was not prioritized in the CPRA Master Plan.
Although the stated goal of the CPRA Master Plan is to restore the coast for the future of Louisiana, the emphasis is not on the future of the population of Louisiana. This is an example of a disaster policy paradox\textsuperscript{267}. The prioritized emphasis of the plan is on the economy, or the “Working Coast”, as Louisiana’s coast is referred to in the CPRA Master Plan. Randolph writes, “the ‘Working Coast’ attempts to signify the importance of Louisiana’s coastal zone to the nation’s economy in order to justify expensive restoration projects.”\textsuperscript{268} This logically aligns with the history of coastal research in Louisiana. The first major report from Louisiana State University on land loss in Louisiana was The Master Plan is incredibly ambitious and proposes adaptive and mitigative action to manage climate hazards with infrastructure. Randolph highlights that the extractive practices that led to massive coastal land loss are not being formally addressed.

After coding and completing the thematic analysis, I was left with the question: what is the true goal of the Master Plan for the Coast? Is it to restore the coast for the community of Louisiana? Or is the goal to restore the coast to continue to be worked for the economy of Louisiana, regardless of the effect, thus continuing degradation and destruction\textsuperscript{269}.

\textsuperscript{268}Randolph N. 2018. License to extract: How Louisiana’s Master Plan for a Sustainable Coast is sinking it. Lateral 7(2).
The planning process of the Louisiana Climate Action Plan (LACAP) allowed for the bias of many industry representatives to influence the specificity and effectiveness of its mitigation and adaptation actions. The planning process involved not just the main task force that authored the plan, but additional committees and task forces with specific subjects. These included representatives from different social and political strata of the state. Committees included many industrial representatives, as well as industry-themed committees. Some task force members dissented\(^\text{270}\) to certain thematic elements of the adaptation and mitigation actions, but it is doubtful that the dissent was accepted in the final state of the plan. The plan was clearly influenced by its industrial planners in the efficacy and thematic elements of the plan.

The Louisiana Climate Action Plan similarly applies, as Randolph puts it, extractive thinking in the review of Louisiana’s energy usage and proposal of adaptation and mitigation strategies. Industry is responsible for the majority of emissions in Louisiana\(^\text{271}\). Much of the same coast-degrading industry is responsible for this large amount of emissions. Fossil fuel extraction, including natural gas extraction, the majority of energy used in Louisiana, is highly destructive to our “Working Coast”\(^\text{272}\). Without major adaptive and mitigative measures to address these issues, coastal degradation


\(^{272}\)Randolph N. 2018. License to extract: How Louisiana’s Master Plan for a Sustainable Coast is sinking it. Lateral 7(2).

will continue amidst costly restoration efforts. The costs will be borne by the two million Louisianans residing on the coastline as their exposure to risk continues to climb.

The initiatives do not address emissions reduction and coastal restoration management holistically because of indicated bias towards certain industry sectors. The 2017 CPRA Master Plan and the Louisiana Climate Action Plan exemplify paradoxical holistically disaster policy by indicating a bias towards extractive industries in and off Louisiana’s coast\(^{273}\). The lack of holistic climate mitigation and adaptation actions negatively affects Louisianans directly, now and in the future. These initiatives prioritize extractive industry over Louisianans.

5.2. Equity issues excluded

Equity was one of the least discussed themes across the nine initiatives. A variety of issues under equity were either minimally discussed or missing entirely from the initiatives. The exclusion of these issues is problematic for climate initiatives on both local and state scales because of the holistic nature that climate mitigation and adaptation policy should aim to have. Some of these issues are awareness, education, communication, accessibility, access, health issues, social justice, BIPOC issues, and racial justice. Social justice, racial justice, and BIPOC issues codes were eliminated from the codebook for lack of presence overall amongst the initiatives.

Climate education and climate awareness are equity-related issues generally lacking from the nine initiatives. Education, communication, and accessibility codes relate to these issues. The difference between education and awareness was addressed briefly in the LA SAFE plan. This is a crucial differentiation to make in policy, as education of community members and stakeholders on climate issues is not the same as general awareness. Climate Action for a Resilient New Orleans also briefly discussed awareness of climate change at the public level.

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As opposed to a general awareness of the climate crisis, climate change education demands more energy, resources, and comprehension\textsuperscript{277}. Climate change education was not addressed in any of the initiatives. Climate change education is a necessary form of climate change mitigation, as informing individuals of aspects of the climate crisis allows them to adapt to conditions and change habits and take action in the climate crisis\textsuperscript{278}. Increased education and outreach about climate hazards, equity, and community participation in Louisiana will achieve goals surrounding resilience in the initiatives\textsuperscript{279}. This must be done in rural and urban spheres and in many forms to maintain accessibility to all community members and equity for all community members\textsuperscript{280}.

Clear and concise definitions of the principal terms used in the initiatives are not given. This issue is related to three codes under the equity theme, education, accessibility, and communication. Making terms and information accessible through communication is crucial in materials that communities access, such as these initiatives. This issue is further discussed in the \textit{Future of Energy in Louisiana} section. Many of the initiatives analyzed in this thesis contain accessible language, which a wide range of

\textsuperscript{280}Chilisa B. 2012. Indigenous research methodologies. Los Angeles, CA. [u.a.]: SAGE.
audiences can understand, but this is rendered irrelevant if the main themes and terms are not defined in their context\textsuperscript{281}. This is especially relevant because terms can have particular meanings depending on their geographical context. For instance, flood risk means something different in New Orleans than in Terrebonne Parish. Flood risk in rural areas can have a different meaning than it does in urban areas. Infrastructural definitions are critically important to these initiatives and other government planning documents.

There is ample room for error with unclear definitions of infrastructural and climate crisis-related terms. The geographies of these government planning documents constantly intersect due to overlapping risks, common sources of state and federal funding, and shared goals in adaptation and mitigation\textsuperscript{282}. The exception to this general lack of clear and concisely defined terms is the Greater New Orleans Urban Water Plan, which has a comprehensive and accessible glossary. This would be a positive model for other initiatives to use\textsuperscript{283}.

Very few initiatives addressed how Black, Indigenous, and other peoples of color in Louisiana are more at risk of climate hazards and effects of the climate crisis. As addressed in the thematic analysis, these disproportionately marginalized groups being


\textsuperscript{282}Birchall SJ, Bonnett N. 2021. Climate change adaptation policy and practice: The role of agents, institutions and systems. Cities. 108:103001.


\textsuperscript{283}The Louisiana Climate Action Plan has a glossary, but has some factual inaccuracies and is not recommended by the author as a model.
more at risk of climate hazards is an issue of equity\textsuperscript{284}. When marginalized groups and their risk to climate hazards are not addressed in any climate plan, it is exclusive to racial justice and social issues in the climate crisis\textsuperscript{285}. This is another issue of equity. The majority of the initiatives did not address racial justice or social justice. The initiatives addressed social development in social services and cultural development, but no specific social and racial justice.

In the content analysis, one of the adaptation topics was health issues. Extreme heat stress is a modifier subtopic under health issues. Both analyses coded for extreme heat issues. Extreme heat stress and urban exposure to heat as a severe risk were covered in depth in the Louisiana Climate Action Plan, Resilient New Orleans, and Climate Action for a Resilient New Orleans. In the thematic analysis, infrastructure, climate hazards, risk, and equity were selected for codes related to heat stress. Equity, in this context, is the overall theme relating to heat stress and extreme heat. New Orleans has a history of racist housing policy, leaving historically Black neighborhoods exposed to more heat stress\textsuperscript{286}.

\textsuperscript{285}Adger WN, Barnett J, Chapin III FS, Ellemor H. 2011. This must be the place: Under representation of identity and meaning in climate change decision-making. Global Environmental Politics. 11(2):1–25.
Black, Indigenous, and other peoples of color are more likely to live in high-risk areas and are more likely to be less financially able to relocate if needed. This is true in Louisiana and worldwide. In Louisiana, extreme weather forces people to relocate and this issue can become especially relevant frequently during hurricane season. Historical white supremacist societal structure in the U.S. has deterred wealth accumulation in these groups and has caused further marginalization. BIPOC communities are more likely to live in high-risk areas for flooding, be more exposed to heat stress both in urban and rural environments, and have weaker support for infrastructure and disaster recovery aid. In Louisiana, BIPOC communities are more likely to be exposed to toxic air pollution, which is linked to higher cancer rates in these communities. These issues steeped in inequity were mentioned in the Louisiana

294 Terrell KA, St. Julien G. 2021. Toxic Air Pollution is Linked to Higher Cancer Rates among Impoverished Communities in Louisiana. Environmental Law Clinic, Tulane University School of Law.
Climate Action Plan and Climate Action for a Resilient New Orleans, but none of the other initiatives.

Considering the temporal scale, social resilience and equity issues are overall more present in the planning documents published in 2015 or after. Resilience issues present in the planning documents published in 2013 and 2014 are typically within the infrastructural context of resilience. Equity issues discussing social justice and racial justice have become more relevant in literature since 2015. Resilient New Orleans, published in 2015, is part of the 100 Resilient Cities Initiative from the Rockefeller Foundation. These issues are likely to become increasingly relevant with current trends in literature.

296 City of New Orleans. 2015. Resilient New Orleans: Strategic actions to shape our future city.
5.3. Future of energy in Louisiana

The lack of cohesion across local and state initiatives regarding emissions is concerning. Parish plans did not mention energy efficiency or renewable energy, as seen in the content analysis. The New Orleans plans utilize energy in adaptation in mitigation actions and discuss energy usage in varying levels of detail. However, this is anomalous at the local initiative level. Local projects need to be addressing energy issues holistically in their adaptation and mitigation efforts in strategy and action measures. State and local initiatives need to define energy adaptation consistently.

Most state and local climate initiatives do not formally address greenhouse gas reduction. When greenhouse gas reduction is addressed, it is characterized only by carbon dioxide emissions. This is exclusive of numerous potent greenhouse gases that undoubtedly contribute to the effects of climate change in Louisiana and most certainly in the US. Methane is 25 times more potent than carbon dioxide as a greenhouse gas\textsuperscript{298} and is not addressed in any initiatives analyzed in this thesis. Water vapor accounts for roughly 60% of the greenhouse effect\textsuperscript{299} and is not formally discussed by any of the initiatives in this thesis. Water vapor is also not regulated as a greenhouse gas by the US EPA\textsuperscript{300}.


\textsuperscript{300}Water vapor is recognized as a greenhouse gas by the EPA, but regulation by the EPA is very different – this implicates legislation.
Two initiatives have formal greenhouse gas target reduction strategies, Climate Action for a Resilient New Orleans and Louisiana Climate Action Plan. Climate action for a Resilient New Orleans’ greenhouse gas target reduction strategy uses 2014 data as a baseline value. The target year is 2030. The magnitude of the reduction goal is a 50% reduction in greenhouse gases, which would be a 1.8 million metric ton reduction from the 2014 value of 3.6 million metric tons. The target sectors of this reduction strategy are waste management, transportation infrastructure, and energy use and production. This plan, as noted previously, defines greenhouse gases as carbon dioxide emissions.

The Louisiana Climate Action Plan’s greenhouse gas target reduction strategy uses 2005 data as a baseline value. The target year is 2050. The magnitude of the reduction goal is a net-zero emissions reduction; however, the emissions defined in this goal are limited to carbon emissions. The baseline value from 2005 is 215 million metric tons. The target sectors in this plan are coal and petroleum refining, natural gas processing, chemical manufacturing, commercial, and electric power.

Arguably, the definition given in the glossary of the Louisiana Climate Action Plan for “clean energy” is inaccurate. “Clean energy” is defined as:

“Energy generated from non-renewable sources with little to zero GHGs, includes but is not limited to nuclear, biowaste, and natural gas with carbon capture” (Louisiana Climate Action Plan, 131)

Clean energy is typically defined as renewable energy, which is precisely what this definition says it is not. This definition highlights energy use and product types that
produce lower emissions than coal, which produces very high emissions\textsuperscript{301}. These energy sources still produce emissions and are not “clean” on the scale of emissions sources\textsuperscript{302}.

The Louisiana Climate Action Plan details advancing low-carbon “alternatives” in its emissions reduction actions. This is reductive as “low-carbon alternatives” in this context include blue hydrogen. Blue hydrogen is hydrogen produced by natural gas and stored by carbon capture\textsuperscript{303}. Blue hydrogen would increase Louisiana’s greenhouse gas emissions, as reported by the Climate Initiatives Task Force meeting on 10/26/2021\textsuperscript{304}. Blue hydrogen, often falsely labeled as “clean” or an “alternative,” has been proven to produce more greenhouse gas emissions than coal\textsuperscript{305}.

The Louisiana Climate Action Plan also details several actions on carbon capture. Carbon capture storage and sequestration as a clean practice is largely unproven\textsuperscript{306}. Carbon capture storage (CCS) is likely a valuable solution for many industrial emissions; however, it is currently not cost-effective\textsuperscript{307}. CCS proposals in

Louisiana often involve either existing or proposed pipelines, which are highly destructive and harmful to marginalized communities\(^\text{308}\).

CNG, or compressed natural gas, is defined in the Terrebonne Parish plan as alternative energy with longevity in the future of Louisiana\(^\text{309}\), but it’s not renewable. Natural gas is a finite source extracted from deep underground that does not renew itself\(^\text{310}\). In the extraction process, there are also natech hazards\(^\text{311}\). Governor Edwards has spoken frequently about natural gas being the “future of Louisiana,” especially at the 2021 COP conference in Scotland\(^\text{312}\). Natural gas, blue hydrogen, and other suggested “alternative energies” are not realistic choices if the initiatives’ goals are met in the proposed timelines. Natural gas is currently the majority of energy used in Louisiana, and proportionately to other states; we are a relatively high emitter\(^\text{313}\).

To put this into the local parish initiative context, the Terrebonne Parish plan sought to “make parish…operations more sustainable” and “support efforts to ensure all parish…operations are models of resource and energy efficiency”\(^\text{314}\) and defines that


partially by pursuing the use of compressed natural gas in parish owned vehicles. This is marginally better than coal, but it is not clean or renewable energy\textsuperscript{315}.

Initiatives can be focused on energy and infrastructural issues to achieve well-rounded climate plans for such a high emitting state. This is an example of addressing a long-term issue versus a short-term issue. Adapting energy infrastructure to renewable energy mitigates further risk in the climate crisis because greenhouse gas emissions are ameliorated.

Furthermore, in Louisiana, where oil and gas are a major industry sector, transitioning to renewable energy can mitigate many natech and technological hazards. These hazards include drilling-induced subsidence, sinkholes, oil spills, and pollution-caused disease\textsuperscript{316}.

Transitioning to renewable energy options needs to be done to meet the goals named in the Louisiana Climate Action Plan\textsuperscript{317} and Climate Action for a Resilient New Orleans\textsuperscript{318}. However, little has been done to date to commit to any transition in Louisiana’s energy sector, especially in industrial energy, Louisiana’s biggest emitter by a wide margin\textsuperscript{319}. It is noted that decarbonizing the oil industry is a major industry

\begin{thebibliography}{99}
\bibitem{terrell2021}Terrell KA, St. Julien G. 2021. Toxic Air Pollution is Linked to Higher Cancer Rates among Impoverished Communities in Louisiana. Environmental Law Clinic, Tulane University School of Law.
\end{thebibliography}
challenge\textsuperscript{320}. Decarbonizing the oil and natural gas industries is likely a detriment to the emissions reduction goal timelines in the Louisiana Climate Action Plan and Climate Action for a Resilient New Orleans. The lack of renewable energy options in the Louisiana Climate Action Plan and Climate Action for a Resilient New Orleans will certainly challenge the emissions reduction goal timelines.

\footnotesize\textsuperscript{320}Wood M. 2021. Oil refining’s four big challenges: profitability, rationalization, decarbonization and EVs. https://www.woodmac.com/news/the-edge/oil-refining-four-big-challenges/
Chapter 6. Conclusion

Short-term climate issues often take priority in the plans over long-term issues. Current climate issues like hurricanes pose an immediate risk to a given population. Issues that don’t pose an immediate risk, such as subsidence or sea-level rise that takes place over time\textsuperscript{321} are not immediate concerns in the plans. Pollution-induced disease is another hazard, although technological, that happens over time and can be challenging to address by finding cause and correlation over time. However, many current water-related issues are present and pose immediate hazards – those are frequently addressed in the parish plans. Taking action happens faster when the effect of the climate crisis can be seen directly and is tangible. Quick policy change is more likely to come from those. This is true at the parish, urban, and state levels.

The nine initiatives predominantly address short-term climate issues with more adaptation and mitigation actions than long-term climate issues. Less tangible climate issues like emissions reduction and energy transition overall receive less discussion in the planning documents. These issues pose fewer immediate risks and thus provide less justification for immediate policy adjustments in government planning documents. I offer future recommendations in this section to provide a more holistic understanding of climate crisis processes in Louisiana and how various communities can best achieve mitigative and adaptive actions.

Climate change is often considered far-off or intangible. Although much of the climate crisis occurs in the long term and is difficult to perceive with the naked eye,

there are effects of the climate crisis constantly occurring. This difficulty in perception and lack of tangibility makes addressing climate crisis issues challenging on many scales, including government planning documents like these initiatives. The lack of a timeline for implementation in many initiatives is concerning, especially to citizens who are at risk of the described climate hazards.

Lack of accountability for government bodies is a chronic problem in the U.S. that can be applied in this case. Accountability is applied to citizens, but who keeps the government accountable? Who do you call when the government isn’t following through and doing their job?

Implementation accountability is complex to identify because of the accountable (or lack thereof) parties outlined in each initiative. There weren’t clearly outlined responsible parties outlined in the initiatives in many cases. For example, in both Resilient New Orleans and Climate Action for a Resilient New Orleans, the lead agency for many of the core actions within the plan is simply “the City of New Orleans". Following up on implementing a single project or action is not possible when the lead responsible agent is the entire city and not a specific department or individual government body. To implement the projects on their timelines, the implementing parties need to be held accountable. Asking how government bodies are held accountable is an essential question in this process.

Transparent implementation accountability and project completion timelines fall under the definition of comprehensive mitigation and adaptation actions. These two issues are linked, and when they do not operate in conjunction with one another, signal weakness in the given project. This is a clear weakness in many utilized climate mitigation and adaptation strategies outlined in the plans.

Useful future work related to this research would be to analyze the implementation of the actions and initiatives discussed in the planning documents analyzed in this thesis. Analyzing implementation of the actions and initiatives in the planning documents will give insight to efficacy of the plans. Comparing implementation and efficacy across multiple geographic scales as done in this thesis is a potential viable research avenue. Analyzing implementation will likely take place over longer periods of time due to the stages that project implementation takes.

An additional future valuable avenue of research and work is expanding the multiscalar analysis to the federal level, as well as other states. The United States has federal climate adaptation plans\(^{323}\) that can be analyzed in comparison with state and local climate adaptation and mitigation plans. Other states have a myriad of climate adaptation plans that can also be added to the multiscalar analysis.

This study is limited in its analyses. Questions are left unanswered concerning the implementation of the nine plans. These analyses can inform work investigating implementation in their design and focus, thus the suggestion to future work related to this research investigating implementation of these plans. However this study is limited,

it is useful in how it can inform future studies and be useful to many government, independent, community, and academic parties.

State departments, non-profits, and other organizations can use this thesis in Louisiana as a reference. Groups creating future climate planning documents should find this resource particularly useful. Understanding which themes are most discussed in each program is indicative of planning and adaptation emphasis and potential bias. The volume of infrastructure planning in the three parish plans indicates a bias toward extractive industry. The parish plans show this bias by prioritizing infrastructural adaptation and mitigation actions in partnership with extractive industry, such as expanding LA Highway 1 to and from Port Fourchon. This particular project has infrastructural impact both in Louisiana and in the rest of the country, indicating another stratum of difficulty in divestment from fossil fuels.

In the Louisiana Climate Action Plan, the discussion of the breakdown of energy usage in Louisiana without comprehensively addressing adaptations to industry indicates a bias towards extractive industry. In the Louisiana Climate Action Plan, this bias is shown in the lack of addressing extractive industry in the greenhouse gas reduction plan. The bias towards extractive industry and extractive thinking in these initiatives shows an overall trend of short-term issues. As long as extractive industry remains a major player in Louisiana, long-term climate issues will continue to pose a risk. Extractive thinking in Louisiana prevents comprehensive, mitigative problem solving of long-term climate issues.

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Climate-related initiatives in Louisiana address numerous climate hazards, but not for the long term. These initiatives provide adaptation and mitigation actions that address the short term and leave gaps for long-term issues unaddressed. If Louisiana seeks to comprehensively adapt to climate crisis conditions in the future and mitigate risk significantly, extractive practices and types of energy use must change.

Currently, extractive practices have not been addressed adequately for adaptation or mitigation in any government planning document in any legitimate way. Transitioning from extractive industries in all sectors is possible, if difficult. It must be done to meet the emissions reduction goals of these plans and for the overall well-being of the environment and people of Louisiana. The coastal resources of Louisiana have been extracted beyond the maximum, and they are still being tapped. Multiple initiatives analyzed in this thesis exemplify prioritizing extractive industry over Louisianans, both now and in the future.

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325 Terrell KA, St. Julien G. 2021. Toxic Air Pollution is Linked to Higher Cancer Rates among Impoverished Communities in Louisiana. Environmental Law Clinic, Tulane University School of Law.
APPENDIX A. Thematic analysis codebook

Figures 5.1, 5.2 Codebook
### APPENDIX B. Content analysis figures

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<th>Mitigation Topics</th>
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<th>Lafourche</th>
<th>RESNOLA</th>
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Figure 6. Mitigation topics content analysis. Acronyms are defined in Appendix C.

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Figure 7. Adaptation topics content analysis. Acronyms are defined in Appendix C.
APPENDIX C. Glossary

The glossary defines acronyms and other frequently used terms.

**Living with water**: Waggonner & Ball Architects reserve this term. This thesis uses this term freely under educational fair use. From Waggonner & Ball (wbae.com):

*Living with Water®* is an approach to water-resilient urban and building design developed by Waggonner & Ball in the years since Hurricane Katrina. Living with Water begins the process of transforming water from *threat to asset*.

**CPRA**: Coastal Protection and Restoration Authority, government branch of Louisiana state government

**LASAFE**: Louisiana Strategic Adaptations for Future Environments

**RESNOLA**: Resilient New Orleans

**CA4RESNOLA**: Climate Action for a Resilient New Orleans

**LACAP**: Louisiana Climate Action Plan

**GNOUWP**: Greater New Orleans Urban Water Plan

**CZMP**: Coastal Zone Management Plan (St. Bernard Parish)

**Natech hazard**: a combination natural–technological hazard. Example: oil spill.
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Vita

Jessie Fay Parrott is an interdisciplinary climate change specialist with a passion for communicating important climate issues to people who need to know about them. Jessie Fay was born to Rebecca Plattus and James Parrott in New York City. She has one older brother, Nathaniel. Jessie Fay grew up in Park Slope, Brooklyn. She attended Fiorello H. LaGuardia High School for Music, Art, and Performing Arts for two years and dropped out in 2016 to attend her college, Bard College at Simon’s Rock.

At Simon’s Rock, Jessie Fay was mentored by her academic advisor, Dr. Tom Coote. Jessie Fay received her Associate of Arts in May, 2018. For her undergraduate senior thesis, she developed a one-semester interdisciplinary climate crisis curriculum for middle and high school students. In May 2020, Jessie Fay received her Bachelor of Arts, magna cum laude, with a double major in Environmental and Sustainability Studies and Anthropocene Management and a minor in Botany.

At the enthusiastic recommendation of her Simon’s Rock professor and thesis committee member, Dr. Chris Coggins, she started her master’s in Geography at LSU.

At LSU, she is most proud of this thesis. Additionally, she is proud of her advocacy for graduate student rights in the student senate, working with Louisiana state legislators to create legislation to eradicate graduate student fees, advocacy for Title IX transparency in all sectors of the university, and writing an essay to nominate her close friend Miles McLendon for the undergraduate of the year Love Purple Live Gold Award (2022), which he won. She will receive her Master’s in August, 2022.