



ASSESSING TEMPORAL AND SPATIAL VARIABILITY IN COMMUNITY AND PARISH LEVEL RESPONSES TO OIL SPILLS AND OTHER EVENTS IN COASTAL LOUISIANA

Bureau of Ocean Energy Management
Information Transfer Meeting
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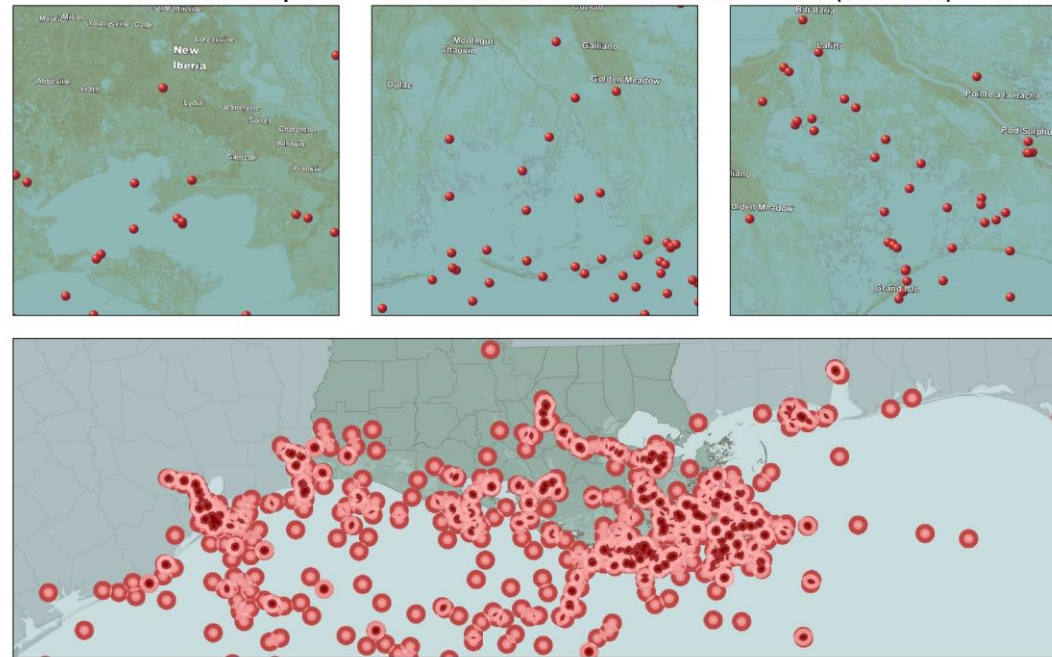


ASSESSING TEMPORAL AND SPATIAL VARIABILITY IN COMMUNITY AND PARISH-LEVEL RESPONSES TO OIL SPILLS AND OTHER EVENTS IN COASTAL LOUISIANA

Research Questions

- What are the overall shifts in demographic and social conditions in coastal areas between 1950 and 2015, and what are the major historical events or transformations that have impacted coastal communities during this time period?
- How do current residents of coastal communities understand the drivers of historical and contemporary demographic and social change in their towns and cities and, in particular, the role of oil and gas development?
- To what extent do people correlate demographic and social change with oil related events or, if not, other environmental or economic events at the local, regional, or national level?

Historical Oil Spills in Coastal Louisiana and Selected Communities (1970-2014)



Data Source: U.S. Coast Guard, National Response Center



Year 1

- Literature Review
- Mapping and Quantification of Change
- Integrate Data
- Begin Qualitative Data Assessment

Year 2

- Quantitative Modeling of Community Response
- Fieldwork

Year 3

- Integration of Quantitative and Qualitative Data
- Technical Report
- Educational Materials

ASSESSING TEMPORAL AND SPATIAL VARIABILITY IN COMMUNITY AND PARISH-LEVEL RESPONSES TO OIL SPILLS AND OTHER EVENTS IN COASTAL LOUISIANA

PRESENTATION OUTLINE

Trends in oil and gas development
1950's to 2010's

Trends in socioeconomic variables
1950's to 2010's

Trends in historical environmental change
1950's to 2010's

Trends in economic wellbeing
1950's to 2010's

Linkages and next phase



ASSESSMENT OF HISTORICAL CHANGE

- Community Vulnerability
 - ◆ Demographics
 - ◆ Social Variables
 - ◆ Housing Conditions
 - ◆ Economic Conditions
 - ◆ Access and Communications
 - ◆ Community Health and Well-Being



ASSESSMENT OF HISTORICAL CHANGE

- Stresses and Shocks
 - ◆ Extreme Weather Events
 - ◆ Economic Conditions
 - ◆ Coastal Land Loss
 - ◆ Drought
 - ◆ River Flooding
 - ◆ Legal and Societal Changes



ASSESSMENT OF HISTORICAL CHANGE

- Community Responses
- ◆ Population Change
- ◆ Economic Conditions
- ◆ Housing Conditions
- ◆ Crime
- ◆ Health Impacts



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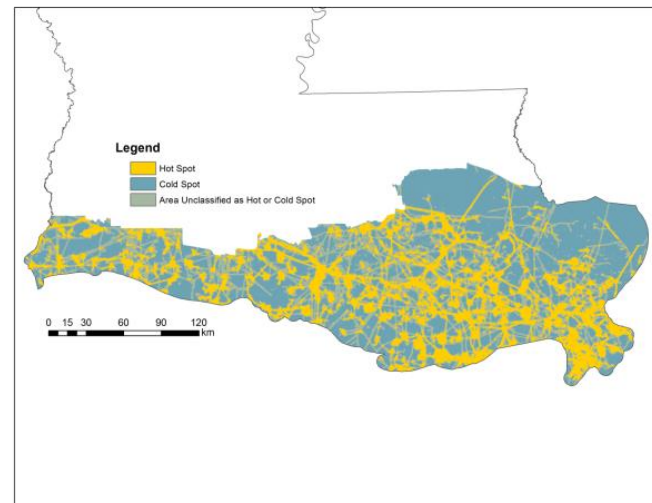
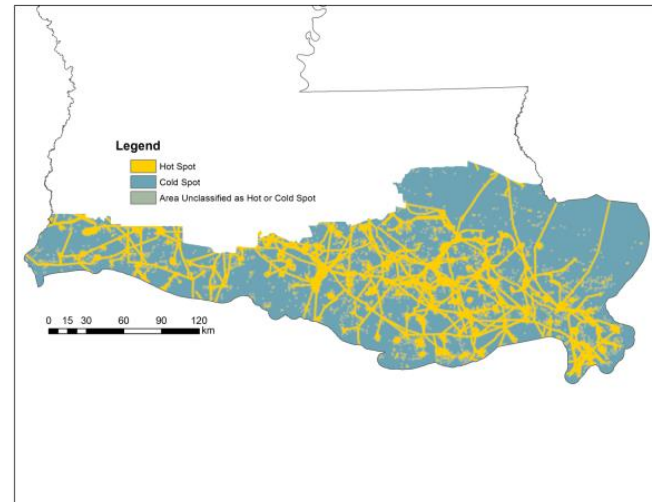
MAPPING OIL AND GAS EXPANSION

- **Facility Weighting Procedures**
 - We analyzed total statewide TRI releases over a 5-year span determined the mean frequency of release for each class of chemical for all relevant SIC Codes
 - Where the total number of releases was greater than the overall mean for a specific SIC code, we included that chemical in the data set
 - The U.S. EPA Risk-Screening Environmental Indicators (RSEI) Model provided chemical-specific hazard scores

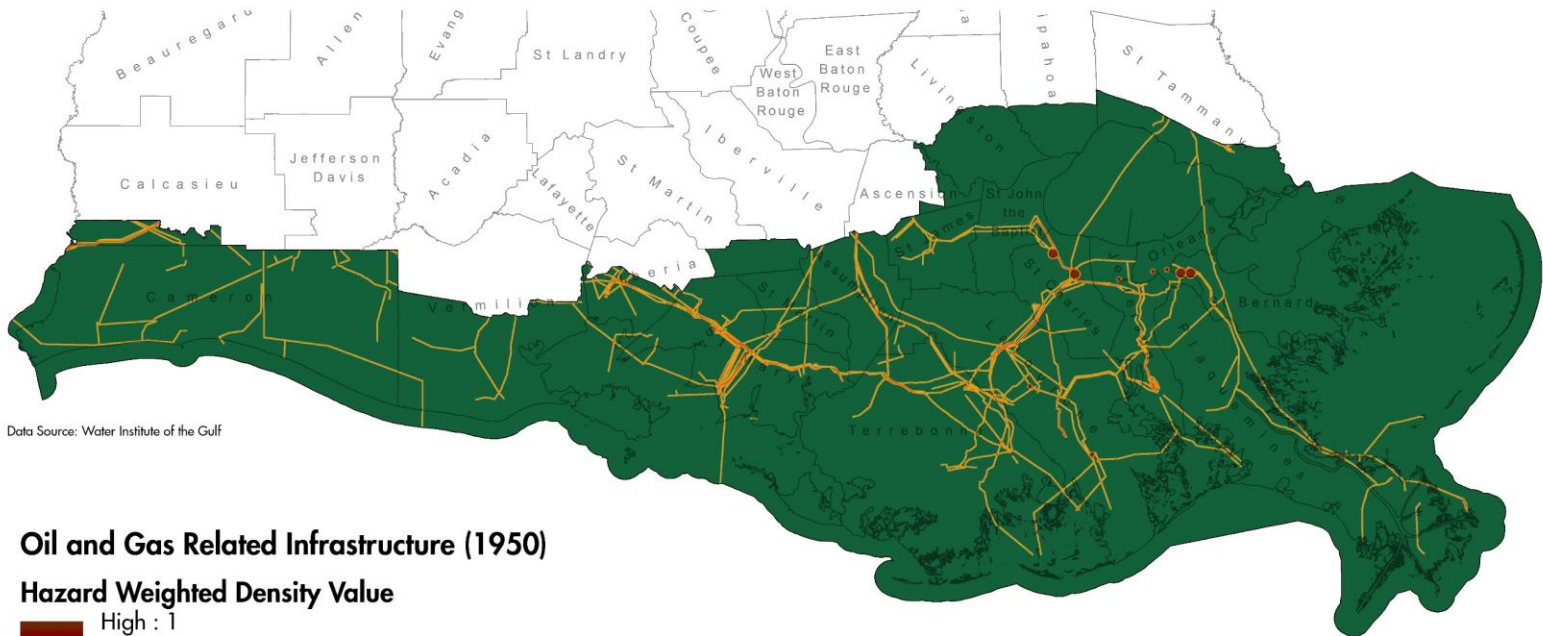
Chemical	Total Pounds	Years	Number of Facilities	Average Annual Release per Facility
Hydrogen cyanide	9,713,228	5	19	102,244.51
n-Hexane	3,397,440	5	19	35,762.53
Toluene	2,127,658	5	19	22,396.40
Xylene (mixed isomers)	1,989,240	5	19	20,939.37
Propylene	1,702,429	5	19	17,920.31
Benzene	1,163,562	5	19	12,248.02
Carbonyl sulfide	659,925	5	19	6,946.58
Ethylene	612,056	5	19	6,442.69
Methanol	480,587	5	19	5,058.81
Ethylbenzene	479,101	5	19	5,043.17
Methyl isobutyl ketone	287,934	5	19	3,030.88
Zinc compounds	246,657	5	19	2,596.39
Cyclohexane	212,990	5	19	2,242.00
Cobalt compounds	117,474	5	19	1,236.57
Carbon disulfide	108,439	5	19	1,141.46
Cumene	66,355	5	19	698.47
1,3-Butadiene	62,001	5	19	652.64
Methyl tert-butyl ether	43,929	5	19	462.41
Styrene	32,261	5	19	339.59
Manganese compounds	29,144	5	19	306.78
Acetaldehyde	26,119	5	19	274.94
Manganese	18,449	5	19	194.20
Isoprene	17,998	5	19	189.45
n-Butyl alcohol	2,700	5	19	28.42
Chromium	1,573	5	19	16.56
Chromium compounds	1,533	5	19	16.14
sec-Butyl alcohol	435	5	19	4.58
Acetonitrile	218	5	19	2.29
tert-Butyl alcohol	0	5	19	0.00
Chlorine dioxide	0	5	19	0.00
Hydrazine	0	5	19	0.00

MAPPING OIL AND GAS EXPANSION

- We created **proximity-based buffers** that are dependent on the specific hazard associated with each activity.
- Worst-case release scenario and offsite consequence analysis was performed to determine the **endpoint distance of a hypothetical release**.
- U.S. Department of Transportation guidelines establish **default isolation zones** for hazardous releases that were used to create site specific buffers around facilities with fugitive release that may not be modeled in RMP*Comp.



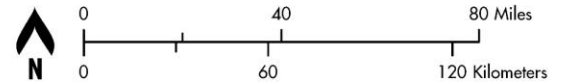
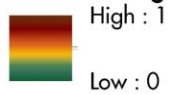
Historical Change in Oil and Gas Related Infrastructure



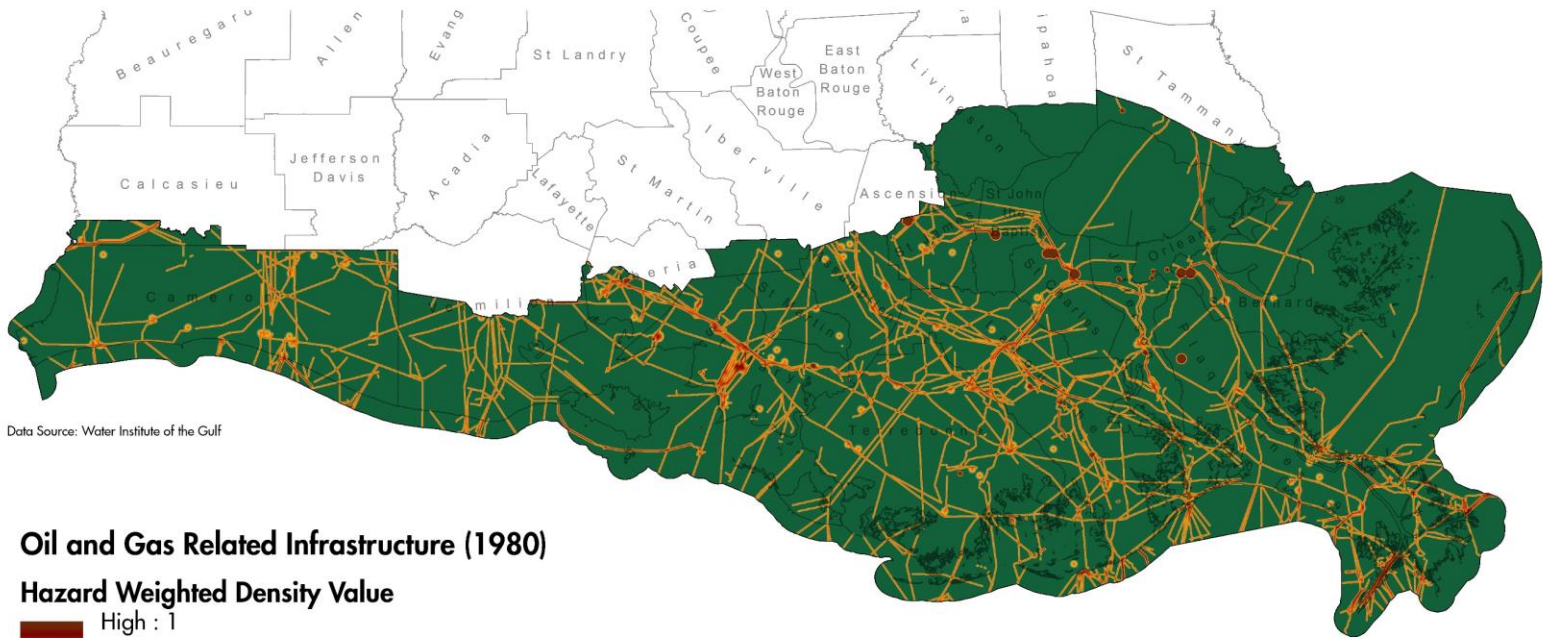
Data Source: Water Institute of the Gulf

Oil and Gas Related Infrastructure (1950)

Hazard Weighted Density Value



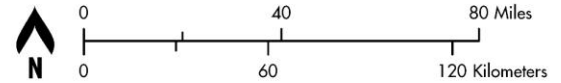
Historical Change in Oil and Gas Related Infrastructure



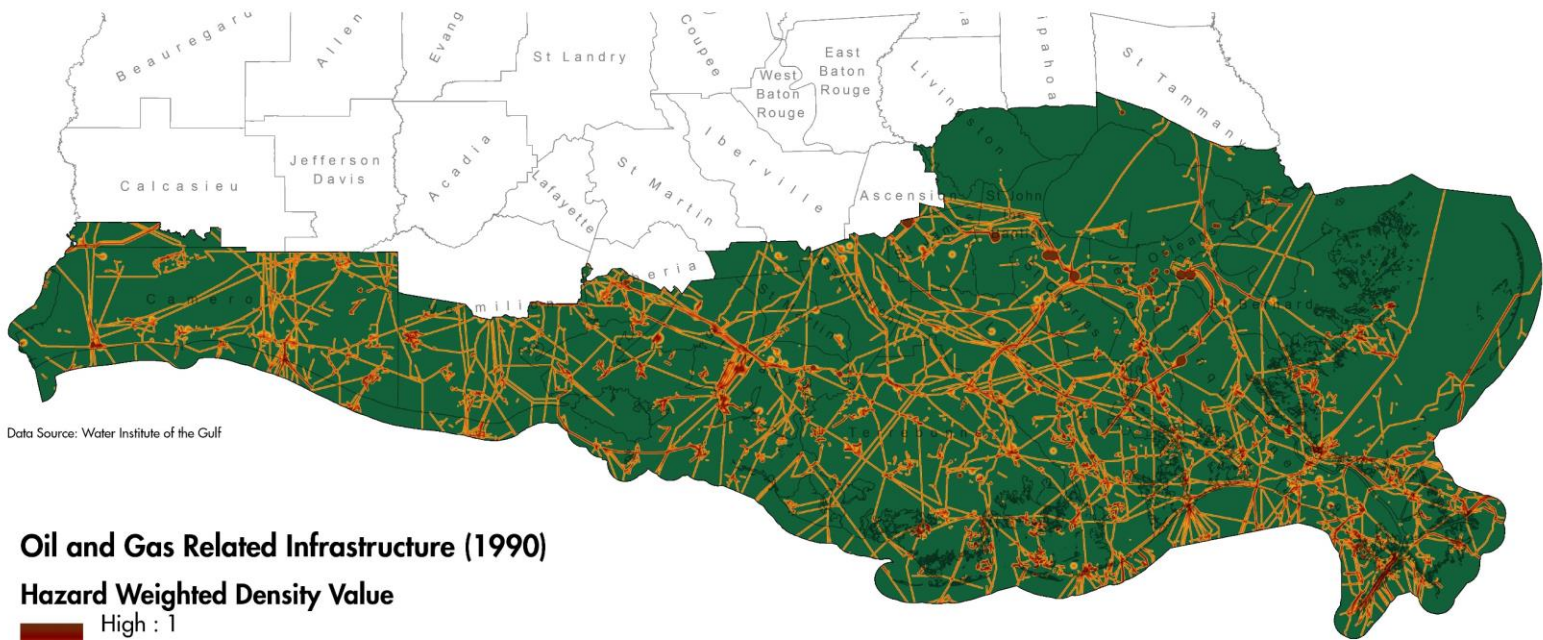
Data Source: Water Institute of the Gulf

Oil and Gas Related Infrastructure (1980)

Hazard Weighted Density Value



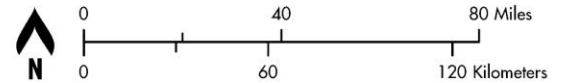
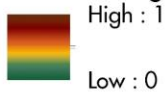
Historical Change in Oil and Gas Related Infrastructure



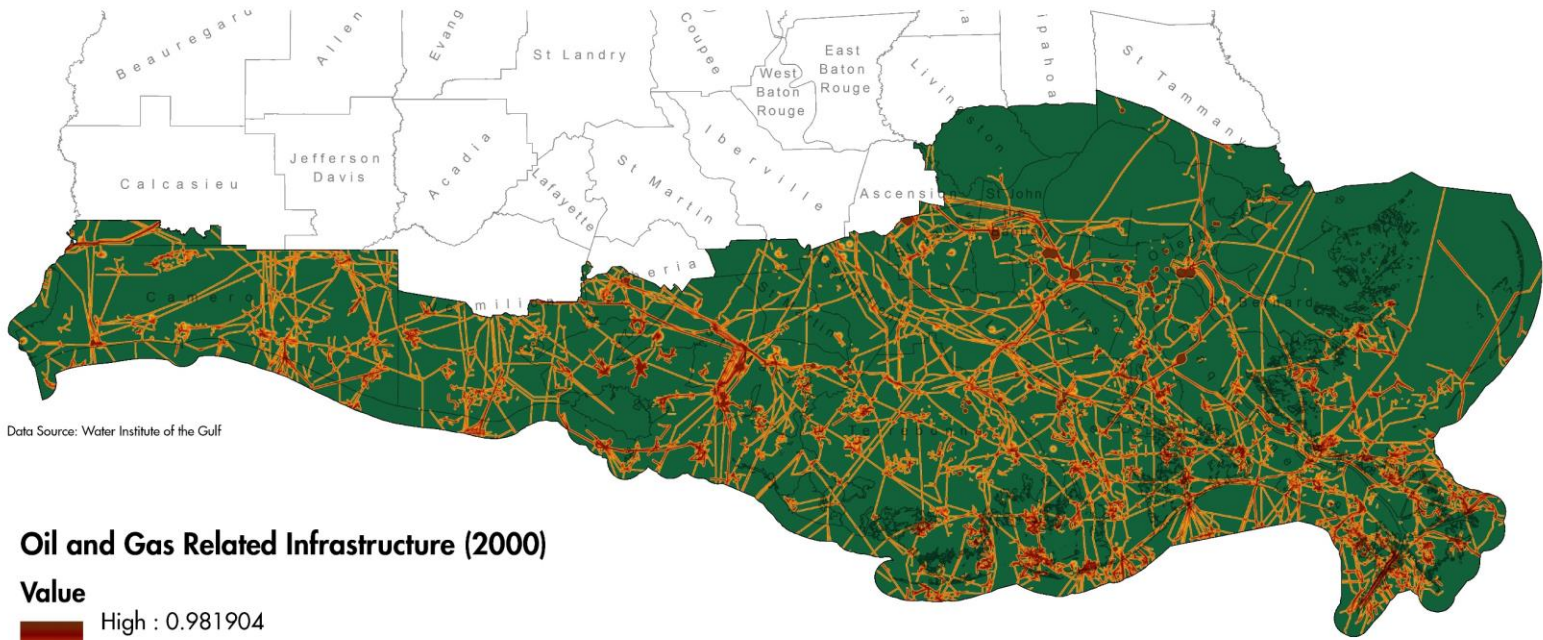
Data Source: Water Institute of the Gulf

Oil and Gas Related Infrastructure (1990)

Hazard Weighted Density Value



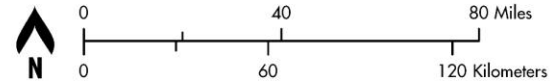
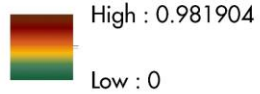
Historical Change in Oil and Gas Related Infrastructure



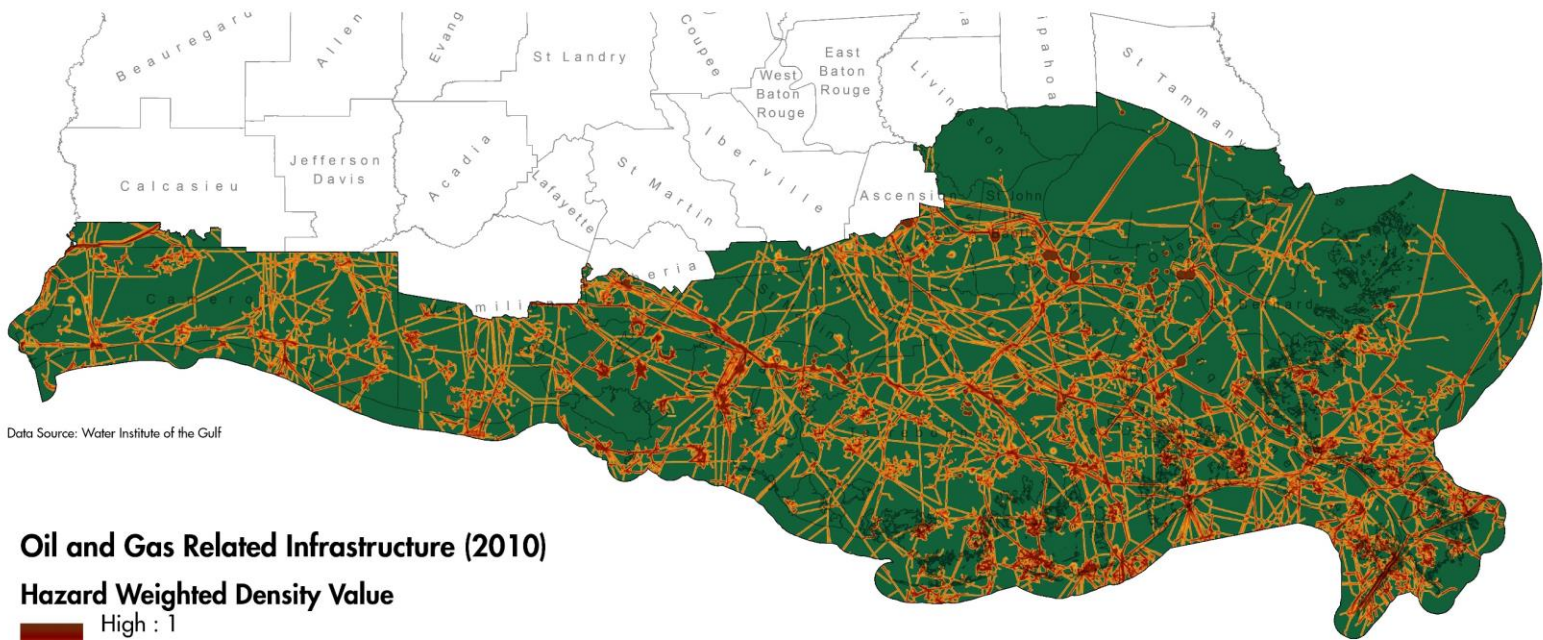
Data Source: Water Institute of the Gulf

Oil and Gas Related Infrastructure (2000)

Value



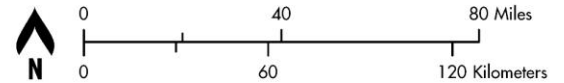
Historical Change in Oil and Gas Related Infrastructure



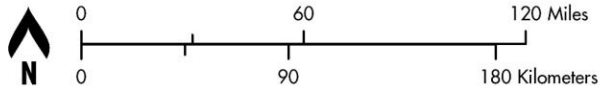
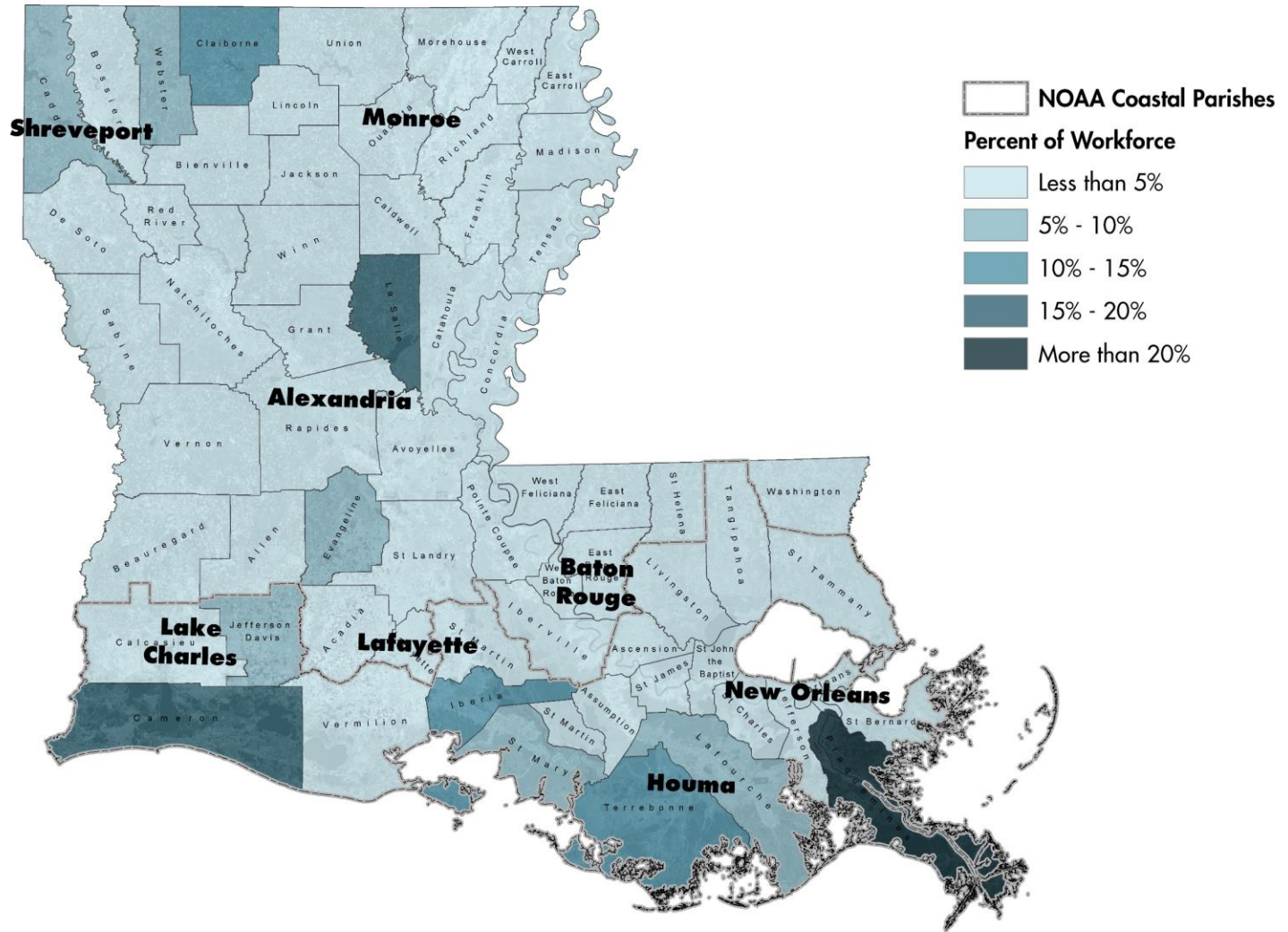
Data Source: Water Institute of the Gulf

Oil and Gas Related Infrastructure (2010)

Hazard Weighted Density Value

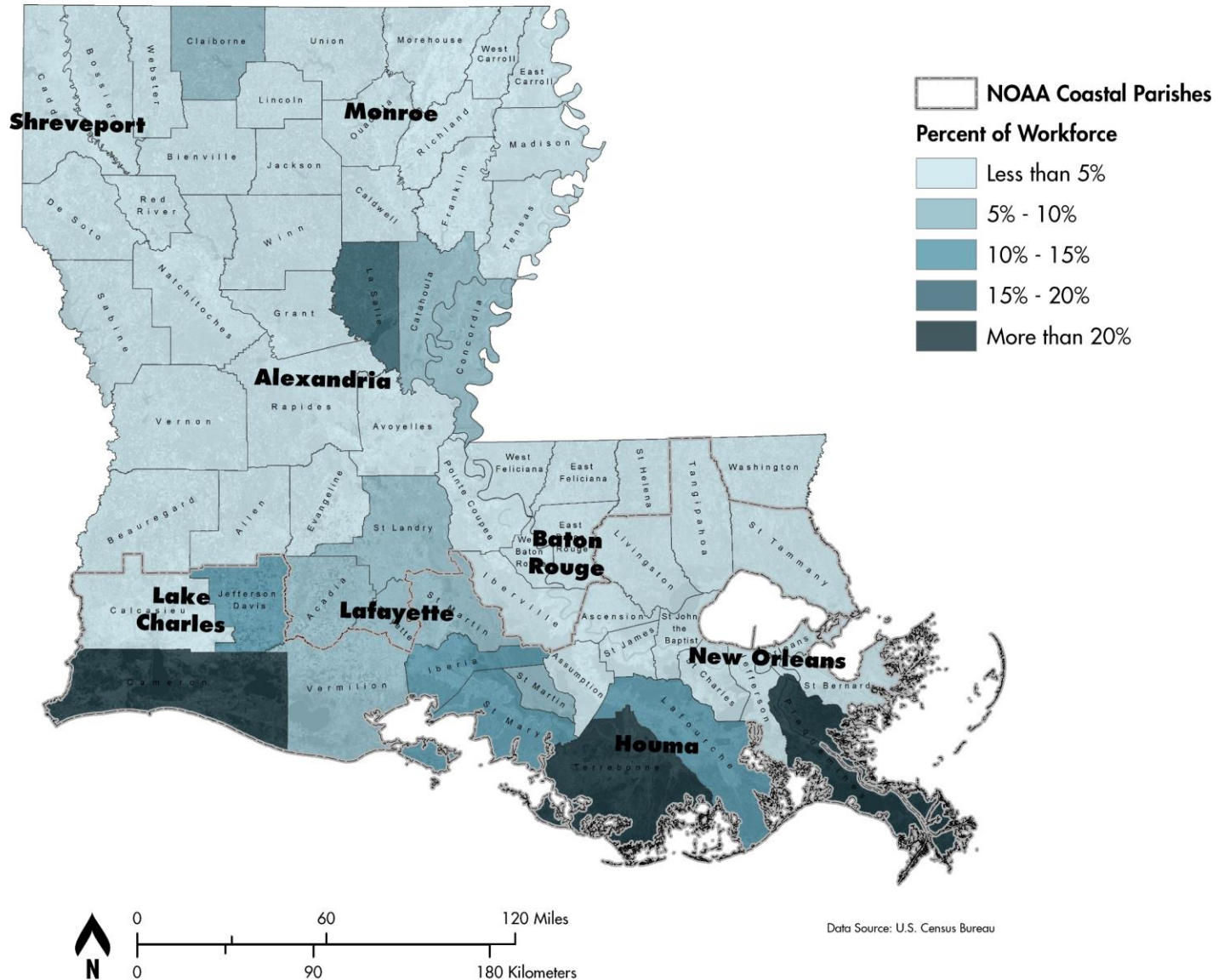


Percent of the Workforce Employed in Oil and Gas (1950)

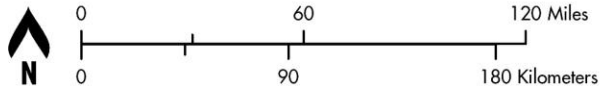
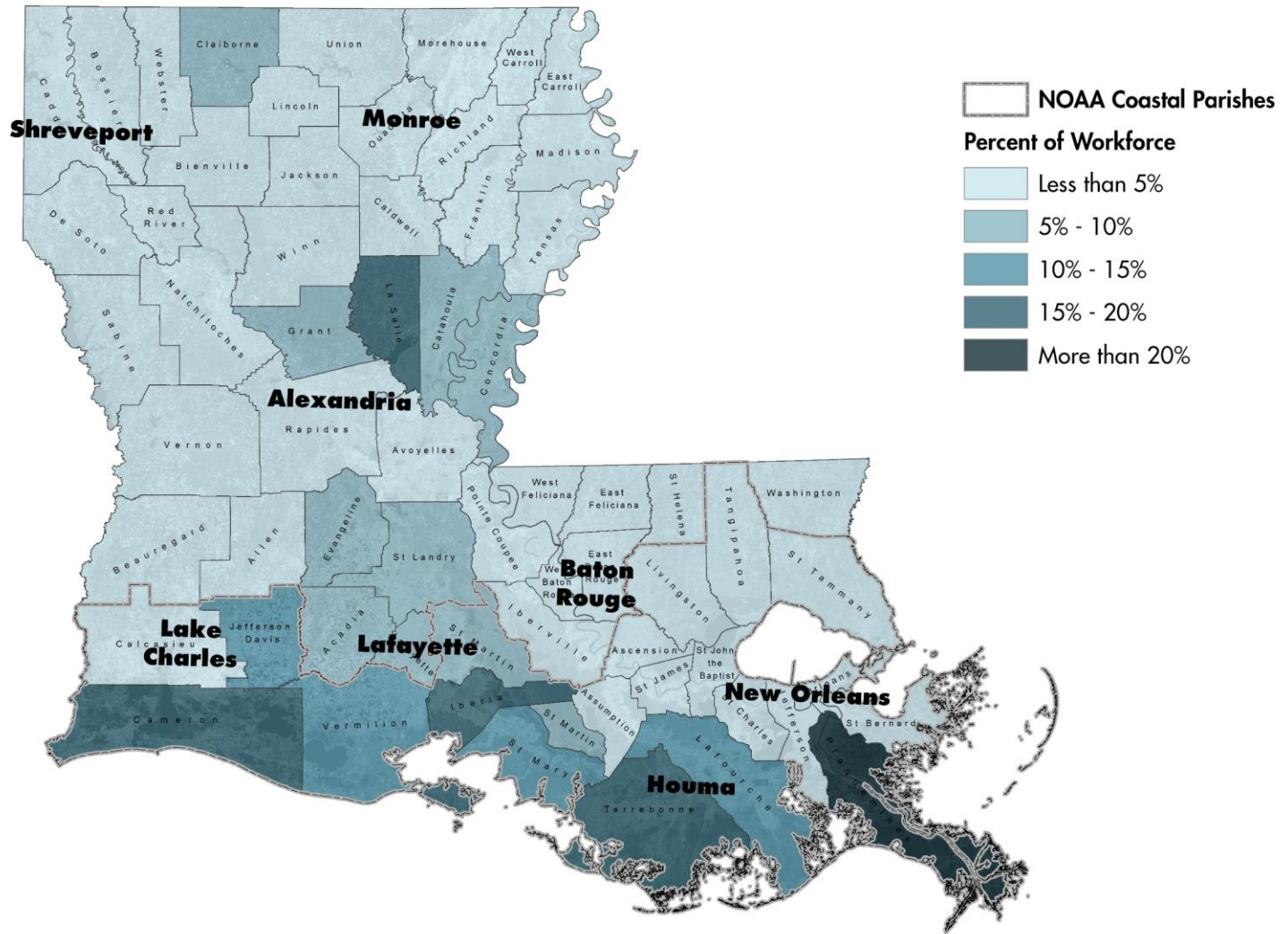


Data Source: U.S. Census Bureau

Percent of the Workforce Employed in Oil and Gas (1960)

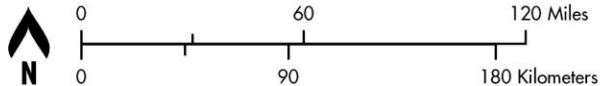
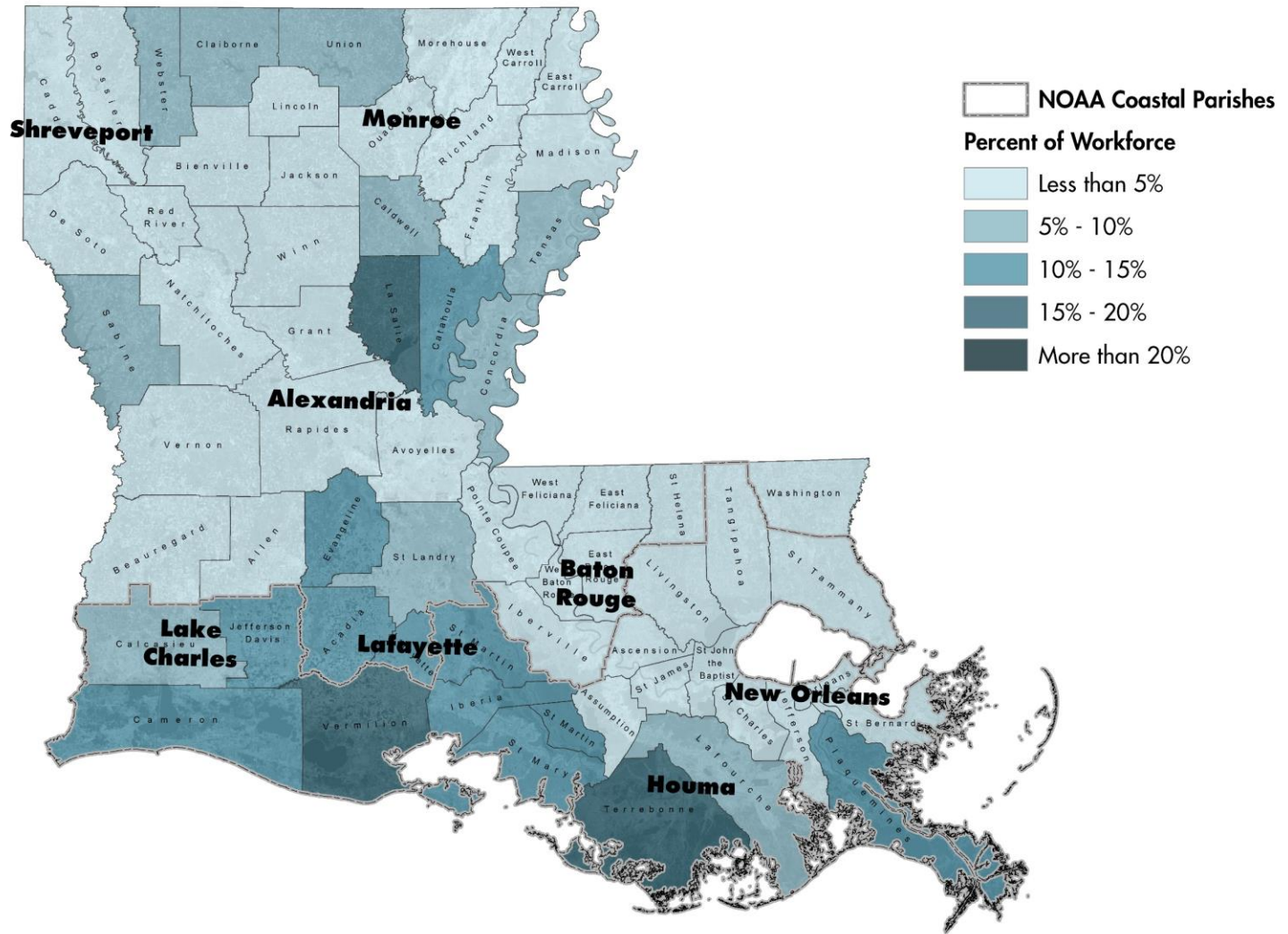


Percent of the Workforce Employed in Oil and Gas (1970)



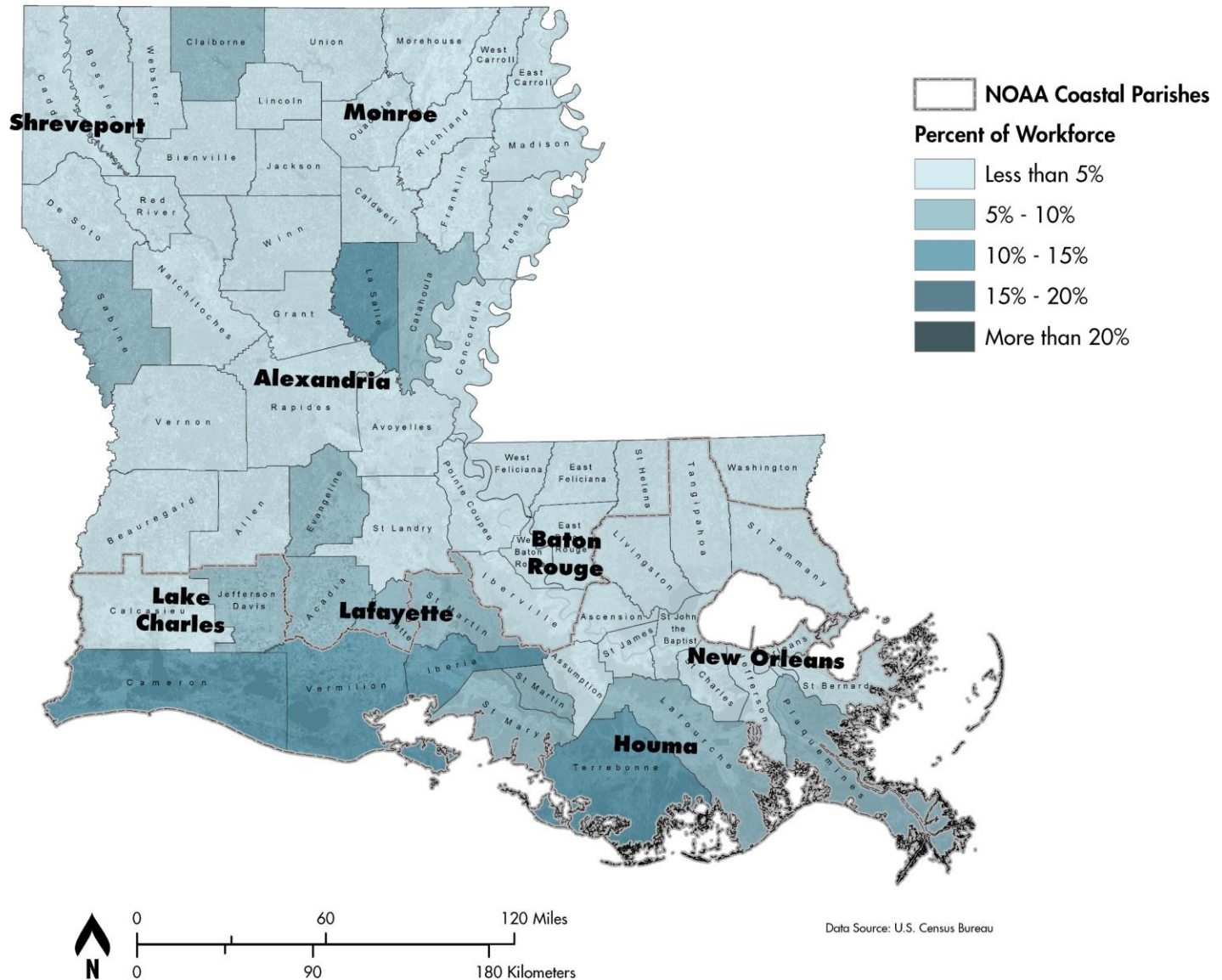
Data Source: U.S. Census Bureau

Percent of the Workforce Employed in Oil and Gas (1990)

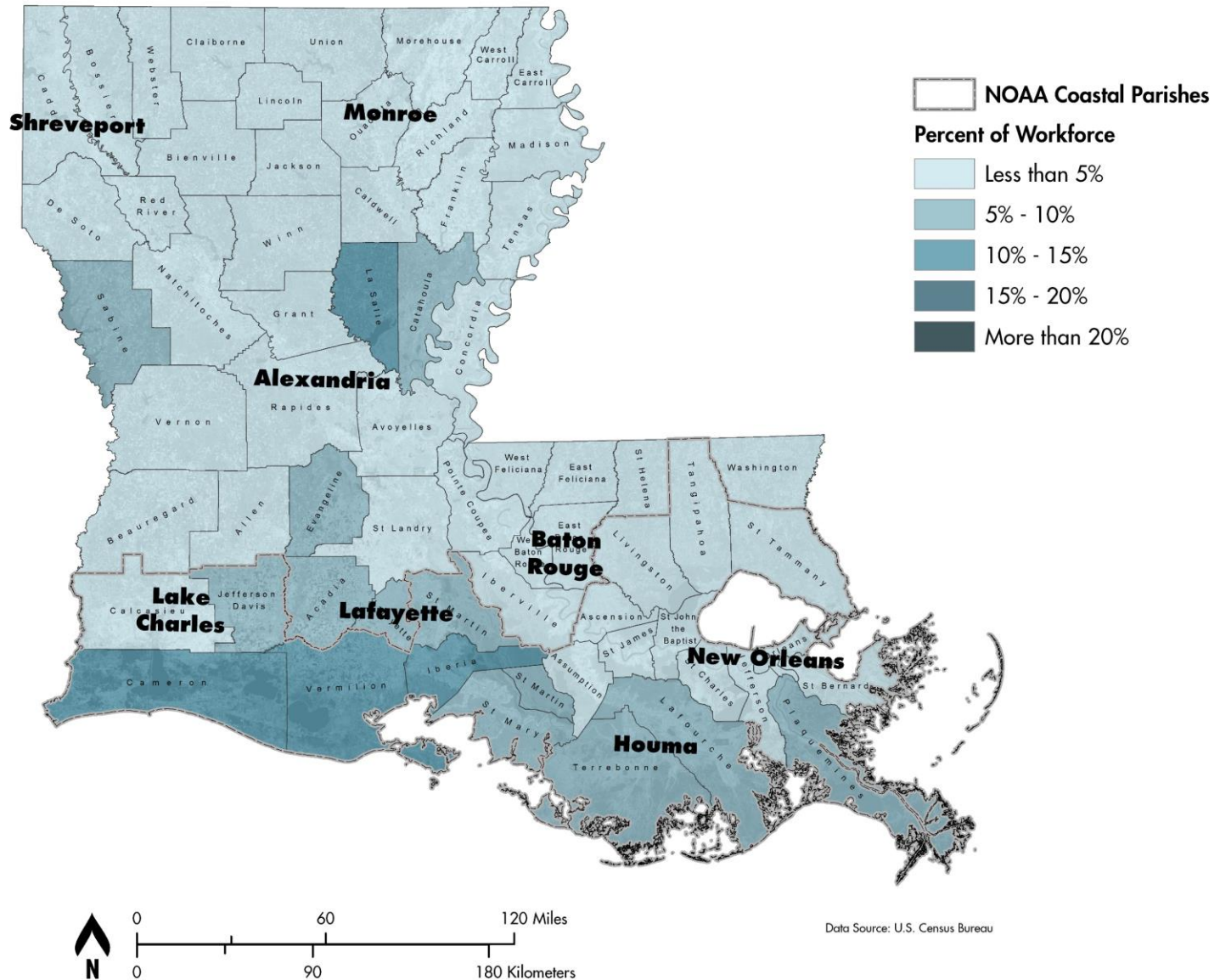


Data Source: U.S. Census Bureau

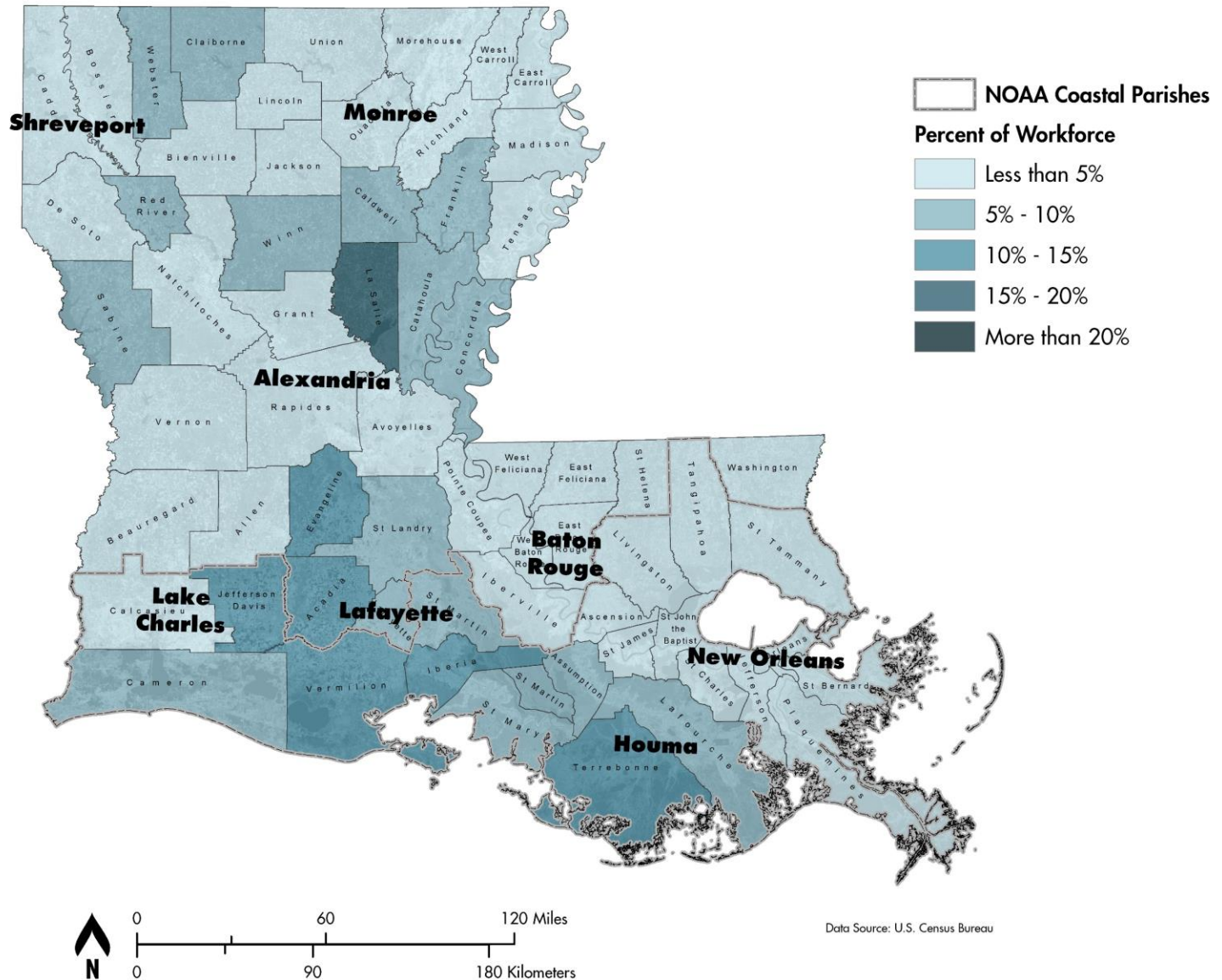
Percent of the Workforce Employed in Oil and Gas (1990)



Percent of the Workforce Employed in Oil and Gas (2000)



Percent of the Workforce Employed in Oil and Gas (2010)



PRESENTATION OUTLINE

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1950's to 2010's

Trends in socioeconomic variables
1950's to 2010's

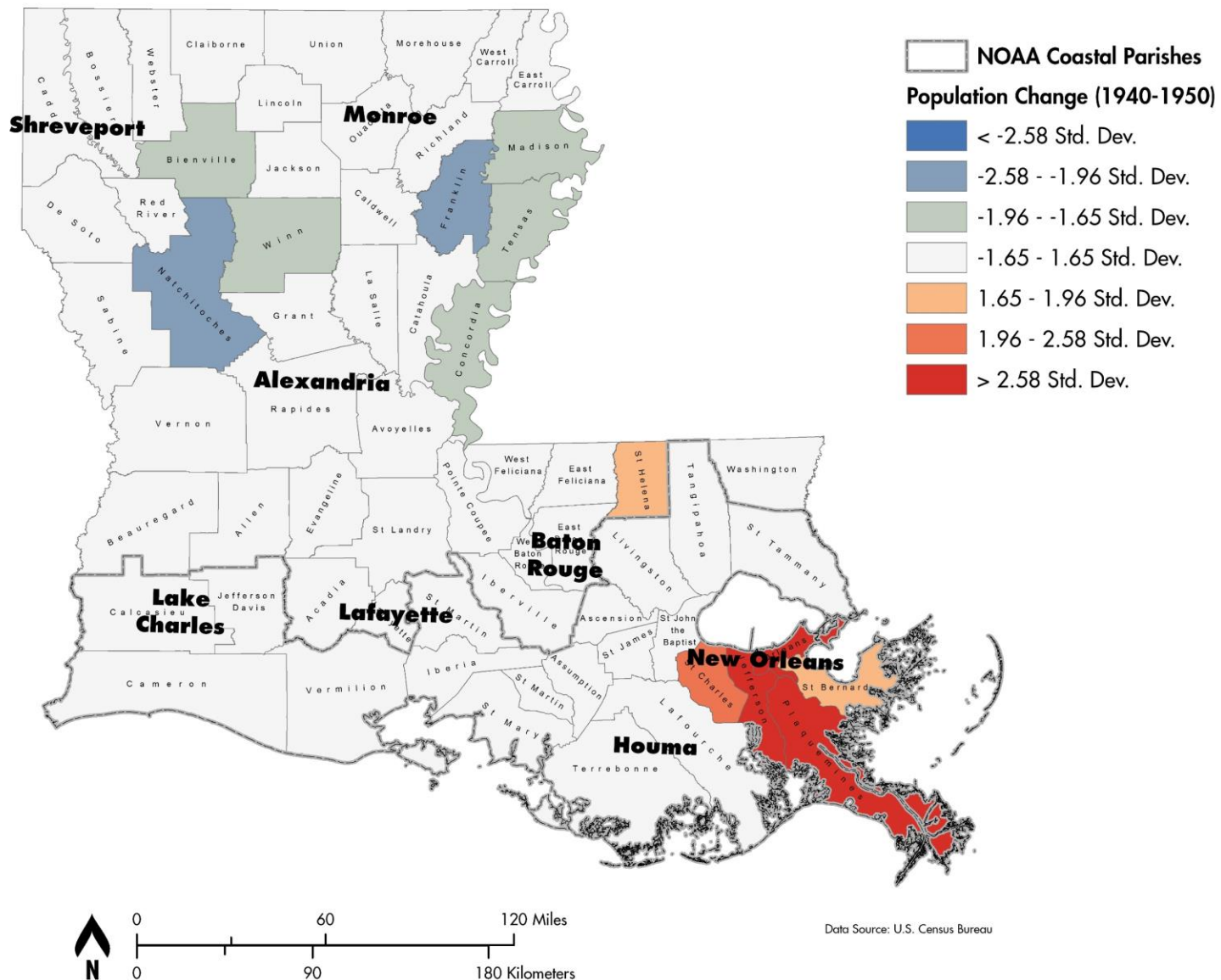
Trends in historical environmental change
1950's to 2010's

Trends in economic wellbeing
1950's to 2010's

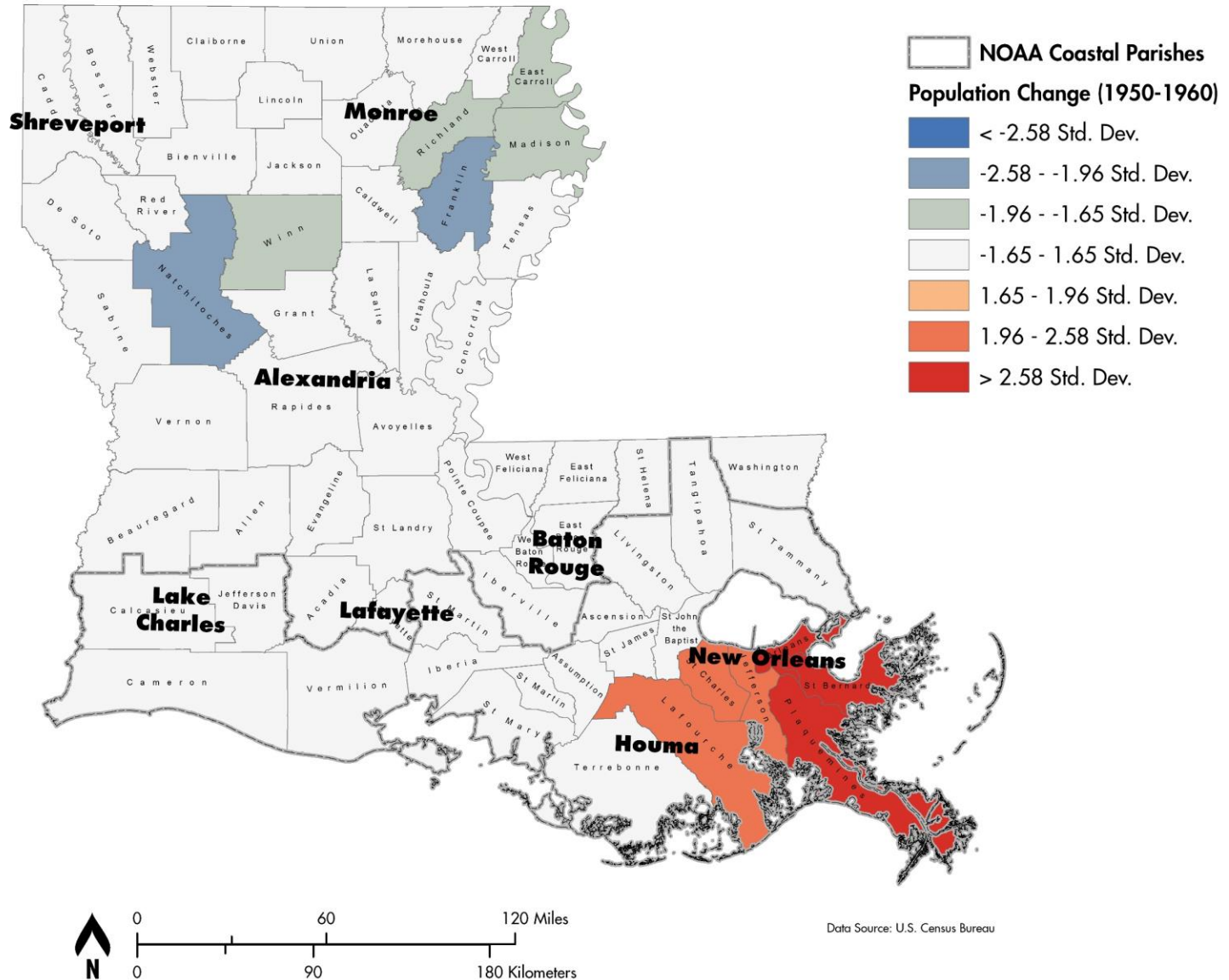
Linkages and next phase



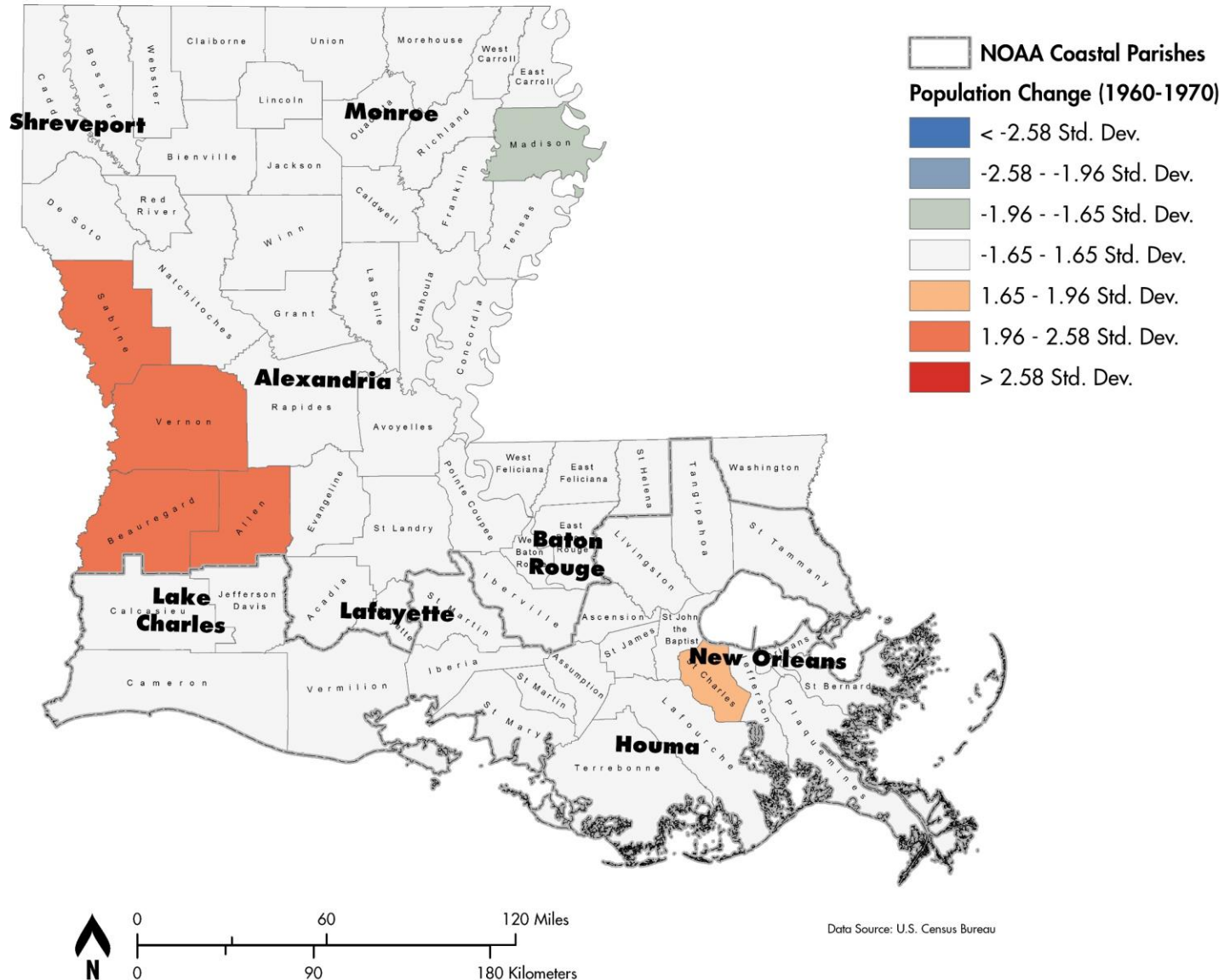
Clusters of Population Growth and Decline in Louisiana Parishes



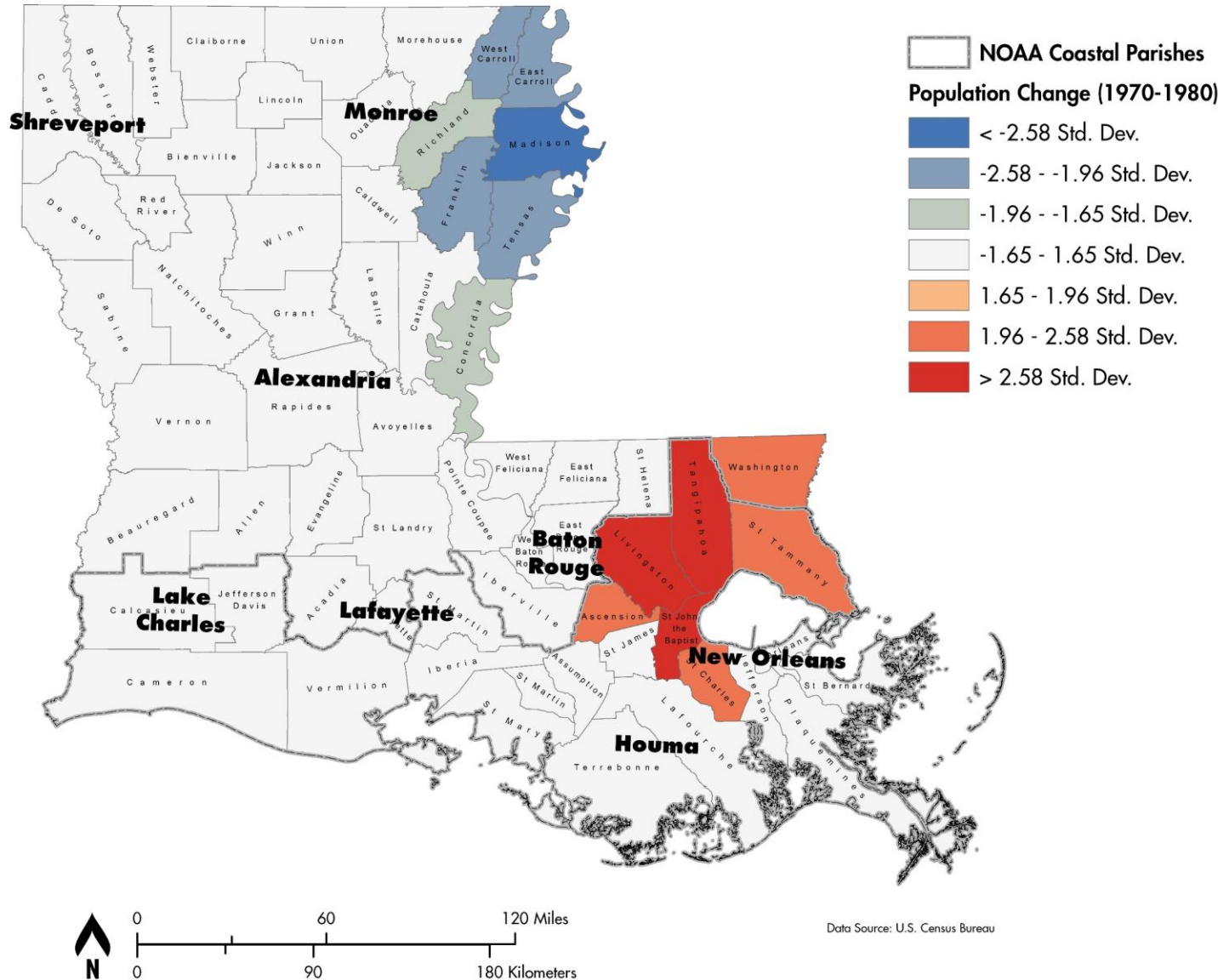
Clusters of Population Growth and Decline in Louisiana Parishes



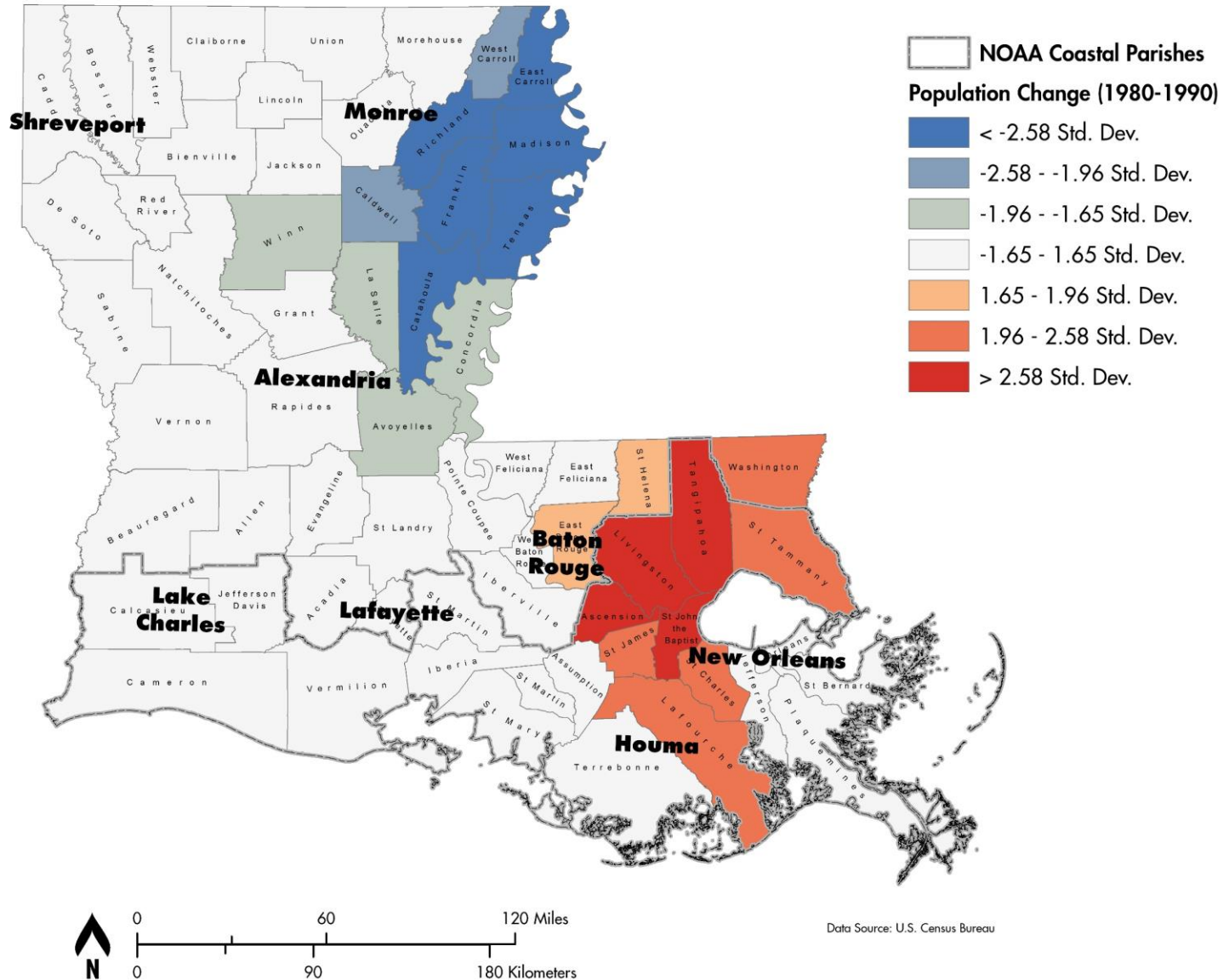
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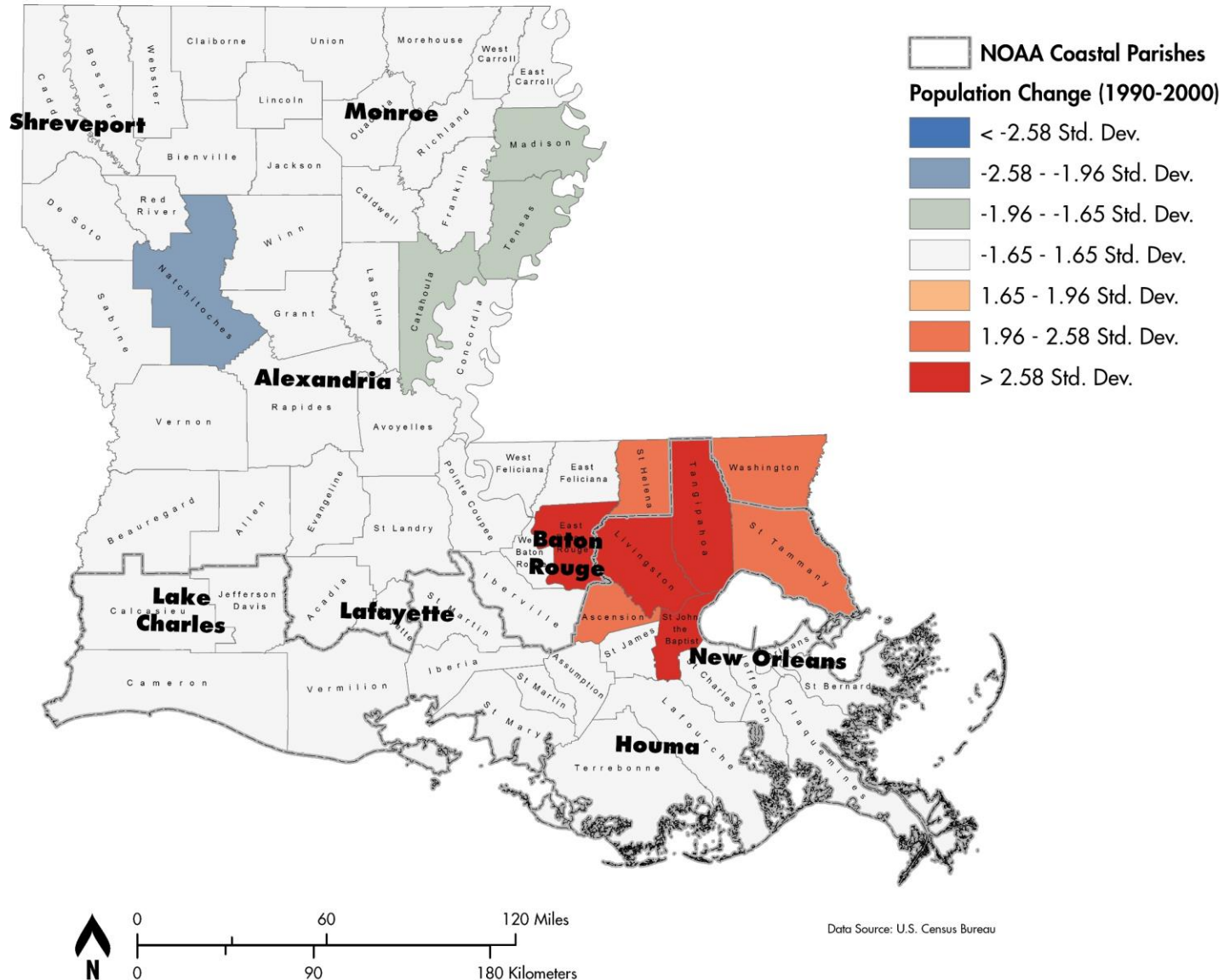
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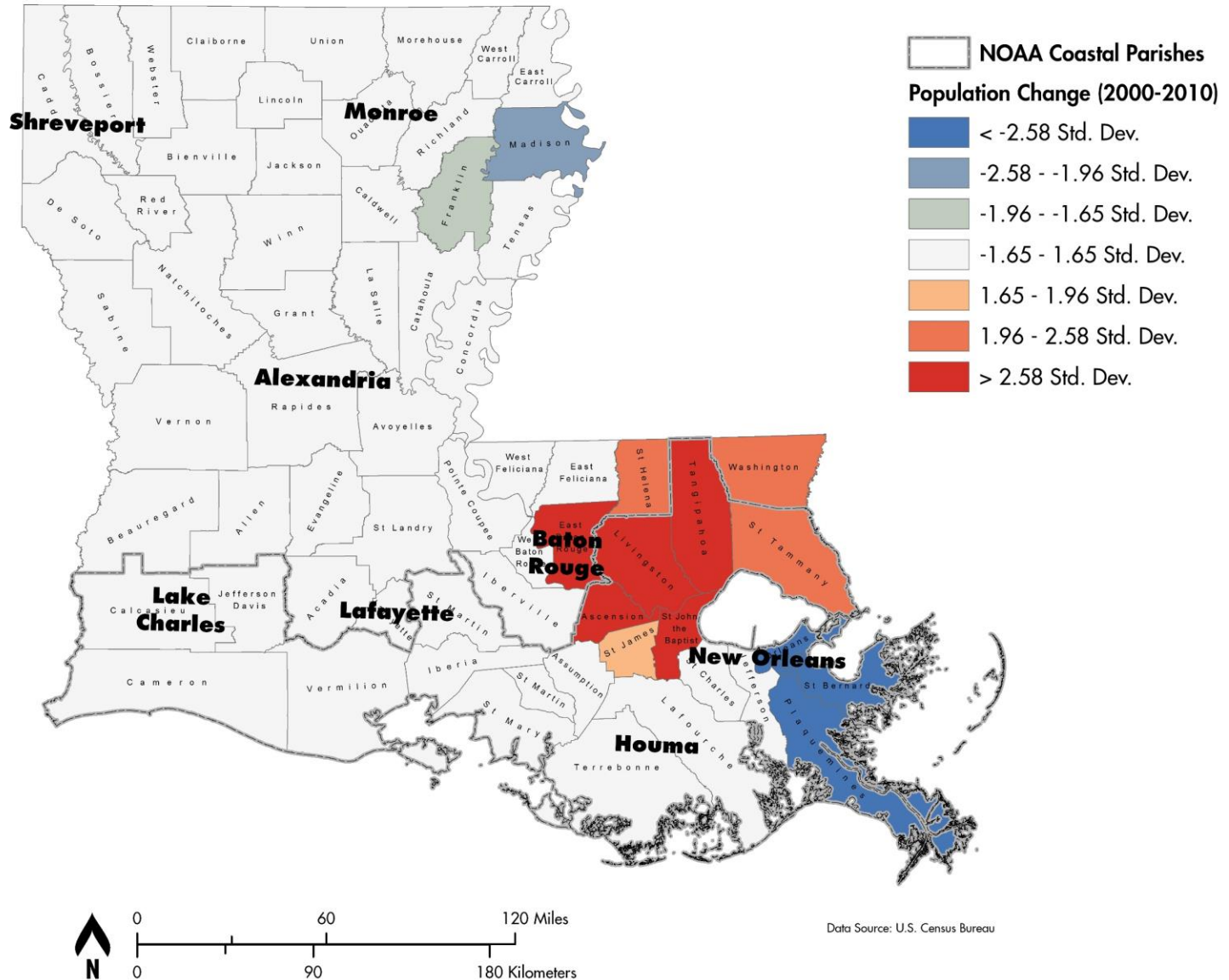
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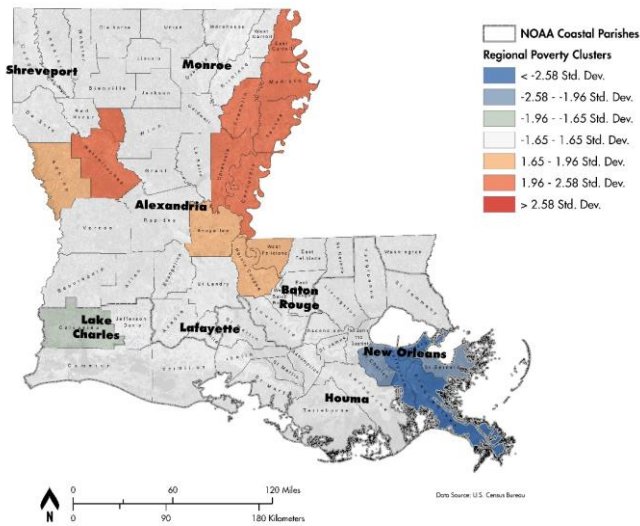
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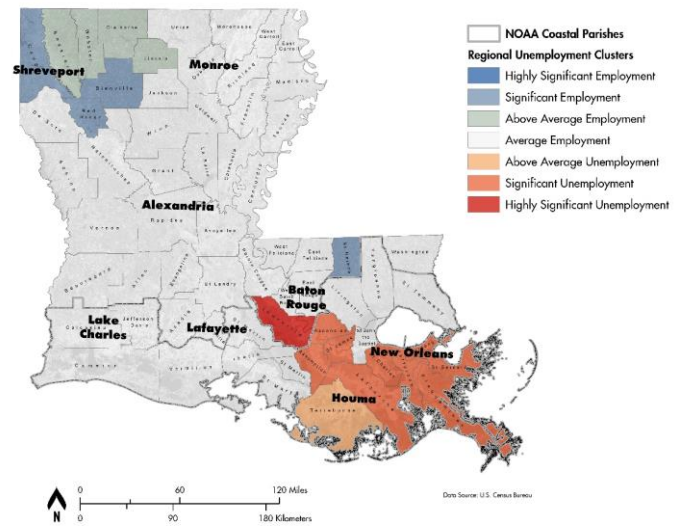
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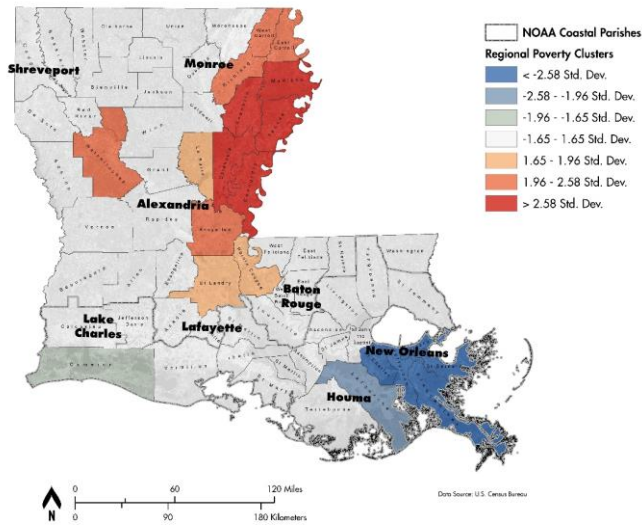
Clusters of High and Low Poverty in Louisiana Parishes (1950)



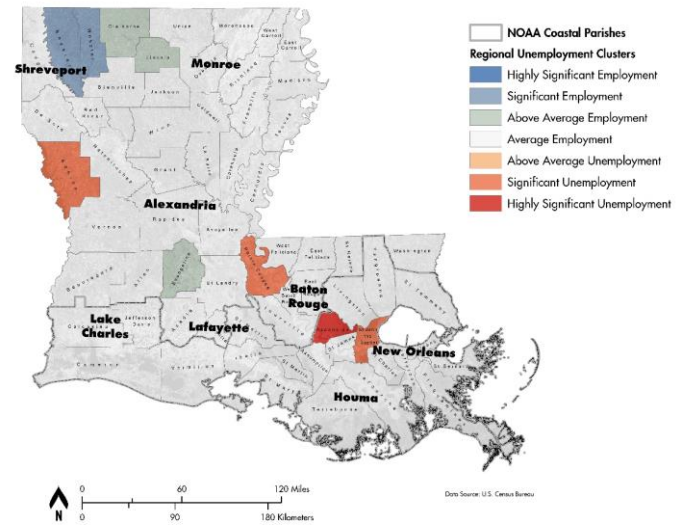
Clusters of High and Low Unemployment in Louisiana Parishes (1950)



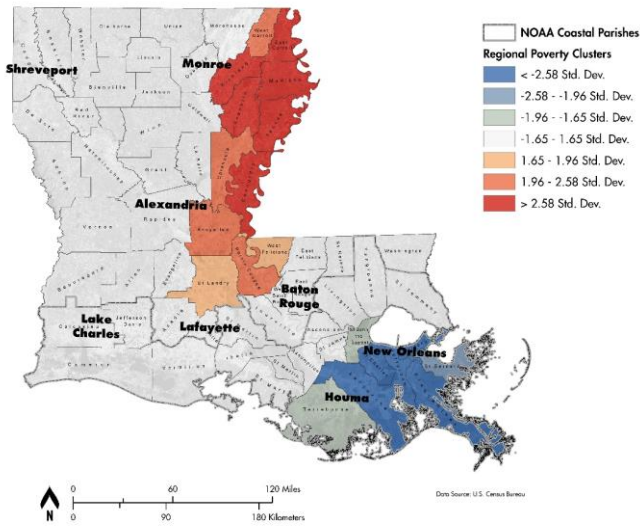
Clusters of High and Low Poverty in Louisiana Parishes (1960)



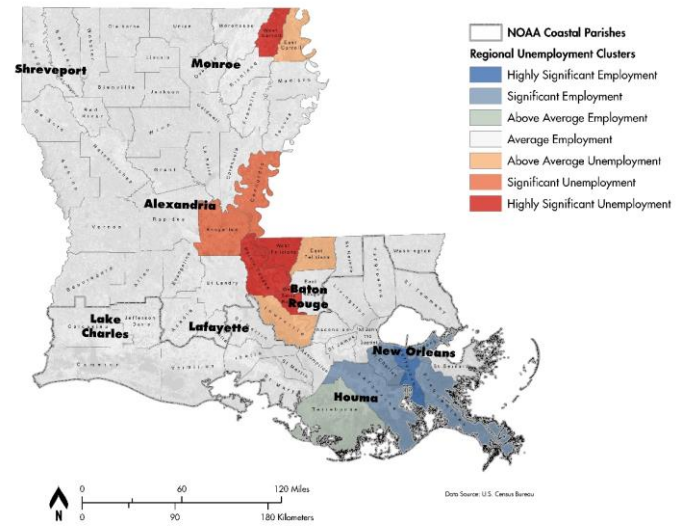
Clusters of High and Low Unemployment in Louisiana Parishes (1960)



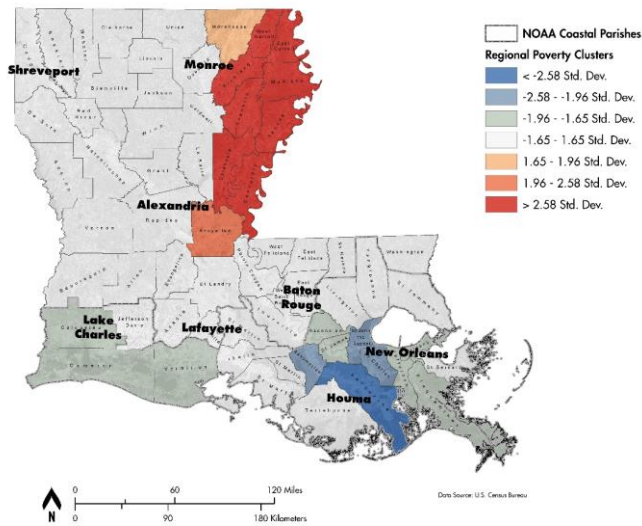
Clusters of High and Low Poverty in Louisiana Parishes (1970)



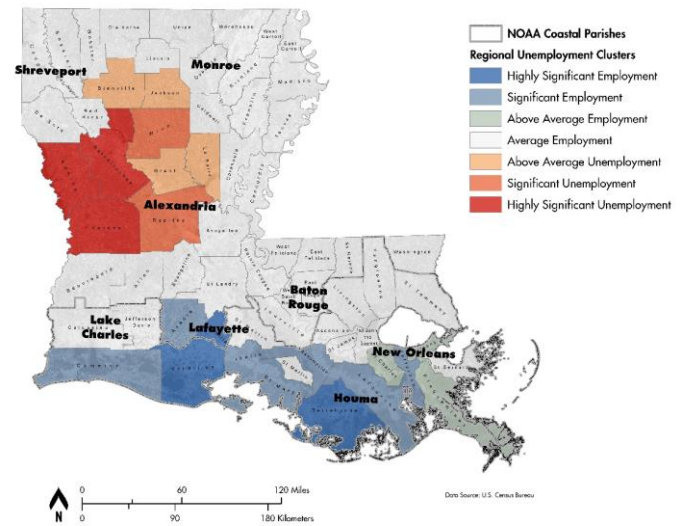
Clusters of High and Low Unemployment in Louisiana Parishes (1970)



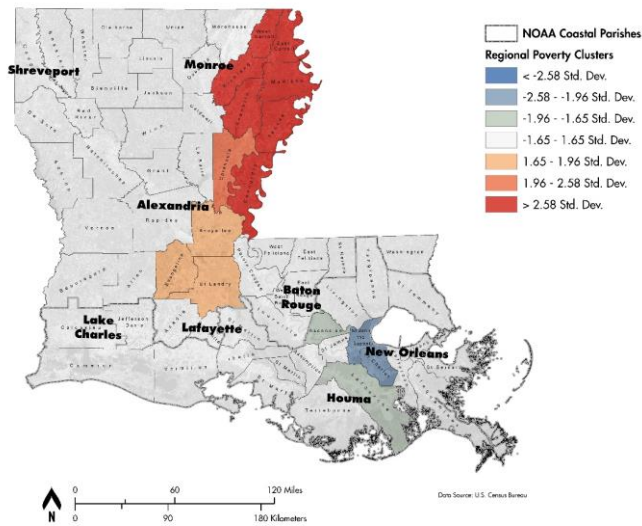
Clusters of High and Low Poverty in Louisiana Parishes (1980)



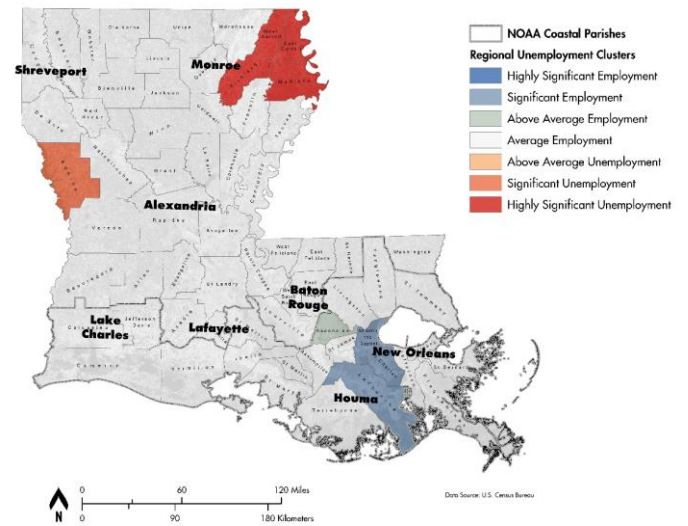
Clusters of High and Low Unemployment in Louisiana Parishes (1980)



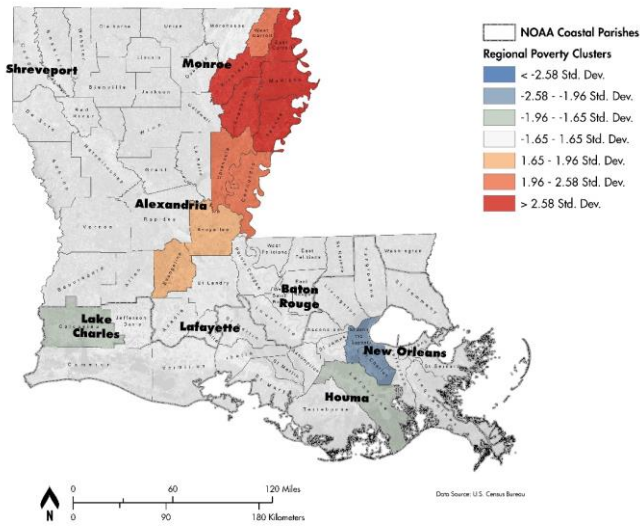
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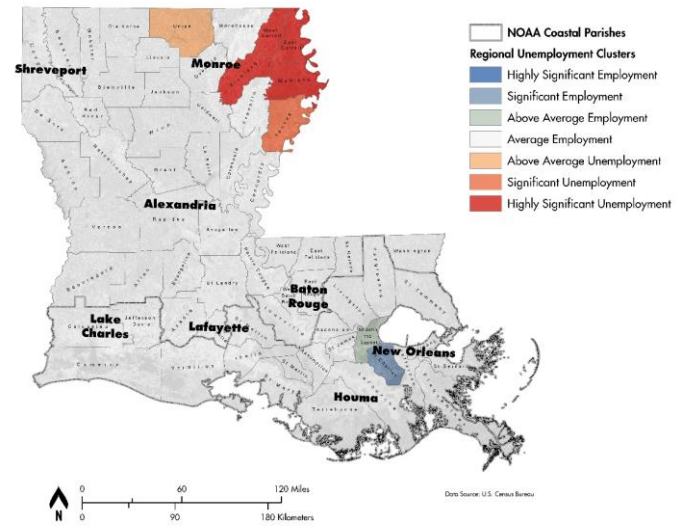
Clusters of High and Low Unemployment in Louisiana Parishes (1990)



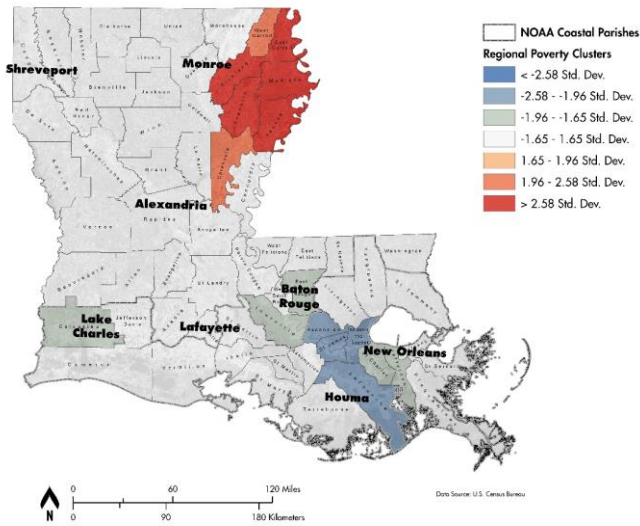
Clusters of High and Low Poverty in Louisiana Parishes (2000)



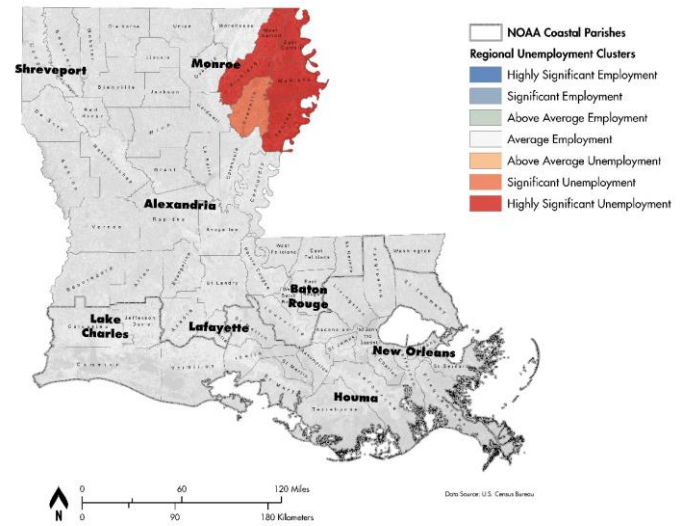
Clusters of High and Low Unemployment in Louisiana Parishes (2000)



Clusters of High and Low Poverty in Louisiana Parishes (2010)



Clusters of High and Low Unemployment in Louisiana Parishes (2010)



PRESENTATION OUTLINE

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1950's to 2010's

Trends in economic wellbeing
1950's to 2010's

Linkages and next phase

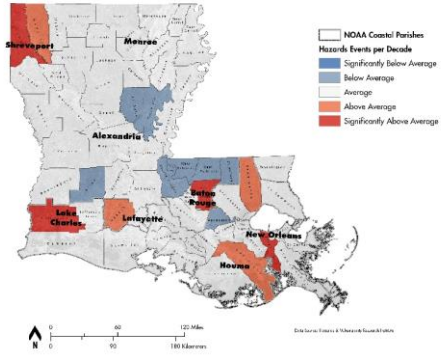


TWO MAIN CATEGORIES OF DISTURBANCE...

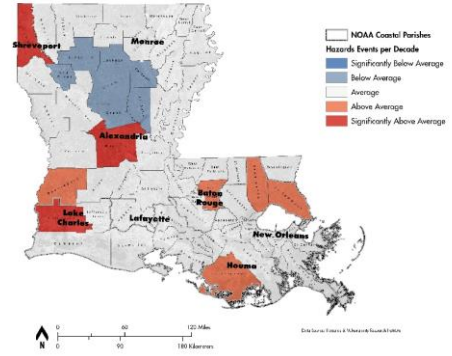
- Exogenous Discrete Events or System Shocks
 - The impact of a single shock on resilience could be measured in a single decade
 - It might take a generation to learn how a region changes as a result of repeated shocks



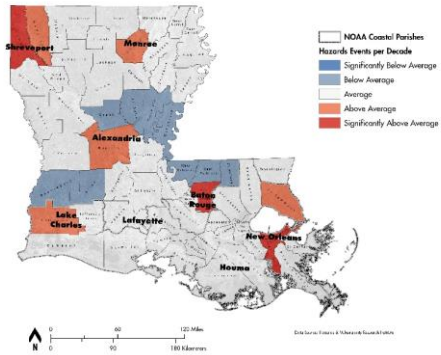
Total Hazards Events (1970-1980)



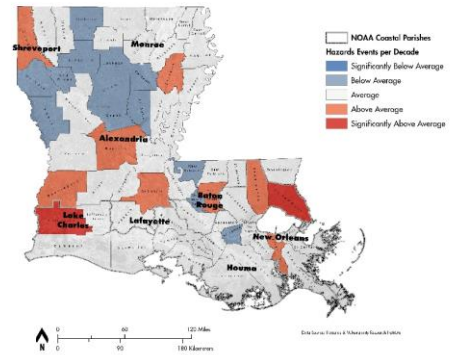
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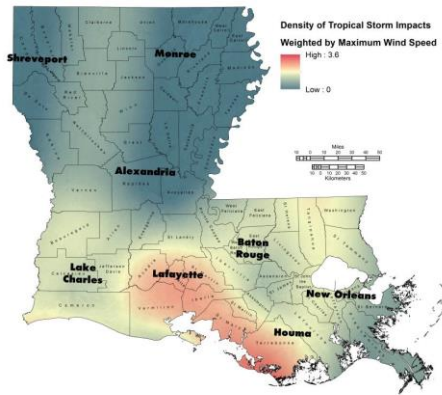
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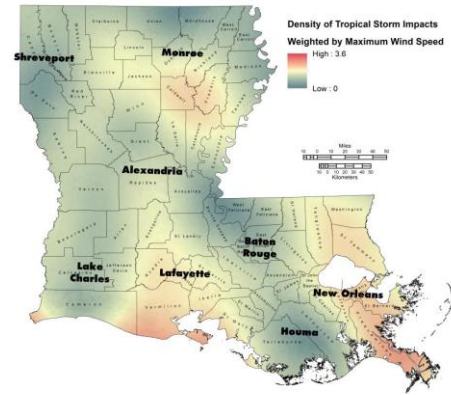
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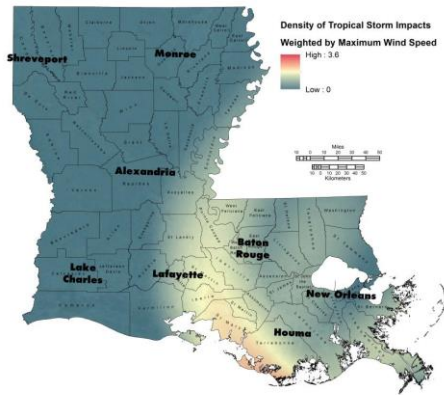
1970-1980



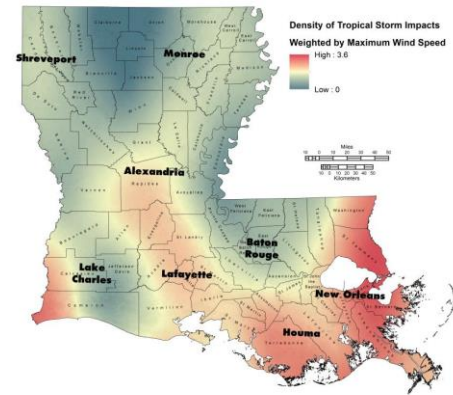
1980-1990



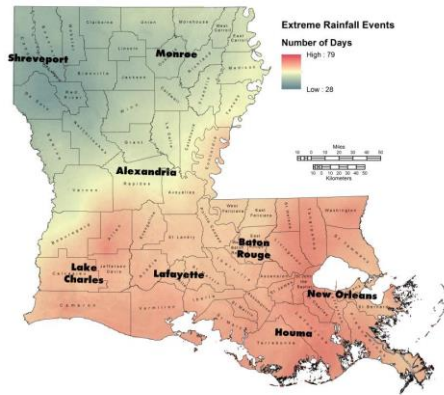
1990-2000



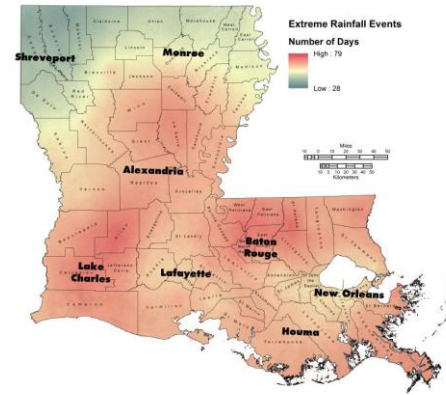
2000-2010



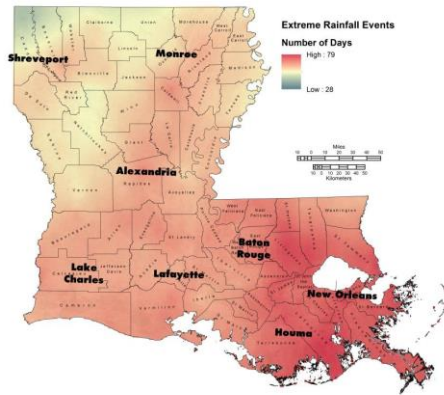
1970-1980



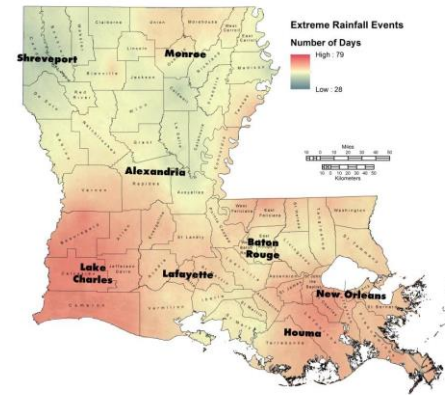
1980-1990



1990-2000



2000-2010



PRESENTATION OUTLINE

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1950's to 2010's

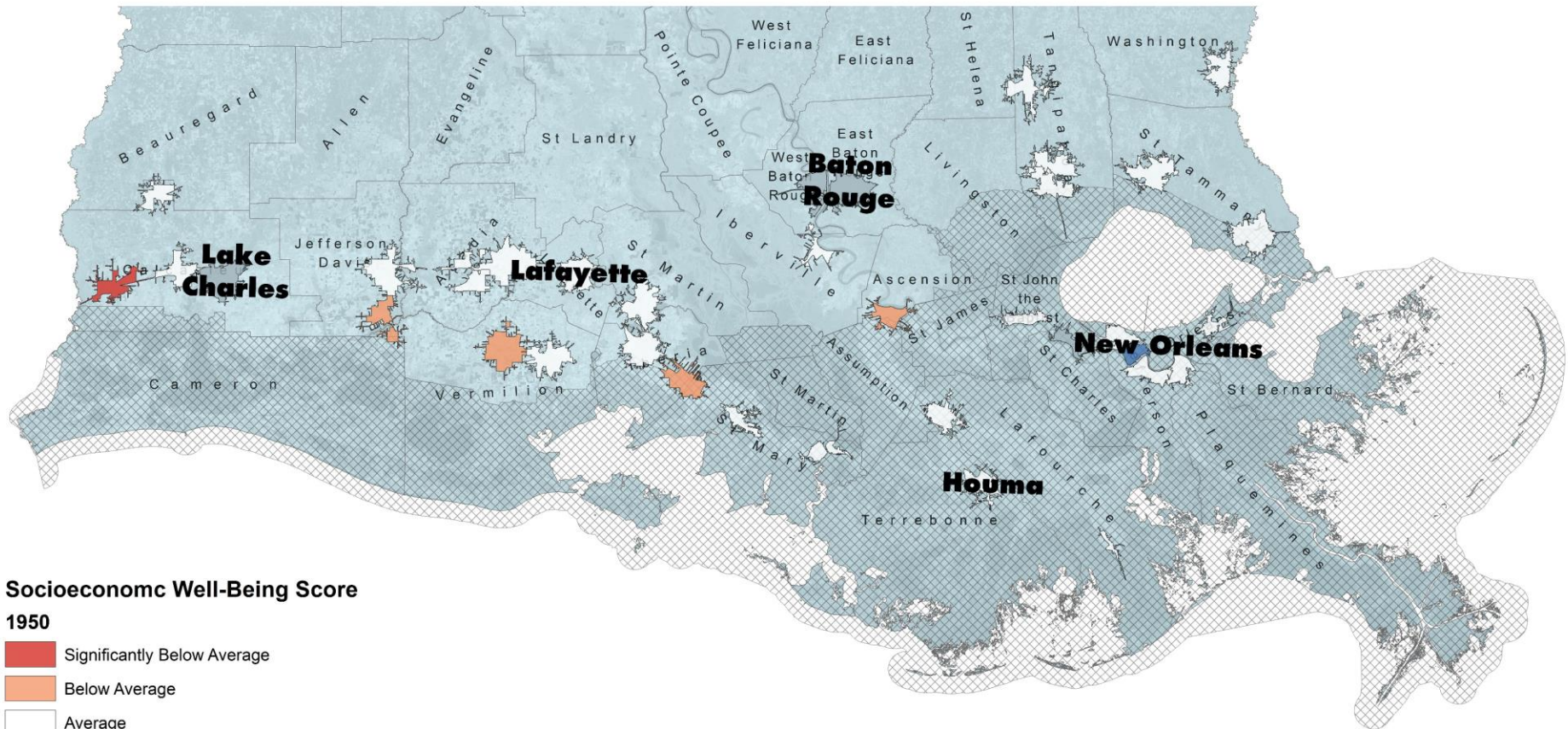
Trends in socioeconomic variables
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Linkages and next phase

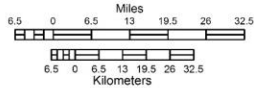


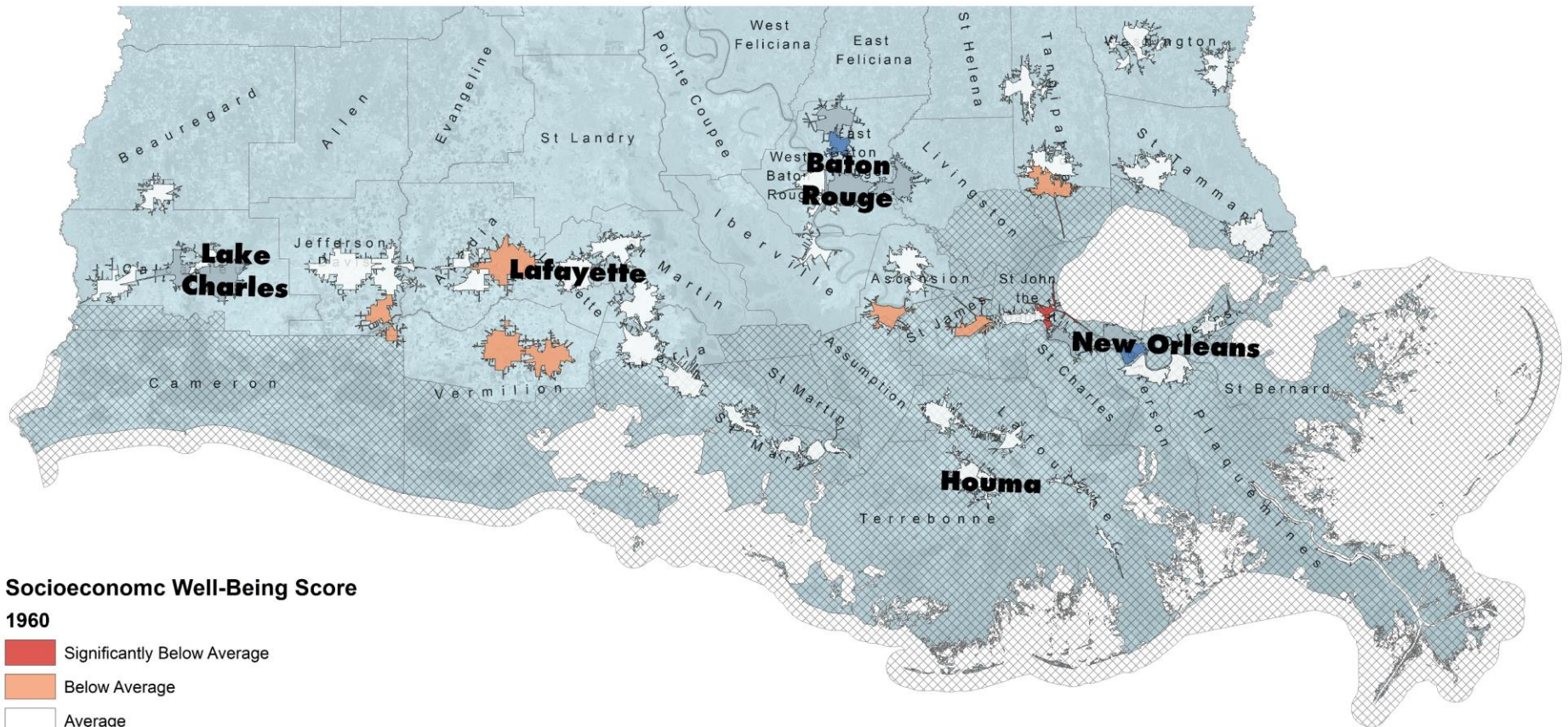


Socioeconomic Well-Being Score

1950

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

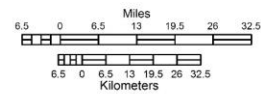


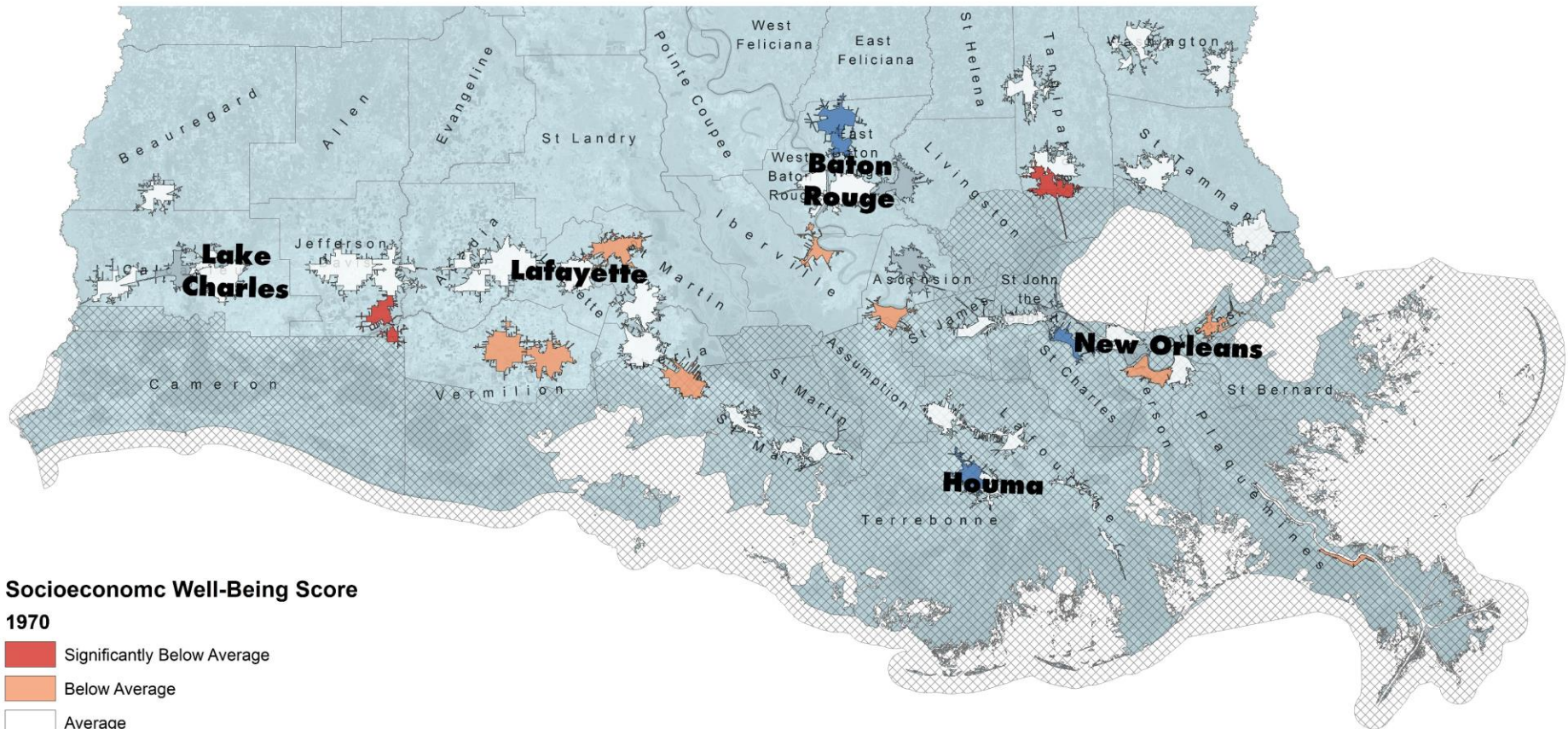


Socioeconomic Well-Being Score

1960

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

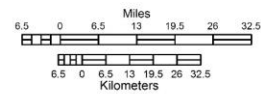


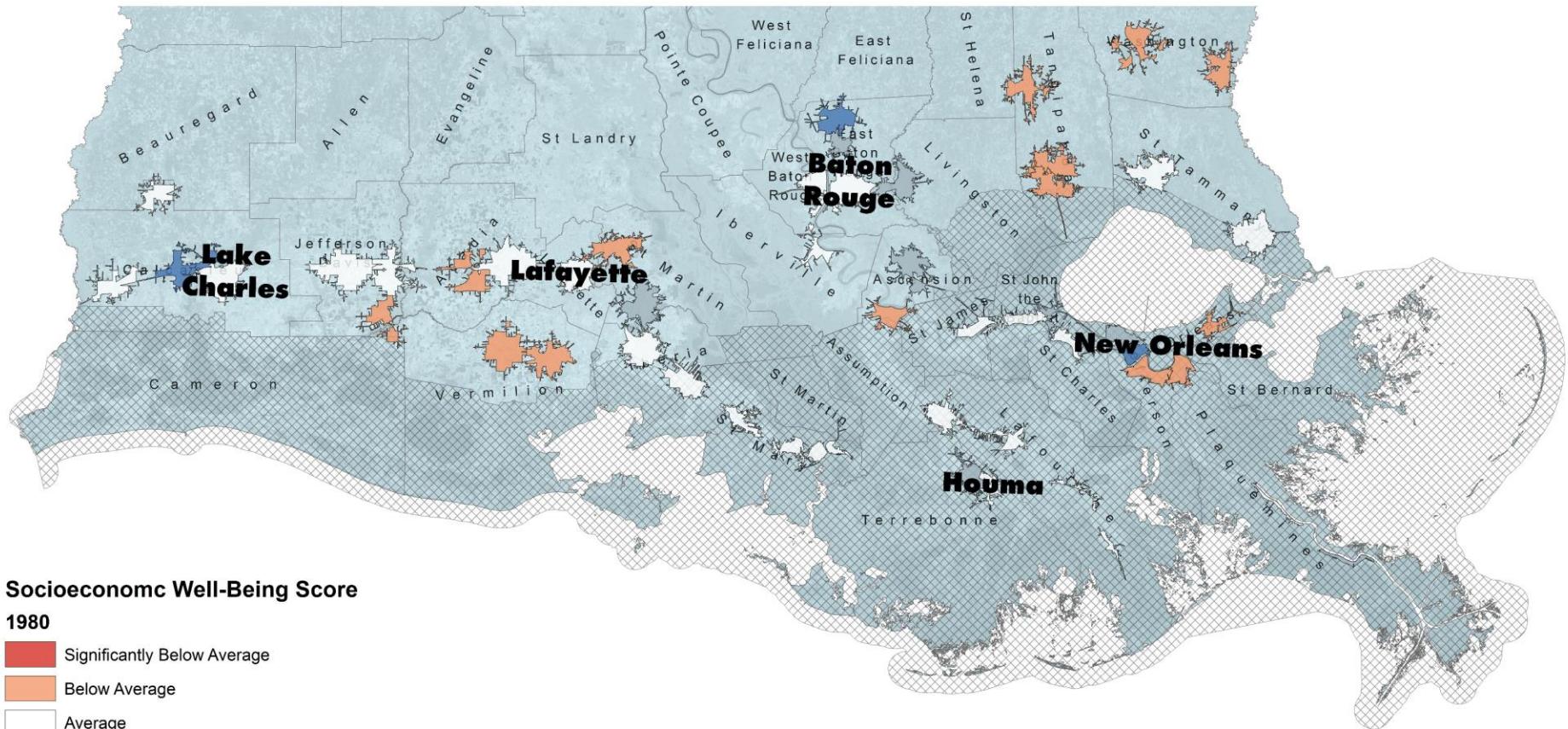


Socioeconomic Well-Being Score

1970

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

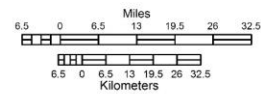


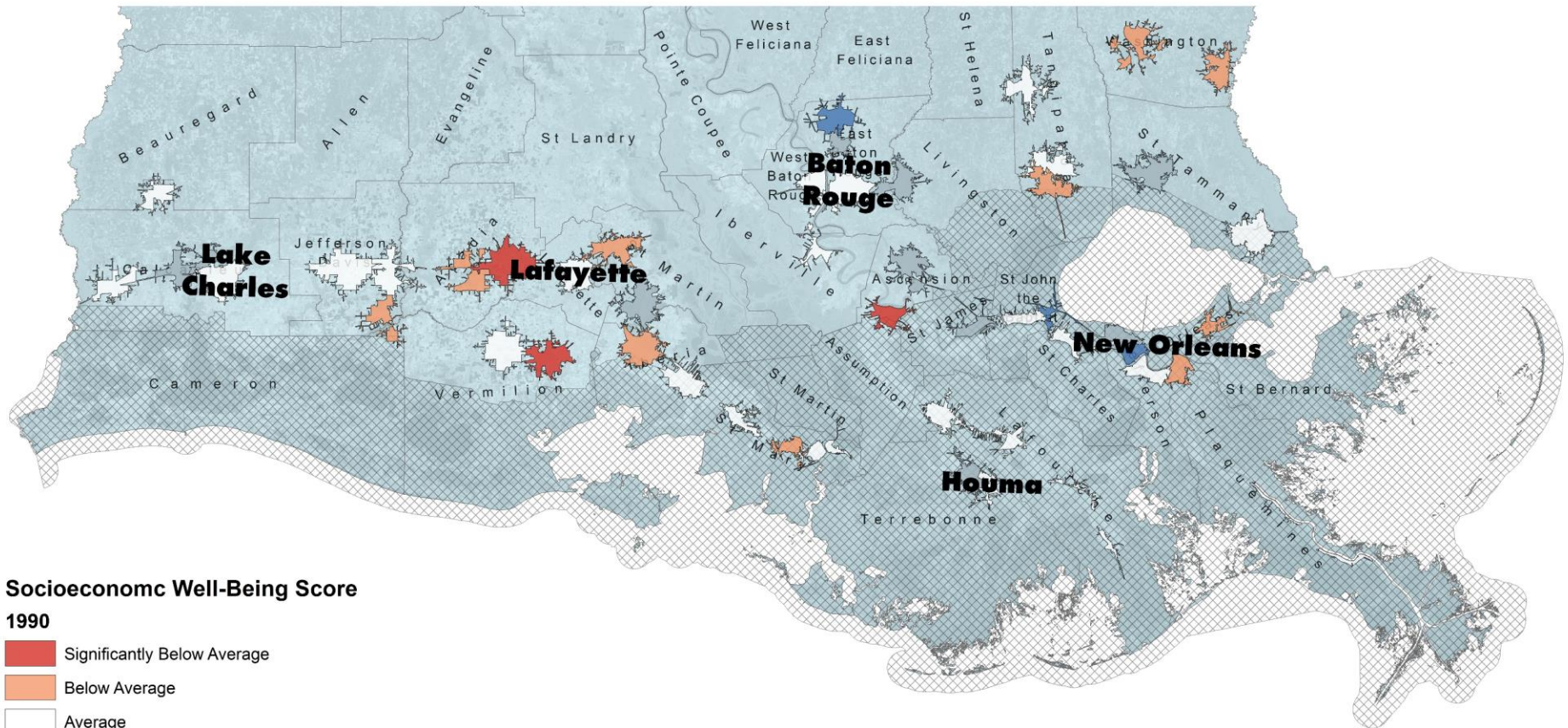


Socioeconomic Well-Being Score

1980

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

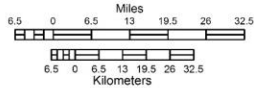


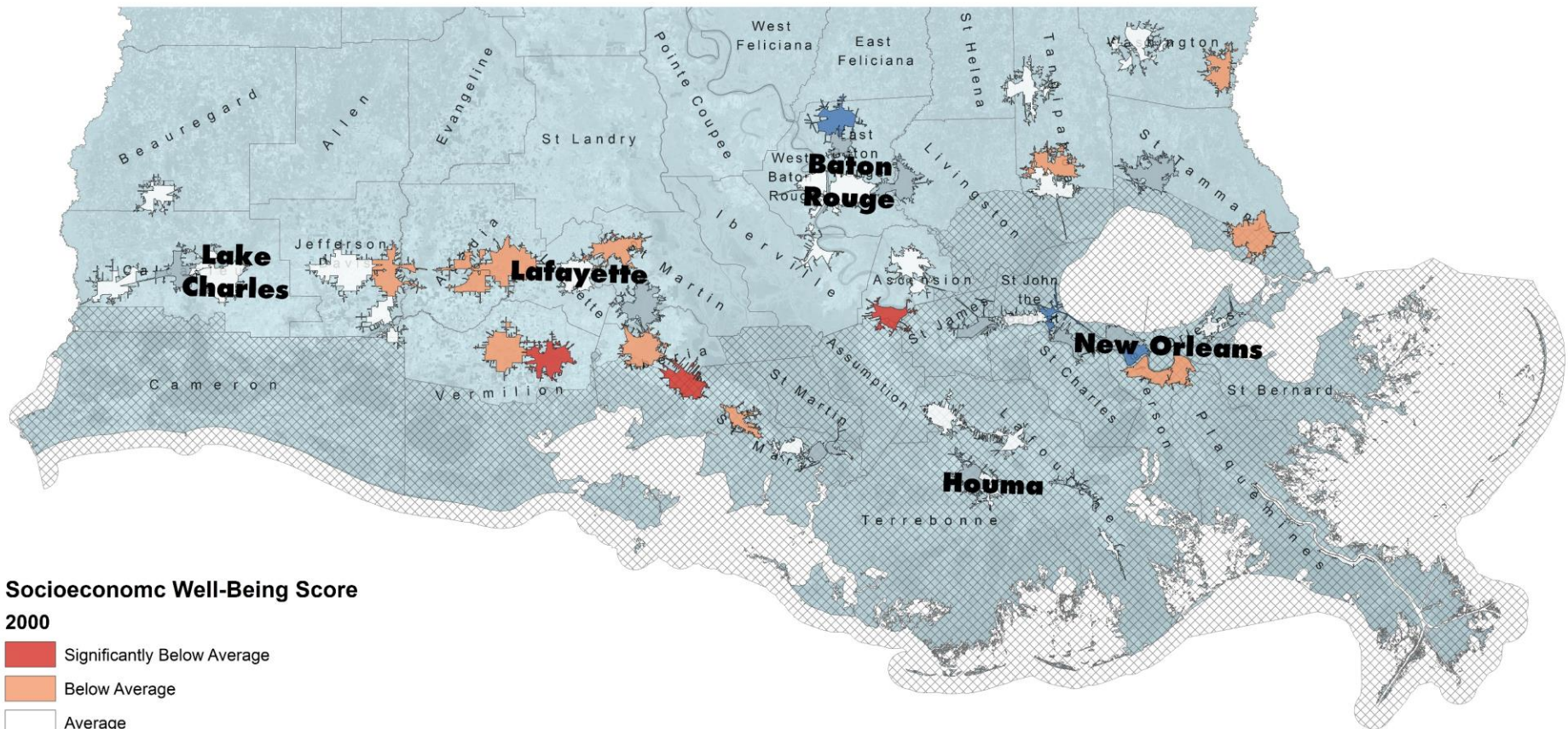


Socioeconomic Well-Being Score

1990

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

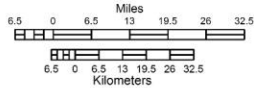


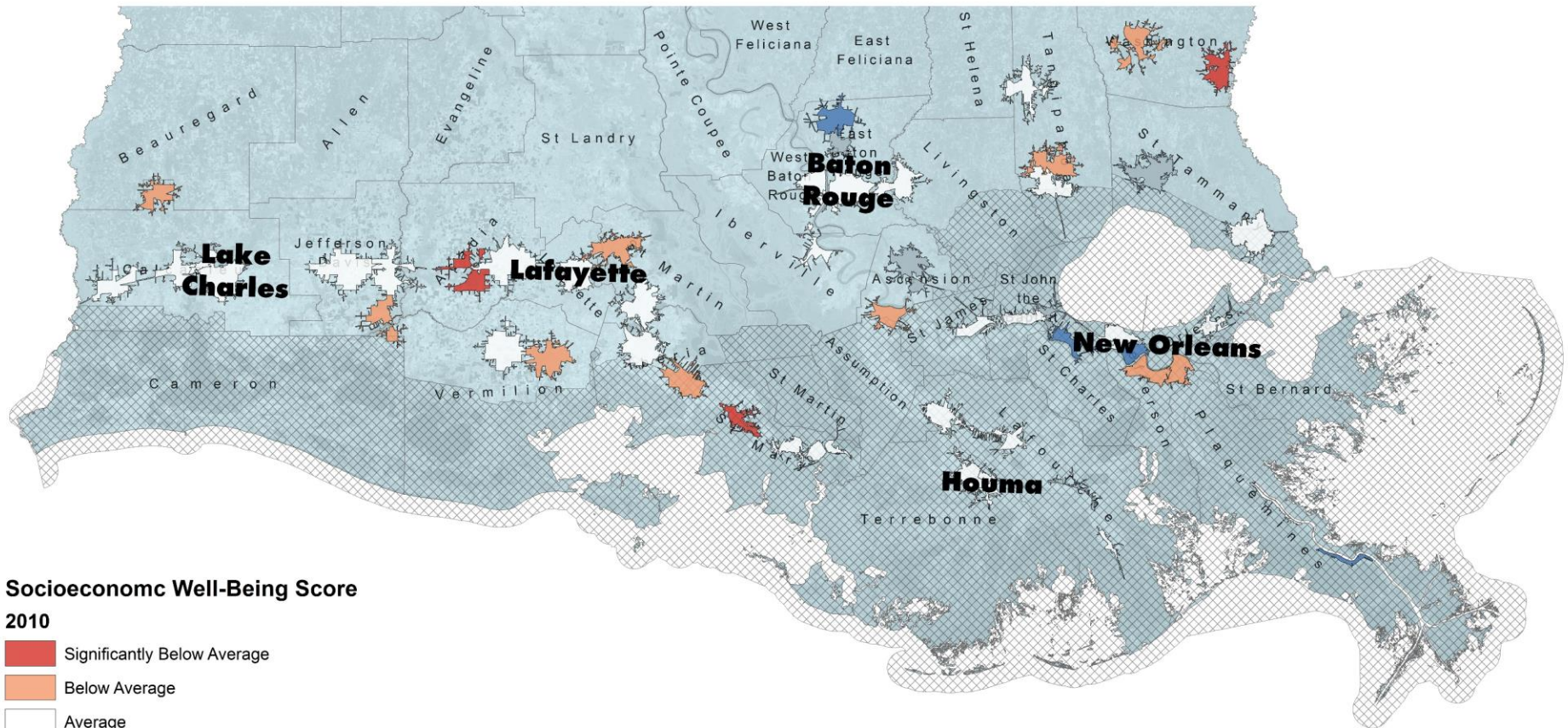


Socioeconomic Well-Being Score

2000

- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average

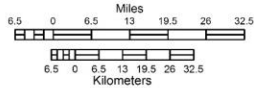


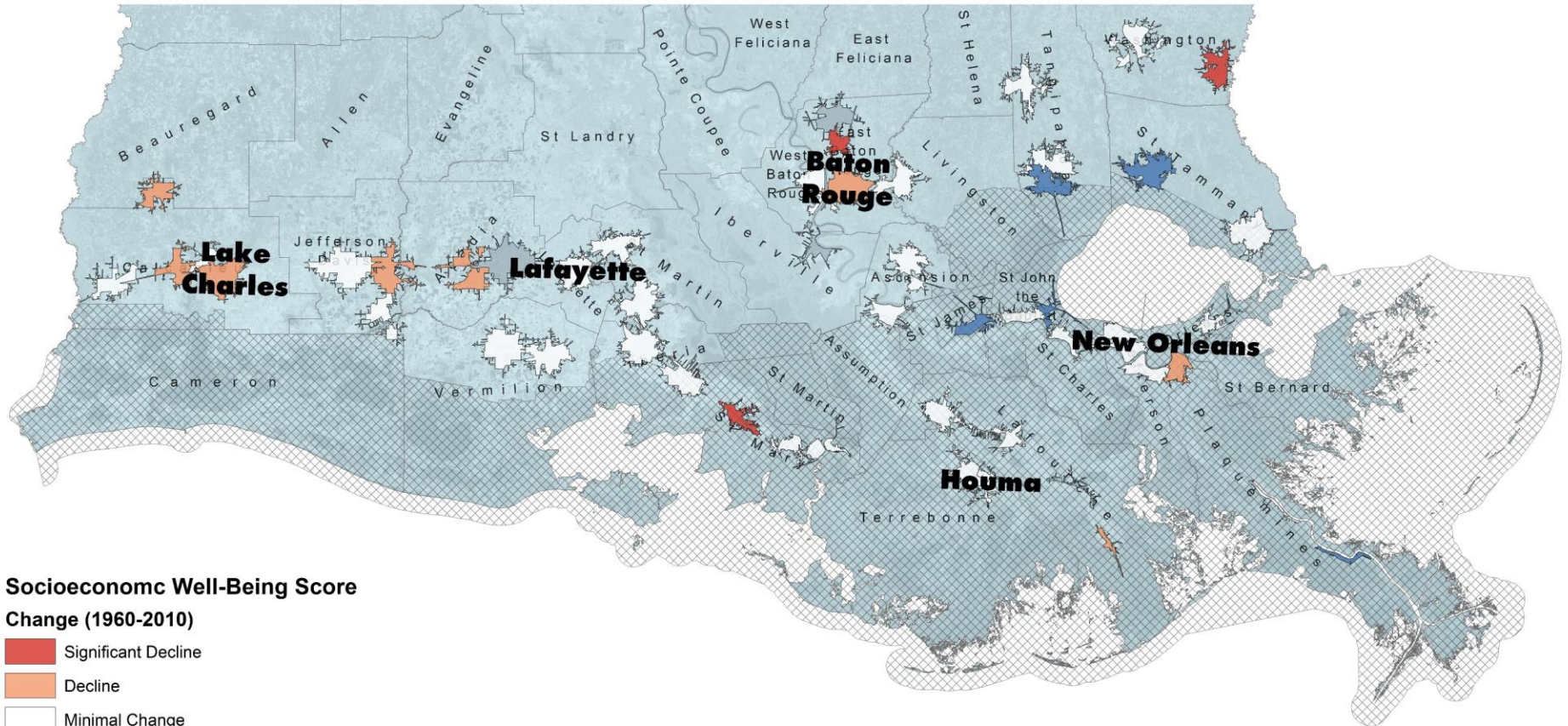


Socioeconomic Well-Being Score

2010

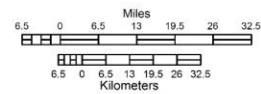
- Significantly Below Average
- Below Average
- Average
- Above Average
- Significantly Above Average





**Socioeconomic Well-Being Score
Change (1960-2010)**

- Significant Decline
- Decline
- Minimal Change
- Improvement
- Significant Improvement



PRESENTATION OUTLINE

Trends in oil and gas development
1950's to 2010's

Trends in socioeconomic variables
1950's to 2010's

Trends in historical environmental change
1950's to 2010's

Trends in economic wellbeing
1950's to 2010's

Linkages and next phase



LINKAGES AND NEXT PHASE

- Initial results suggest that the development of the oil and gas industry is not a primary driver of population movement and migration.
- The growth of the oil and gas economy does correlate with changes in economic wellbeing (indicated by factors such as poverty, unemployment levels, and property ownership) at both the parish and community scale.
- The next phase of research will utilize statistical analysis and modeling to explore the impacts of exogenous environmental and economic conditions on these variables.



LINKAGES AND NEXT PHASE

- Mapping and assessing the historical interactions of oil and gas development, environmental change, and socioeconomic change to anticipate future impacts of development.
- However, observed patterns in the data allow us to see significant correlations, but not establish direct cause and effect relationships.
- The next phase of research will utilize qualitative research methods to assess the linkages and correlations observed in the data.



NEXT STEP: TYING PATTERNS IN THE DATA TO EXISTING ETHNOGRAPHIC WORK

Code System	Higgins (2002)	Morgan City Chronicles	2010_block_level_maps	laska et al 2004
Location				
Demographics				
Social Change				
relocation due to climate change				
relocation due to job loss				
socio-economic change related to oil and gas				
culture of work				
community description				
environmental change (long term)				
demographic change				
Infrastructure				
Economy				
Auxiliary oil and gas businesses				
loss of individual/family income				
changes to local business				
cutbacks to city and municipal budgets				
Shipbuilding				
shift from oil and gas to other economic industry				
unemployment				
layoffs				
oil price downturn				
agriculture				
petroleum industry				
natural gas industry				
commercial fishing				
recreational fishing				
subsistence fishing				
other natural resource industries				
tourism				
Event				
oil spill (acute)				
oil spill (long-term)				
hurricane				
strom even (non-hurricane)				
drought				
sea-level rise				
climate change				
land loss				
pollution				
political event				

NEXT STEP: TYING PATTERNS IN THE DATA TO EXISTING ETHNOGRAPHIC WORK

The screenshot displays a software interface for analyzing ethnographic data. On the left, a 'Document System' pane shows a tree view of files, including 'Higgins (2002) Morgan City Chronicles'. Below it, a 'Code System' pane lists various demographic and social categories with associated counts. The main window shows the document text, which is annotated with colored brackets and labels from the code system. For example, a red bracket labeled '..Late 1990s' is positioned over the text 'During the nearly two years our research team collected data in Morgan City, Louisiana, things certainly changed...'. A blue bracket labeled '..oil price downturn' is positioned over the text 'the price of a barrel of oil began to fall steadily in early 1998...'. A photograph of a 'Welcome to Morgan City' sign is included in the document, with a caption below it: 'Figure 2.1 Entering Morgan City'.

Document System

- Oral Histories and Ethnographies 82
 - Higgins (2002) Morgan City Chronicles 82
- Maps 11
 - 2010_block_level_maps 11
- Secondary Sources 68
 - aska et al 2004 68
- Sets 0

Code System

- Demographics 2
 - local tax revenue 2
 - age 0
 - income 1
 - raceðnicity 6
 - native americans 1
 - Asian 2
 - Native American 2
 - African American 4
 - unemployment 9
 - poverty 0
 - education 2
 - health 0
- Social Change 0
 - relocation due to climate change 1
 - relocation due to job loss 1
 - socio-economic change related to oil and gas 3
 - culture of work 4
 - community description 7
 - environmental change (long term) 2
 - demographic change 0
- Infrastructure 18
- Economy 0
 - Auxiliary oil and gas businesses 1
 - loss of individual/family income 3
 - changes to local business 2
 - cutbacks to city and municipal budgets 1
 - Shipbuilding 1
 - shift from oil and gas to other economic industry 7

Higgins (2002) Morgan City Chronicles (Page 1/50)

PART 2
MORGAN CITY CHRONICLES: LIVING THROUGH A DOWNTURN
 Rylan Higgins

INTRODUCTION

"You do not know what the impact is, because the effects are so evolving. By the time you figure out what is going on, everything has changed" [I-005].

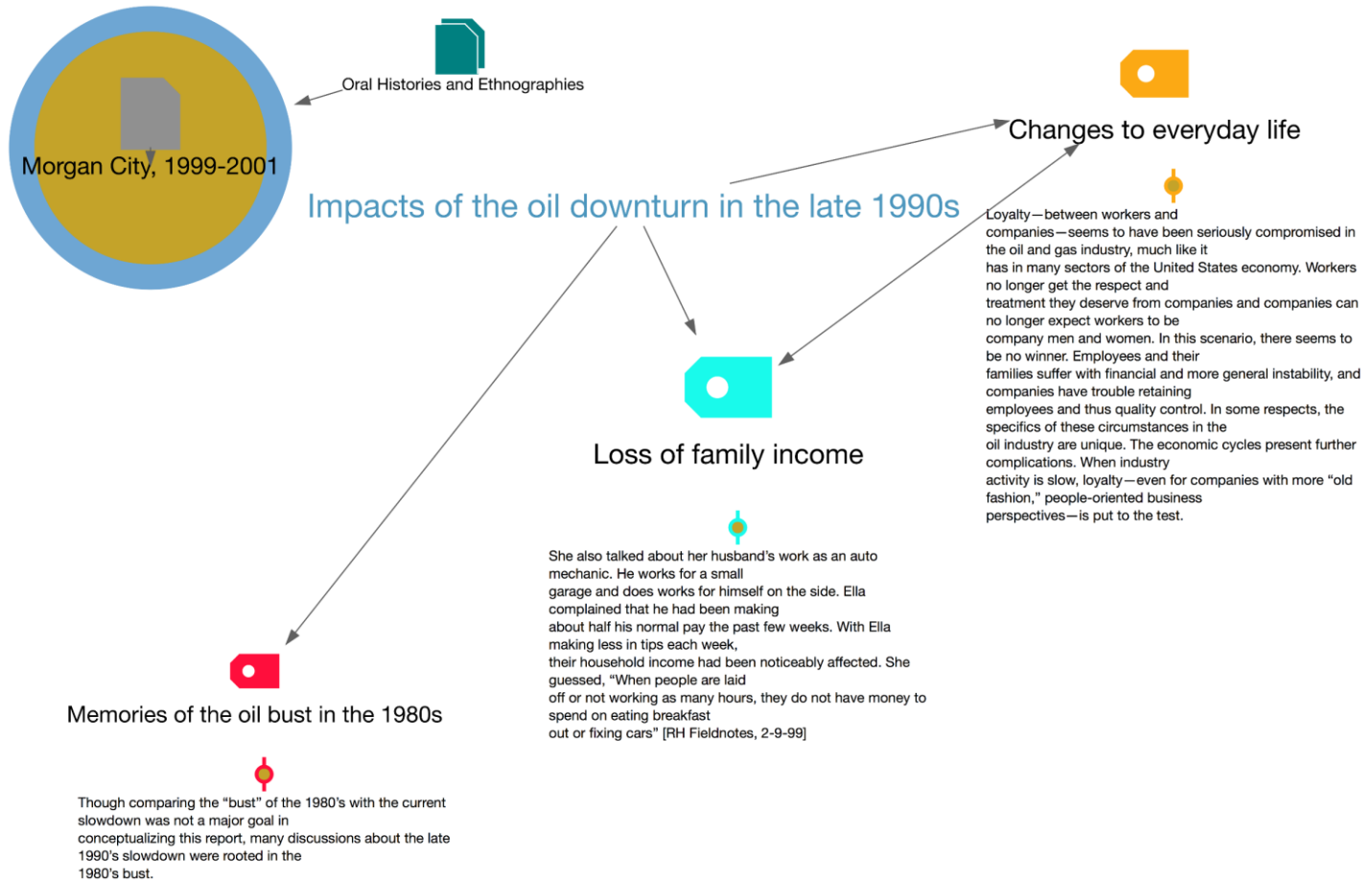
During the nearly two years our research team collected data in Morgan City,¹ Louisiana, things certainly changed—as this community leader predicted they would. Coming in from the west, our first glimpse of this community involved two now-familiar city icons: their retired shrimp boat and welcome sign (see fig. 2.1). From the start, it was obvious that Morgan City stood poised to experience a shift from good economic times to bad. After approximately two years of promising developments in offshore exploration and production, the price of a barrel of oil began to fall steadily in early 1998, and the resulting drop in industry activity had just begun to impact local oil and oil-related businesses when our team arrived in September of that year.

This economic shift affected how people felt and acted in profound and complex ways: it influenced important decisions about life and business for individuals, families and communities. In Morgan City, such change was anything but new. For nearly five decades, the community has faced the benefits and problems that accompany the ebb and flow of oil activity. Some have claimed that the people of southern Louisiana have learned little from these past cycles, but our on-the-ground picture provides a broad look at a people and a community struggling—sometimes successfully—to keep the past from repeating itself. However, for all the similarities of the recent downturn to the past, the current juncture in the evolution of this global industry presents new hurdles and unforeseen challenges.

Now more than ever, events taking place far from the Acadian oilpatch shape the lives of Acadian people. As the industry moves to deeper waters and more distant lands, the people of Morgan City pin their hopes on playing an important role in the changing industry. Yet this role is not assured. While their city was once *the* hub of offshore activity, the changing demands of the industry have some people worried that Morgan City might be left on the sidelines.

Figure 2.1 Entering Morgan City

NEXT STEP: TYING PATTERNS IN THE DATA TO EXISTING ETHNOGRAPHIC WORK





NEXT STEP: QUALITATIVE RESEARCH WITH RESIDENTS OF OIL AND GAS COMMUNITIES



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THANK YOU

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Director of Human Dimensions



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