Analyzing the Impact of Hurricane Katrina from Social and Economic Perspectives

David (HyeonJong) Shin[1,2], Jose Pillich[2,3]
[1]The Bronx High School of Science, [2]CUNY CREST, [3]The City College of New York

Abstract

Hurricane Katrina could have been the ultimate proof of the devastation caused by the lack of preparation, awareness, and the poor infrastructure gradually established by social institutions. Besides the massive geographical destruction after the hurricane made landfall, the storm also demonstrated the ordeal to the public where the economically poor denizens of the low-elevated areas of the city were affected with the greatest intensity. To understand the flaws of the operations before and after the hurricane, this research examines the socioeconomic impact of Hurricane Katrina focused on the city of New Orleans where Katrina hit the hardest. Geospatial tools were utilized to examine the impact of the hurricane from a locational perspective. The software *Arcmap* was adopted to help display a variety of data which includes: the average rainfall, hurricane paths, digital elevation model (DEM) in Gulf Coast data and socioeconomic index. Given the city's inferior infrastructure, the analysis reveals that the storm's impact on the city was more taxing than expected. Moreover, the relief effort after the storm was further hampered due to the inability of municipal, state and federal agencies to provide sufficient aid.

Introduction

When hurricane Katrina made landfall in 2005, New Orleans was hit the hardest with 80% of its city flooding with water and more than 125 billion dollars in economic damage. Beside the property damage, the hurricane brought up a lot of social issues. There had been many reported instances of various government agencies failing to plan an appropriate relief operation and many statistical analyses proved that the city's poorly constructed infrastructure system harmed people of low income the most. New Orleans places 7th in the country in terms of poverty rates in the United States. About 27.9% of its citizens are living in poverty, compared to the national average of 12.4% and it also places 2nd in terms of homelessness rates in the country.
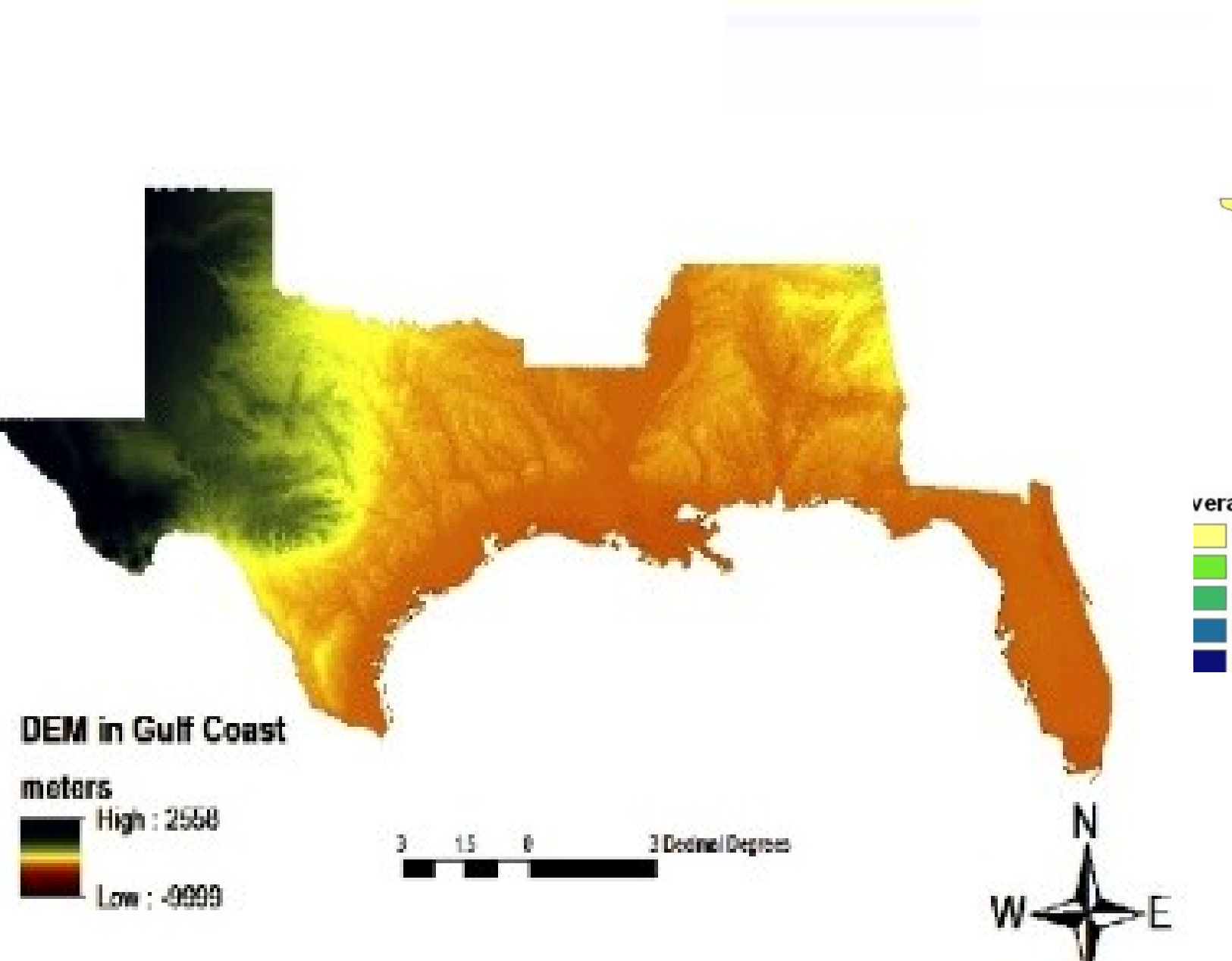
Method

Various data are retrieved from The Data Center Research Organization's website through the US Census Bureau and this data is used to measure the social vulnerability of each neighborhood in New Orleans. In calculating social vulnerability, the following are measured: elevation, categorical path of hurricane, correlation between the median household income and regional elevation, and correlation between percent of the population in poverty and the percent of the population without a vehicle. The elevation of the Gulf coast states, the categorical path of Katrina, and the median household income is color-coded on the GIS software. In calculating the correlations, scatter plot and bars graphs are used. In addition, various sources, including the New York Times and CNN, provided sufficient data to pinpoint the problematic
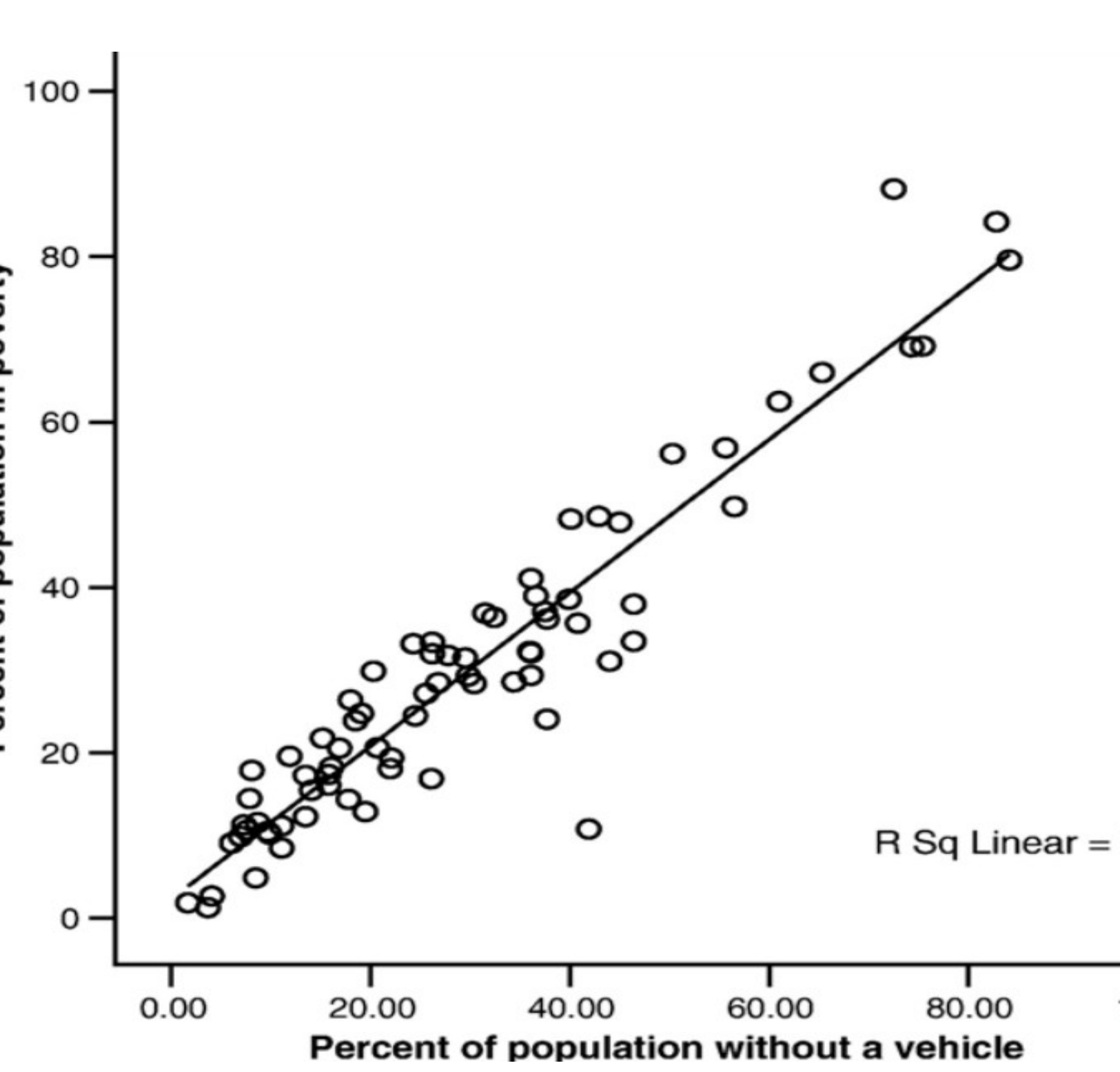
Data of Social Vulnerability

Different regions of New Orleans are color-coded by the median household income.
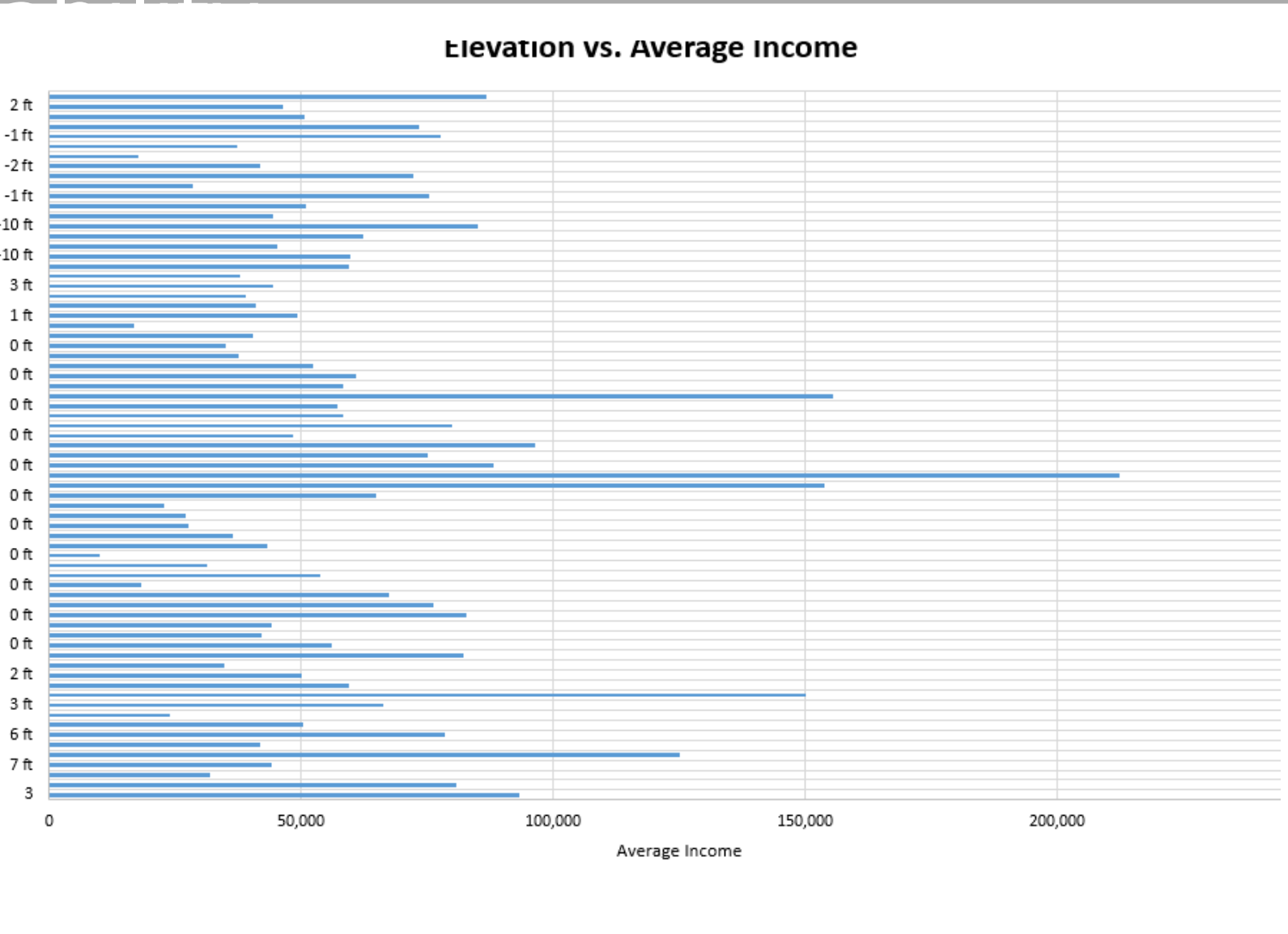

Graph of the average district elevation compared to the average household income in New Orleans Districts.

GIS map of digital elevation model in the Gulf Coast

The categorical path of Hurricane Katrina is traced

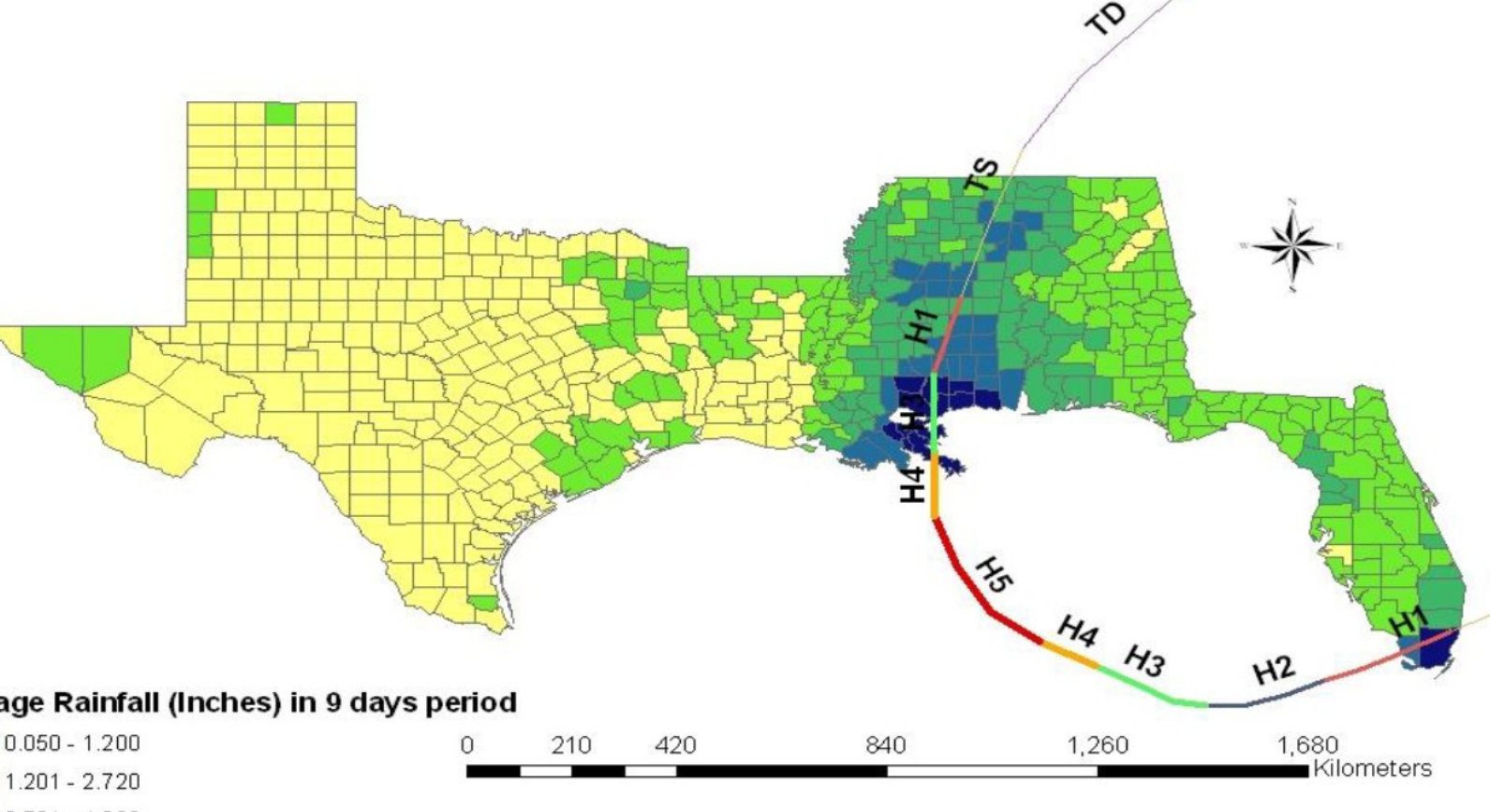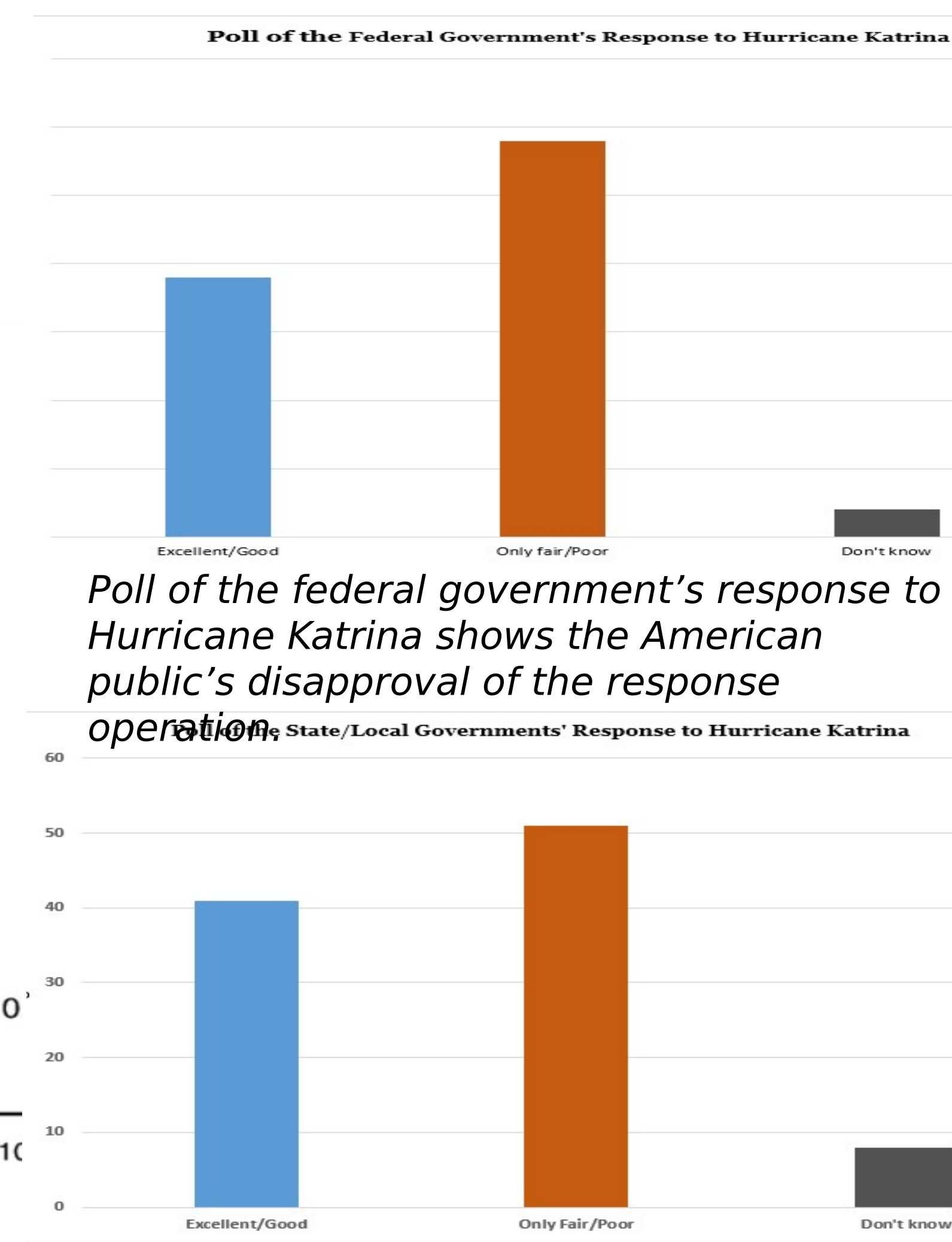*The scatter plot of correlation between percent of people in poverty and the percent of people without a vehicle*

Poll of the federal government's response to Hurricane Katrina shows the American public's disapproval of the response operation.

Poll of the state/local government's response to Hurricane Katrina shows that most of the American public believes state and local governments did a poor job

Important

FEMA: Only 500 buses were prepared while 2000 buses were required to evacuate everyone. The agency also refused the following: letting the Red Cross deliver food, utilizing Navy ships with 600 hospital beds on board, accepting Amtrak's help for evacuations, and accepting Wal-Mart supply trucks. The reason for the decline was that they weren't "federalized"

Public Transportation Although tolls were suspended on many connections to different cities, people were still expected to pay for commercial service in public transportation, which became a barrier for low-income and homeless residents. 27.3% of the population did not own vehicles in New Orleans, meaning more than 130,000 people did not potentially have access to vehicles.

Regional Protection: Levees: The levees made by the US Army Corps of Engineers were constructed for category 3 hurricanes, but Katrina was category 5, which is more destructive. Most of the levees ended up having breaches and becoming non-functional. Superdome: Superdome was the last resort of refugee built to support 15,000 people for 3 days. The officials ended up accepting more than 15,000 additional people.

Issues of Disaster-Planning and Relief Operation

Results

Graphing the scatter plot of the correlation between percent of people in poverty and the percent of people without a vehicle shows a positive correlation of 0.888 which implies that higher poverty rate directly relates to a higher amount of population without a vehicle and vice versa. Also, the line graph regarding the average district elevation compared to the average household income in the New Orleans Districts shows that the residents with the highest annual income lived near or at sea level as seen by the peak in the middle of the graph. Around 27.3% of the New Orleans residents did not own any vehicles and 27.9% were living in poverty prior to the arrival of Hurricane Katrina. The similar percentages of each aspect demonstrates a parallel effect on poverty rate-to-vehicle ownership correlation. During Katrina, these correlations were a huge setback for many low-income residents, because many of them lived in the dangerous, low-elevated neighborhoods and also did not own any vehicles. In the end, they were only left to take public transportation as the last resort of evacuation. Adding on, tolls were uplifted for many connection bridges to other cities, but people taking the public transportation had to pay for this service. In the end, the wealthier residents living in safer neighborhoods above sea level had the fastest resort of evacuation. Lastly through GIS, the median household income, the DEM, and the categorical path of Katrina was to be color-coded providing accurate visual representation. In addition, the issues of disaster planning and relief operation demonstrated the improper planning by FEMA and local government and failures of the local protections including the superdome and the levees.

Conclusion

Through this project, it could be seen that the destruction of Hurricane Katrina was mainly due to the flawed relief planning and operation by the local and federal government agencies and the failed constructions of the local levees. With these prevalent flaws, New Orleans was socially and geographically very vulnerable to the coming of one of the most destructive hurricanes in history.

Acknowledgement/References

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