



Image Source: ailantha.com

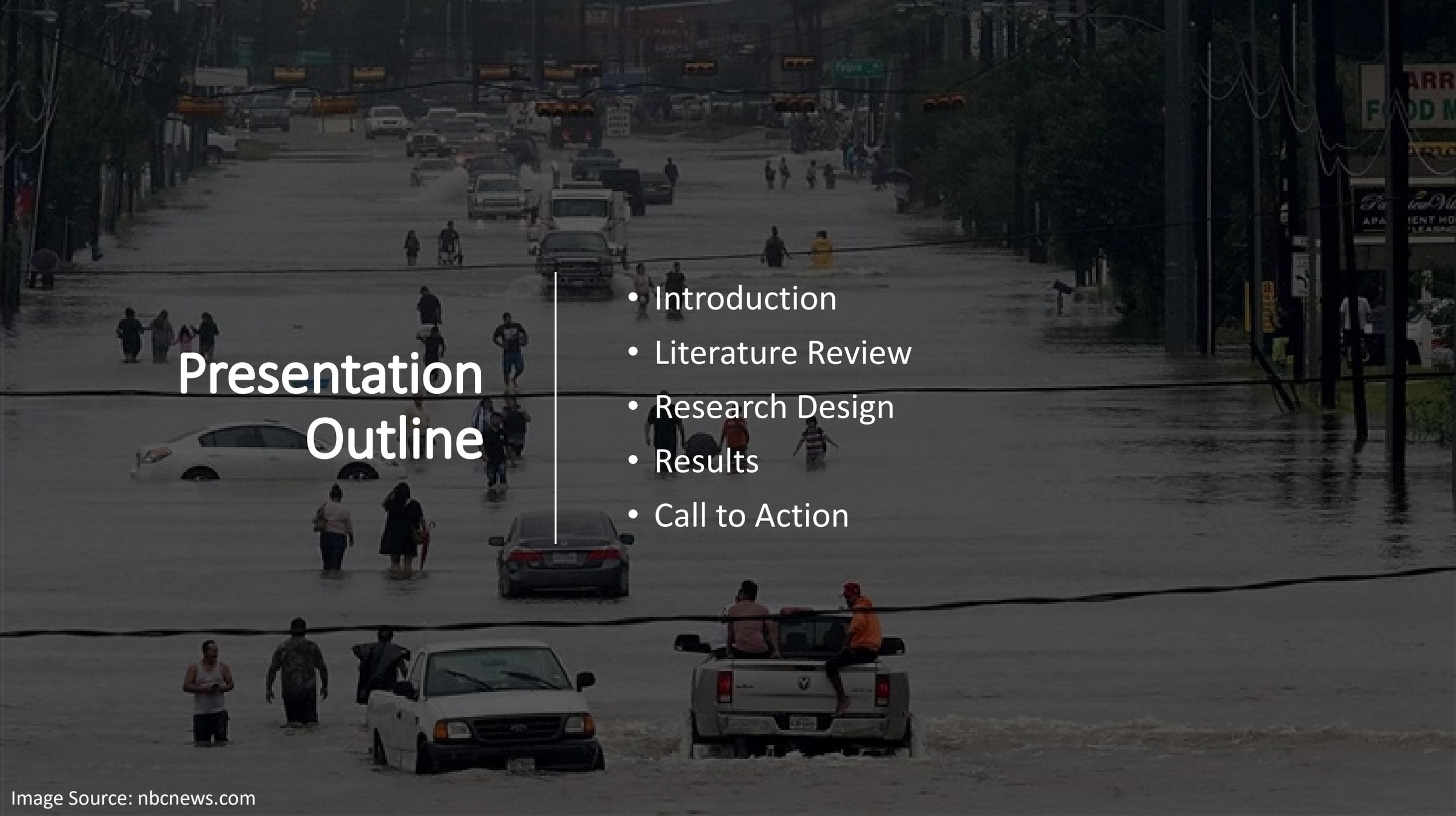


Image Source: TexasTribune.com

# THE HIDDEN FACES OF THE STORM

## A Story of Hurricane Harvey and the African American Community

Joy Semien M.S., Robert A. Catlin/David W. Long Fellow



# Presentation Outline

- Introduction
- Literature Review
- Research Design
- Results
- Call to Action

# U.S. Disasters Since 1980

- Storms have increased in frequency, duration, and intensity
- Over 230 weather and climate related disasters
- Disasters have cost over 1.5 trillion dollars

Source: Walsh, 2014; NOAA, 2018

Image Source: [Houston.culturemap.com](http://Houston.culturemap.com)



# 2017 Hurricane Season

- 17 named storms
- 10 hurricanes
- 6 major hurricanes (Cat. 3-5)
- Greatest US Impact
  - Hurricane Irma
  - Hurricane Maria
  - Hurricane Harvey
- 300 billion dollars in damages

Source: NOAA, 2018

Image Source: [Houston.culturemap.com](http://Houston.culturemap.com)



## Problem Statement

Natural disasters have long been a concern for communities, especially those of low income and of color.



Social Vulnerability



Disproportionate Impacts



Social Capital

# Hurricane Harvey

- Landed August 25, 2017
- Impacted Texas & Louisiana
- Category 4 hurricane
- 1,000-year storm
- Dropped 27- trillion gallons of water
- Destroyed over 40,000 homes
- Caused over \$150 billion in damages

Source: Allen, 2017; Zarracina, 2017  
Image Source: [insideclimateneeds.com](https://www.insideclimateneeds.com)



# Houston, TX Case Study Community

- Located 40 miles from the Gulf Coast
- Home to the Port of Houston and the Ship Channel
- Home to over two million people
- 88 superneighborhoods
- 6 Historic Wards

Source: [Houstontx.gov](http://Houstontx.gov)

Image Source: [insideclimateneews.com](http://insideclimateneews.com)



Harvey  
**14-15**  
trillion gallons  
(as of August 28)

5 trillion  
additional gallons  
forecast

Katrina  
**6.5**  
trillion  
gallons

HOUSTON  
DOWNTOWN

Vox

Image source: insideclimatenews.com

Image: Google Earth

The infographic features a blue background with a cityscape of Houston, TX. Two large blue circles are overlaid on the image. The top circle is larger and contains the text 'Harvey 14-15 trillion gallons (as of August 28)'. The bottom circle is smaller and contains the text 'Katrina 6.5 trillion gallons'. To the left of the bottom circle, a bracket indicates '5 trillion additional gallons forecast'. The text 'HOUSTON DOWNTOWN' is written in white at the bottom of the cityscape. The 'Vox' logo is in the bottom right corner. At the very bottom, there are two lines of small text: 'Image source: insideclimatenews.com' and 'Image: Google Earth'.

# Houston, TX Case Study Community

- Received 51.88 inches of rain or 1.2 trillion gallons of water
- Caused flooding in both flood prone and non flood prone areas
- Many of the bayous had to undergo controlled releases
- 68 direct deaths and 35 indirect deaths

Source: Blake, 2018; Long, 2017; FEMA, 2017  
Image source: insideclimatenews.com

## Research Question

Were African American communities underrepresented throughout the disaster cycle as compared to other ethnic groups?



Image source: [newsmax.com](https://www.newsmax.com)

# Research Design

## Mixed Method

- Quantitative
- Qualitative

## Three Phases

1. Mapping via GIS
2. Content Analysis
3. Expert Telephone interviews

Image Source: [www.insideclimateneews.com](http://www.insideclimateneews.com)





# Phase 1: GIS

## 1. Unit of Analysis:

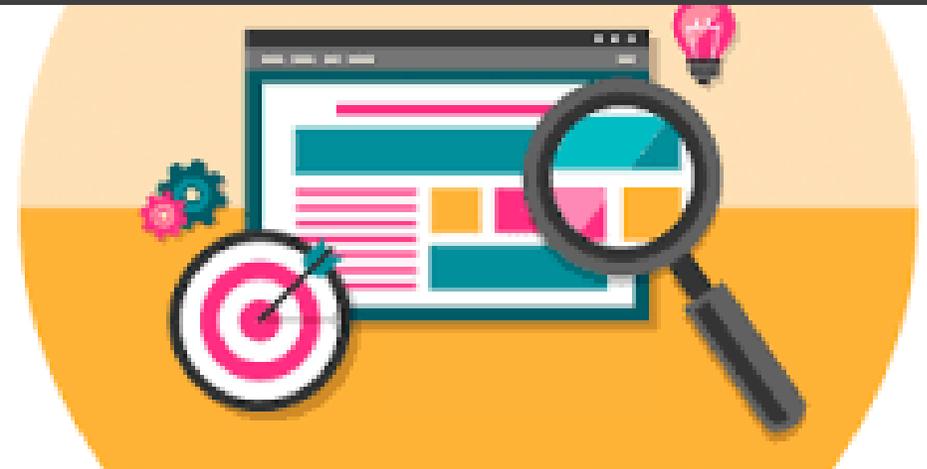
- Community Tabulation Areas (CTA)

## 2. Data Source:

- Kinder Institute – Rice University
- Houston Open Data: <http://data.houstontx.gov/>

## 3. Purpose:

- Determine numbers of homes affected
- Determine number of African Americans affected

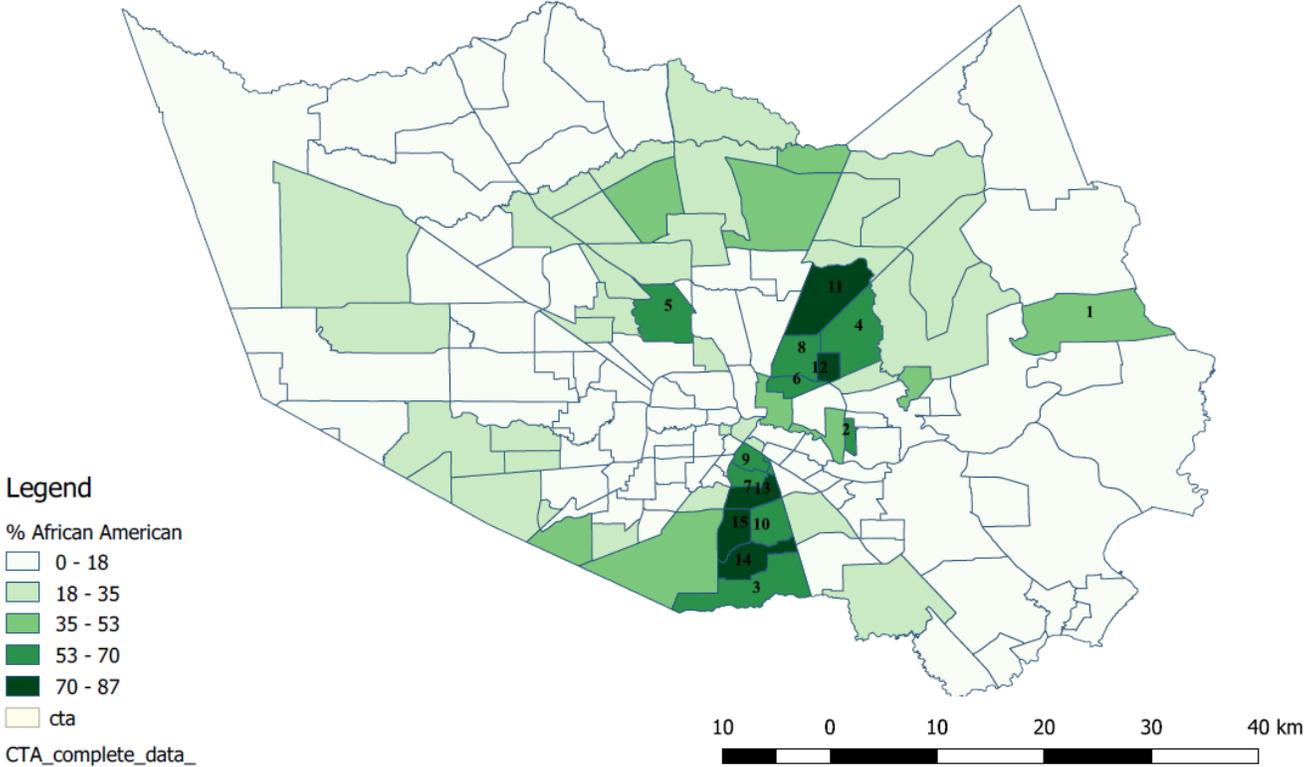


# GIS Results

This first map uses Census level population data to illustrate the locations that contain the highest percentage of African Americans within the Houston CTA.

The darker the color the higher the percent of African Americans.

Percentage of African American's in the Houston Community Tabulation Area



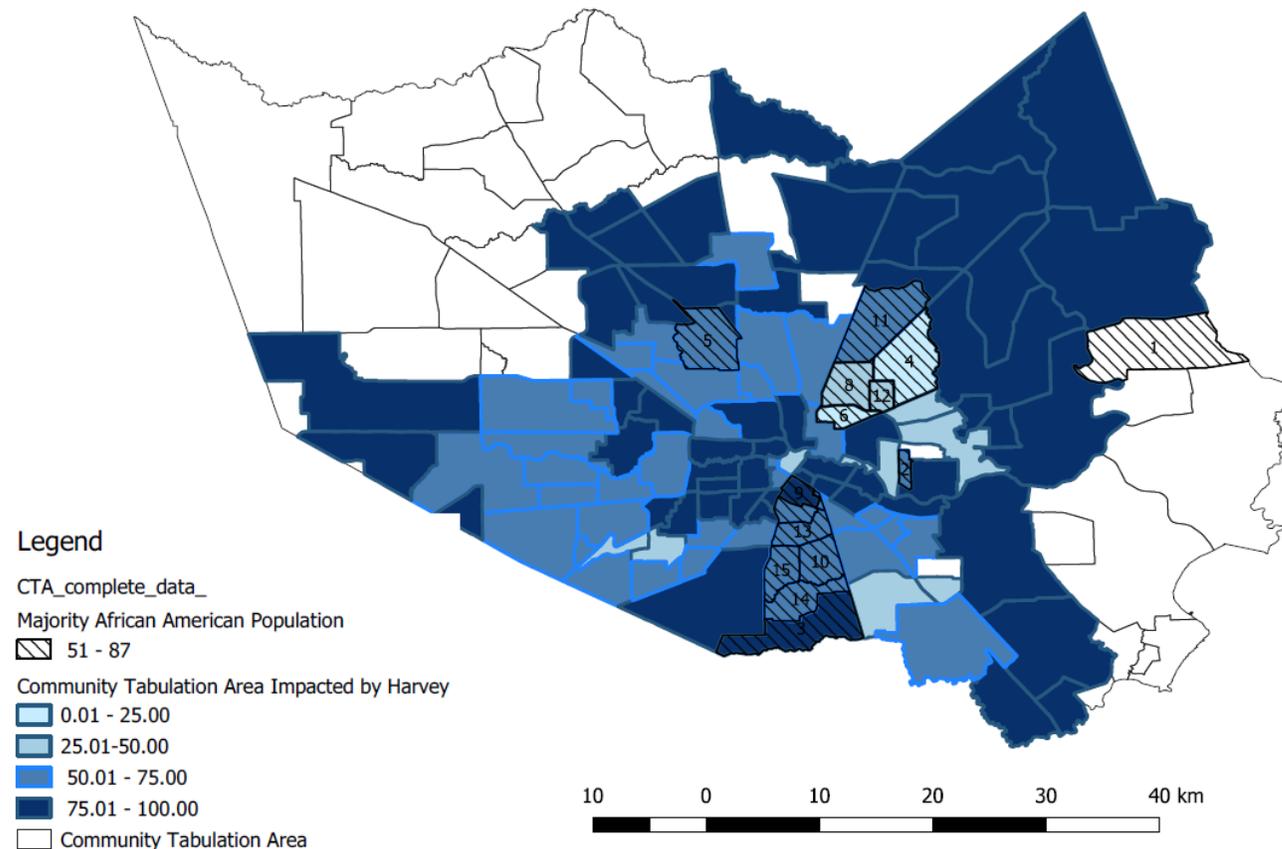
# GIS Results

The second map uses the spatial data collected from Rice and the City of Houston to illustrate the CTA's that were greatly impacted by Hurricane Harvey, inclusive of the top 15 African American neighborhoods.

The darker the color the higher the percent impact.

UA: housing units.

Community Tabulation Areas Impacted by Hurricane Harvey



# GIS Results

<b>Table 1: Highest Percent African American Neighborhoods in Houston's Community Tabulation Area's</b>			
<b>Neighborhood Name</b>	<b>Percent African American</b>	<b>Number of Units Impacted by Harvey</b>	<b>Percent of Units Impacted by Harvey</b>
Barrett	51.05	N/A	N/A
Clinton Park Tri-Community	53.29	319	67%
<b>Minnetex</b>	56.03	846	<b>84%</b>
East Houston	61.03	5,459	24%
<b>Acres Home</b>	61.2	4,536	<b>68%</b>
Kashmere Gardens	61.65	3,672	21%
MacGregor	62.41	3,043	54%
Trinity / Houston Gardens	64.84	3,954	46%
<b>Third Ward</b>	66.96	1,286	<b>77%</b>
South Park	68.72	3,794	63%
East Little York / Homestead	70.71	4,120	54%
Settegast	75.01	1,004	47%
OST / South Union	76.86	4,236	52%
South Acres / Crestmont Park	83.99	2,782	62%

# Key Takeaways

- There were no major correlations between predominate African American neighborhoods and neighborhoods comprised of other ethnicities
- There were no statistical significance shown between predominate African American neighborhoods and neighborhoods comprised of other ethnicities





# Phase 2: Content Analysis

## 1. Unit of Analysis:

1. Phrases
2. Words

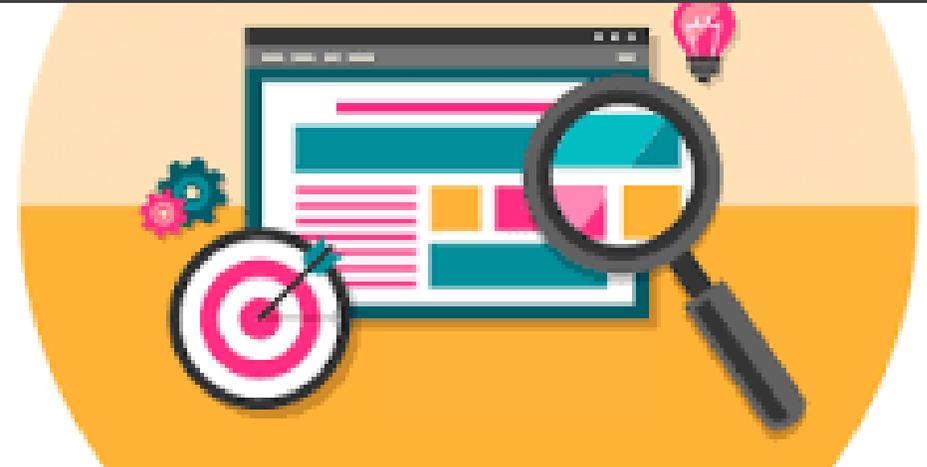
## 2. Data Source:

- New York Times (NYT)
  - Cable News Network (CNN)
  - Texas Tribune (TT)
  - Houston Chronicle (HC)
- } National Newspapers
- } Local Newspapers

## 3. Method:

- Performed a Count of 144 Articles
- Record: Google Forms

## 4. Purpose: Did the media highlight African American neighborhoods



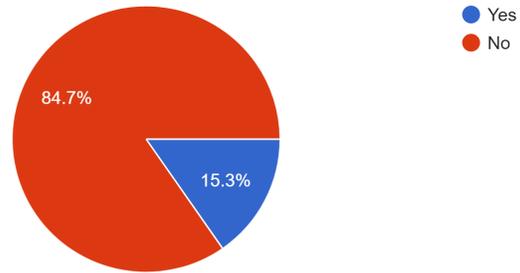
# Content Analysis Results



- Neighborhoods were mentioned 144 times
  - 46% mentioned African American neighborhoods
  - 54% mentioned other neighborhoods
- Mapping Correlation
  - East Houston (7 times)
  - Acres Homes (1 time)
  - Kashmere Gardens (2 time)

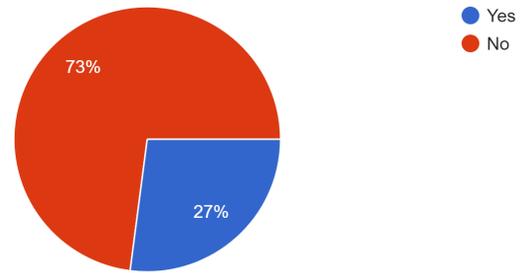
Did the picture have majority black residents?

124 responses



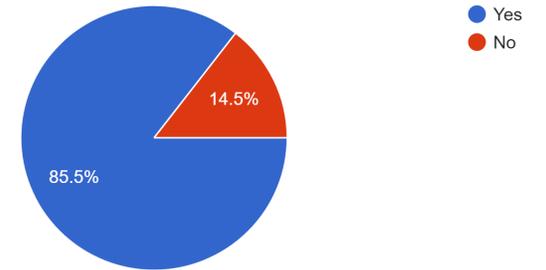
Did the picture have flooded streets

122 responses



Were there any visuals shown in the article?

124 responses



# Content Analysis Results

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# Key Takeaways

- African American neighborhoods were mentioned less than neighborhoods comprised of other ethnicities.
- African American images were used in multiple articles on variant topics related to Harvey





# Phase 3: Expert Telephone Interviews

## 1. Recruitment Method:

- Self-selection
- Snowball
- Convenience Sampling

## 2. About the Interview Questions:

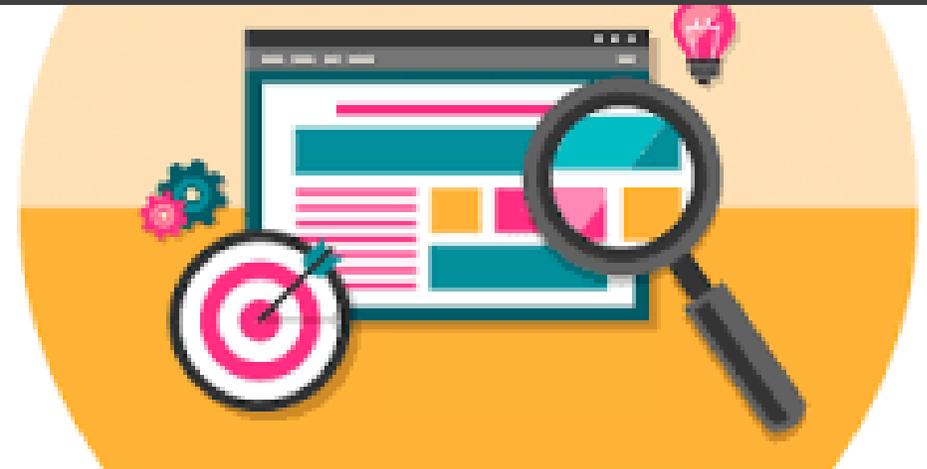
- Twelve questions
- lasting about 15 minutes

## 3. Data Source:

- African American Community Leaders in Houston
- Representing 10 neighborhoods

## 4. Purpose:

- The interview asked questions in regards to the communities' disaster preparedness, response, and recovery processes.



Interviews:  
Preparedness



***Before Hurricane Harvey made landfall, were there any hurricane preparedness workshops or supplies distributed for the community?***

60% of respondents said there were no preparedness trainings or supplies

33% of respondents said there were trainings and supplies

7% of respondents choose not to answer or did not know the answer

Interviews:  
Response



***After Hurricane Harvey made landfall were any families rescued by the National Guard, fire trucks, police etc?***

64% of the neighborhoods in which participants represented had to be evacuated by the national guard, fire truck, or police.



***If so how long did the response take (i.e. a few hours, a few days)?***

Response took between a few hours and a few days.

Interviews:  
Response



***Were any families rescued by good Samaritans (other citizens, neighbors, family members etc.)?***

13 out of 15 people answered this question and of those (100%) state that their neighborhoods had to be evacuated by good Samaritans.



***How long did the response take (i.e. a few hours, a few days)?***

Response took a few hours.

Interviews:  
Recovery



***Estimate the percent of homes that were damaged by Hurricane Harvey.***

50% to 100% as an estimate for the percent of homes that were damaged by Hurricane Harvey within their neighborhood.



***Estimate the percent of homes that STILL need repairs.***

58% of the homes in their neighborhoods still need repairs.

Interviews:  
Recovery



***What types of property repairs are still needed within the community?***

Aesthetics, roofing, structural support, mold remediation, gutting, sheetrock, patching, floors, walls, foundation, elevation work, complete demolition, and framing.



***On a scale 1 to 5 (one being the lowest five being the highest) how severe were the damages of homes within the community.***

Respondents mostly responded with a 4 stating that the homes in their subdivision received severe damage.

## Interviews: Recovery



***Estimate the percent of homes damaged by Hurricane Harvey that were occupied by a child(ren) between 0 to 18 years old or elderly person(s), over 65 years old.***

55% of homes damaged were occupied by the elderly population

56% of homes damaged were occupied by children

53% still need repairs.



***Did Hurricane Harvey affect any major infrastructure within the community? Does the infrastructure still need repair?***

All respondents said yes

i.e. Buckling roads, sidewalks, drainage systems, and bayou remediation as infrastructure that was either damaged or further exasperated during Hurricane Harvey.

## Interviews: Recovery



***Did Hurricane Harvey affect the communities' ability to access fresh fruits and vegetables?***

86% of respondents stated that food accessibility was an issue before and after Hurricane Harvey made landfall

89% of business returned to the neighborhood

Return of business took upwards of 6 months.



***On average what percent of the homes affected by Hurricane Harvey had disaster assistance rebuilding their homes?***

The responses varied

# Key Takeaways

- Hurricane Harvey exasperated the already present issues within the African American communities within Houston





Image Source: patch.com

## Limitations:

- Time period
- Secondary data sources rather than primary data
- Content analysis is informative not inferential
- Interviews were not random sample
- Limited participants



Image Source: patch.com

## Reliability and Validity:

- Second coder for content analysis
- Contacted hazard specialist
- Interviewed community leaders

# Call to Action

- Hurricane Harvey was a storm that had no respect for sociodemographic background
- Equitable outcomes are linked to the development of mitigation, remediation of housing and infrastructure
- Disasters will continue to impact these communities at disproportionately rates until the problems within these communities are resolved



# Acknowledgements

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