

## Introduction

- The Federal Emergency Management Agency's (FEMA) preliminary Flood Insurance Risk Map (FIRM) for Orleans Parish will become effective on September 30<sup>th</sup>, 2016 replacing the outdated effective map of 1984 (See Figure 1)
- The FIRM is mainly used to determine insurance rates for the national flood insurance program (NFIP), and it is relevant for flood risk management and public policy
- There has been controversy over whether the new FIRM accurately depicts risk, and what it means for Orleans Parish
- The effects of Hurricane Katrina on the people of Orleans illustrate the importance of understanding how socially vulnerable people are affected by flood risk

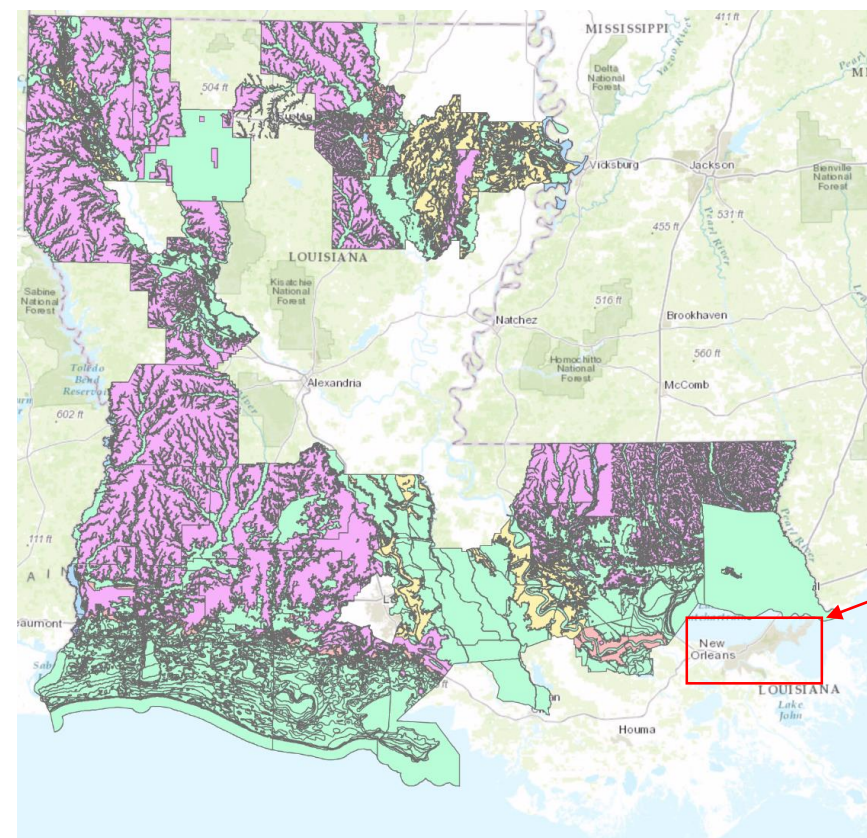


Figure 1: 1984 Louisiana FIRM



Image 1: Houses flood after Katrina



Figure 2: 1984 Orleans Parish FIRM



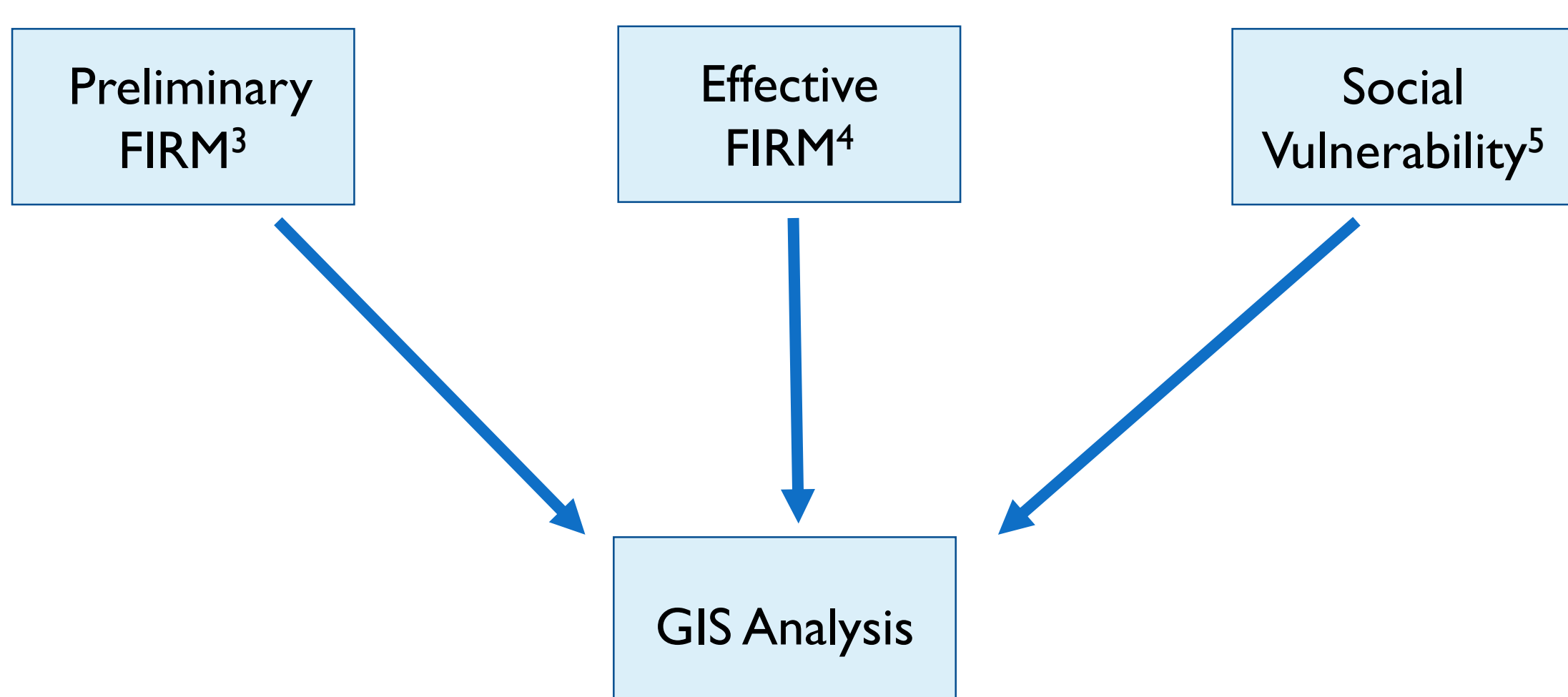
Image 2- Frustration over FEMA after Katrina

## Objectives

- Compare effective map to preliminary map in order to assess change in size and locations of flood plains
- Compare social vulnerability map with new FEMA map to interpret how socially vulnerable people may be affected by FIRM
- Assess accessibility of FEMA's flood map and social vulnerability data

## Methods

- We used Geographic Information System (GIS), ArcMap 10.3.1, in order to analyze the changes in flood plain zones and to compare these zones with social vulnerability (SV) maps
- We combined query results to examine relationships among the FIRMS and SV Maps
- We used intersect methods to find areas of commonalities and difference within the three different datasets



## Results (GIS Analysis)

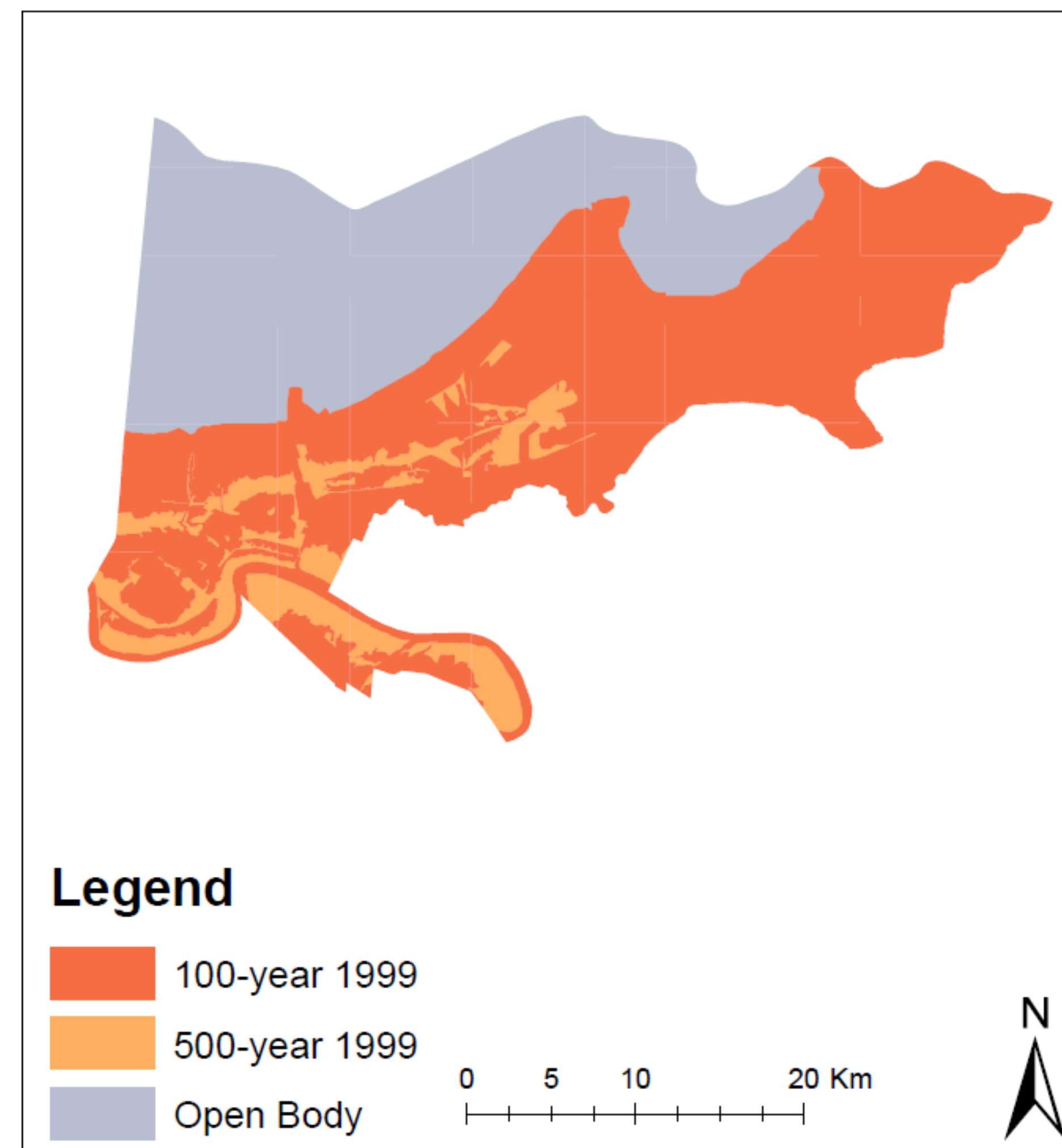


Figure 3 – 1999 Flood Risk Map

- A large proportion of the map is categorized as 100-year flood
- Only two categories present
- Not a great deal of detail

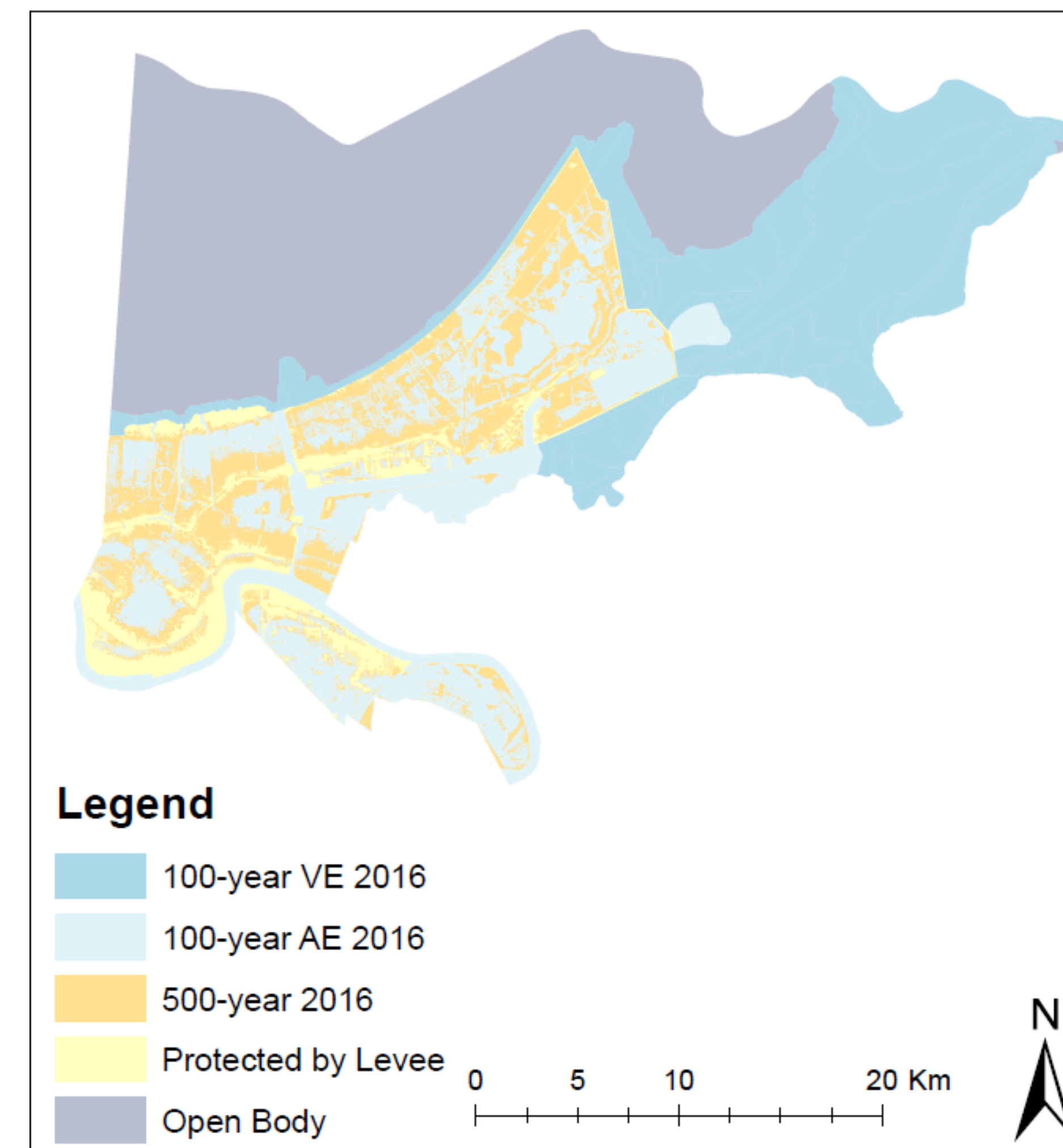


Figure 4 - 2016 Preliminary Flood Risk Insurance Map

- Difference between 100-year flood
- Four categories present
- Greater detail than before

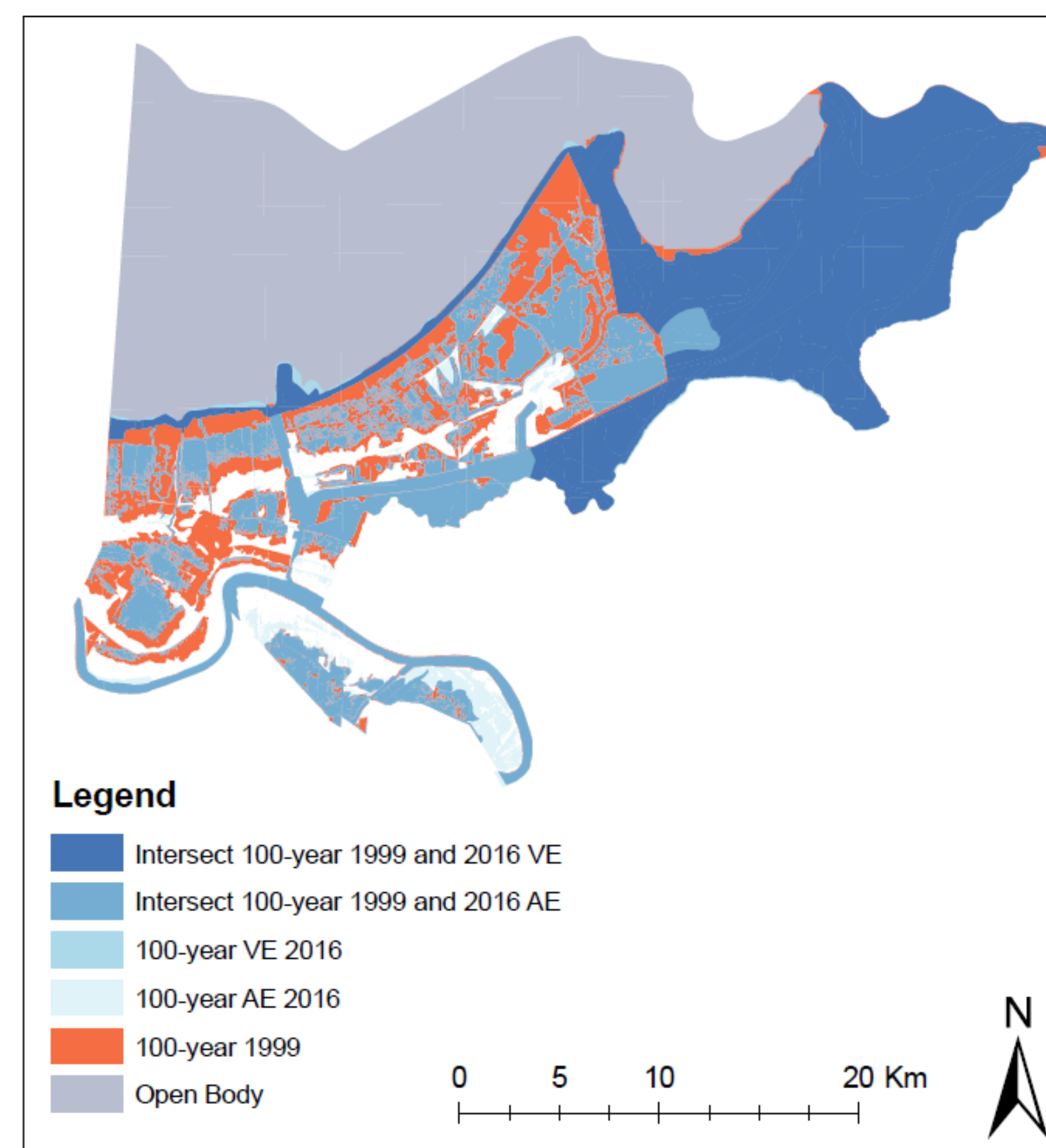


Figure 5 – 100-year Intersect between 1999 and 2016

- Large area categorized as 100-year in 1999 is not in 2016
- Small areas that did not exist in 1999 map are present in 2016
- There are commonalities of 100-year flood especially in the coast

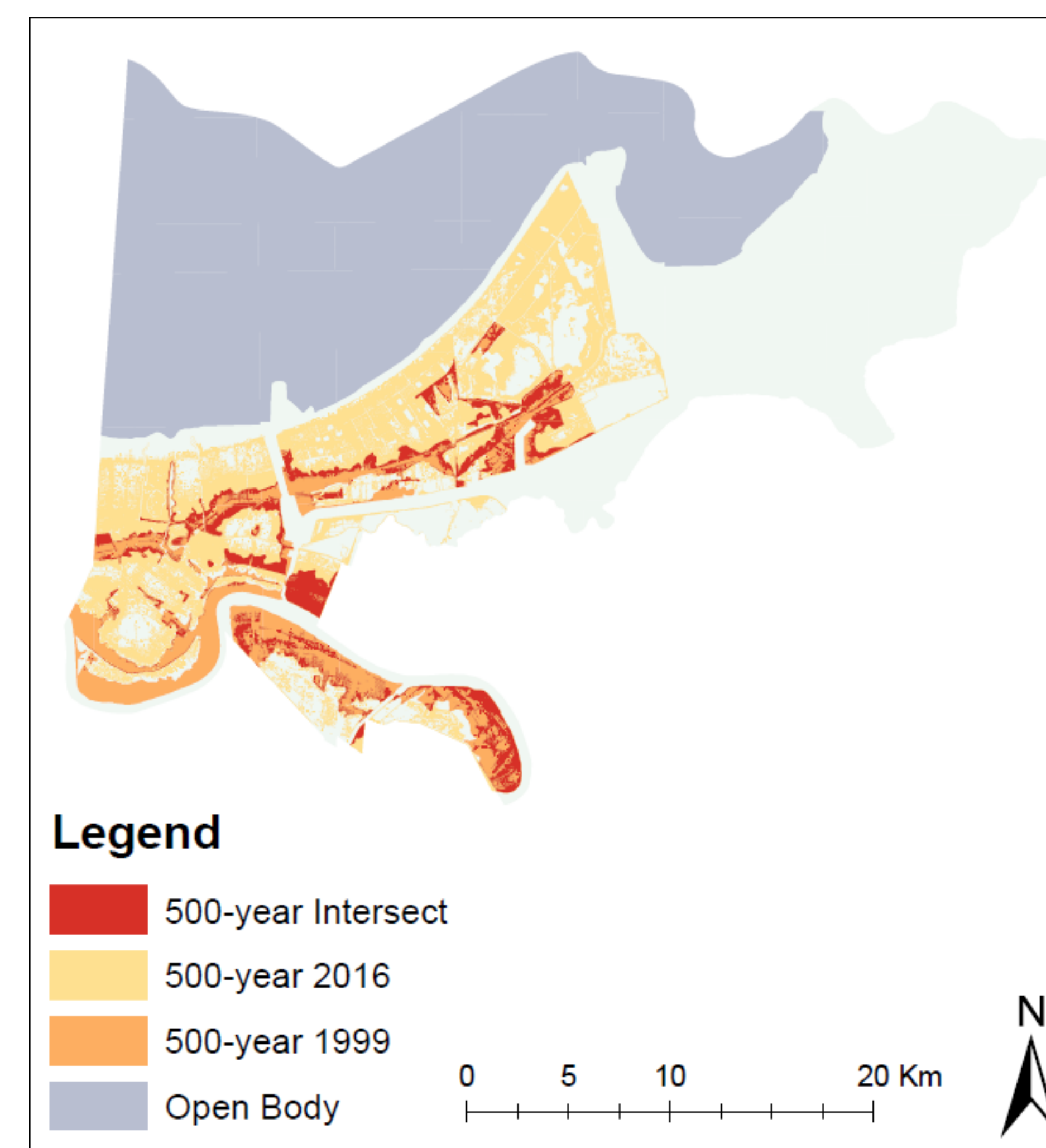


Figure 6 – 500-year Intersect between 1999 and 2016

- Only small area of commonality in the 500-year across the two years
- Large area categorized as 500-year in 2016 was not in 1999
- There are changes to what was 500-year in 1999 in 2016 map

## Discussion

- The 100-year and 500-year floodplains in 1999 have decreased size in 2016
- 100-year floodplains in 1999 are categorized as AE and VE in 2016 and some areas have changed to a 500-year floodplain
- A majority of 500-year floodplains in 1999 are categorized as 'protected by levee' in 2016

### Take-Away

- Overall, the new FIRM indicates that a larger amount of area in Orleans parish is less prone to flooding than before
- However, FEMA does not take into account climate change, specifically sea level rise, when predicting the risk of flooding
- Additionally, the FIRM assumes that the levee system is sound

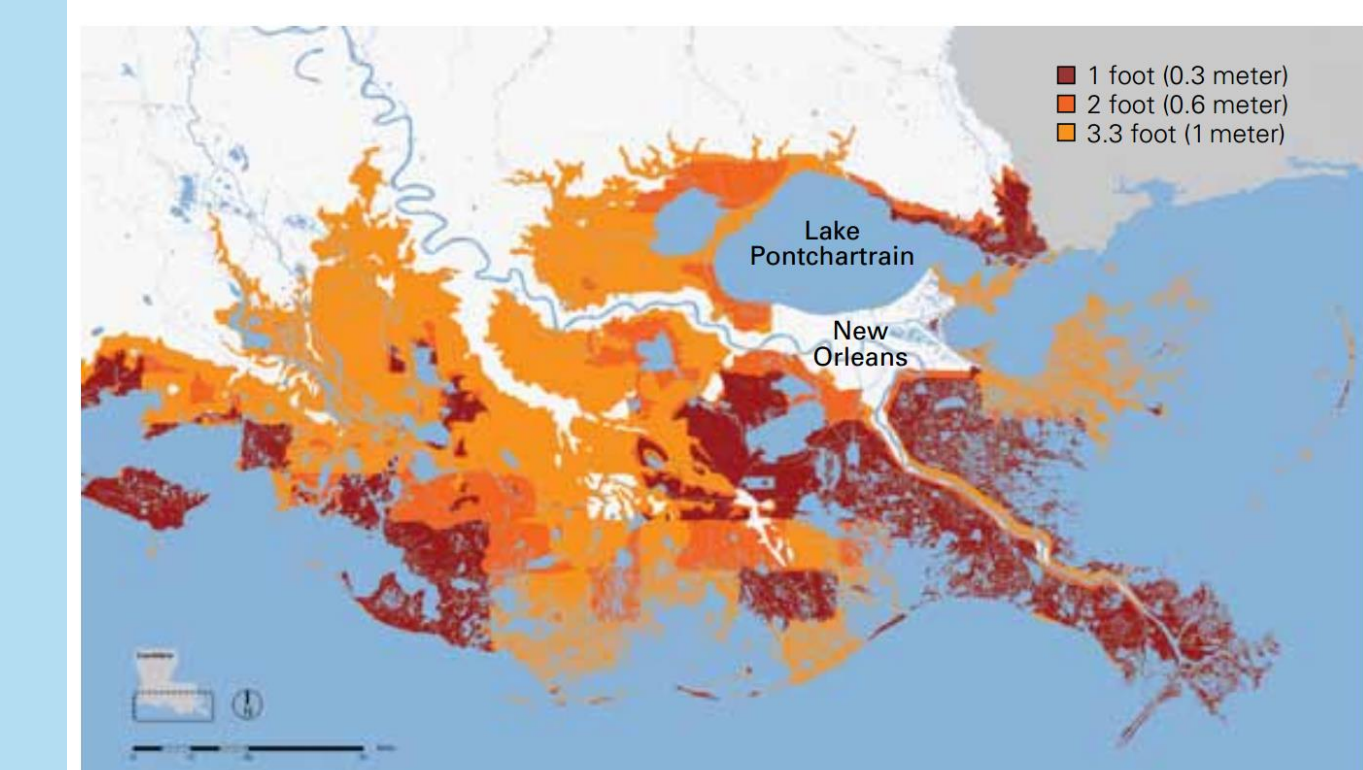


Image 3 – depicts 1 to 3.3 feet relative sea level rise predictions by 2100 for New Orleans



Image 4 – Levee breaking and flooding Orleans during Katrina

- When trying to access the data, we ran into many obstacles
  - FEMA does not provide the digitized 1984 FIRM
  - Difficulty receiving requested information from FEMA
  - FEMA was unable to provide SV data from their online SV Map

## Next Steps

- Quantitative analysis of GIS data
- Expand on social vulnerability characteristics and continue to investigate it in relation to flood plain
- Create a data repository to improve accessibility

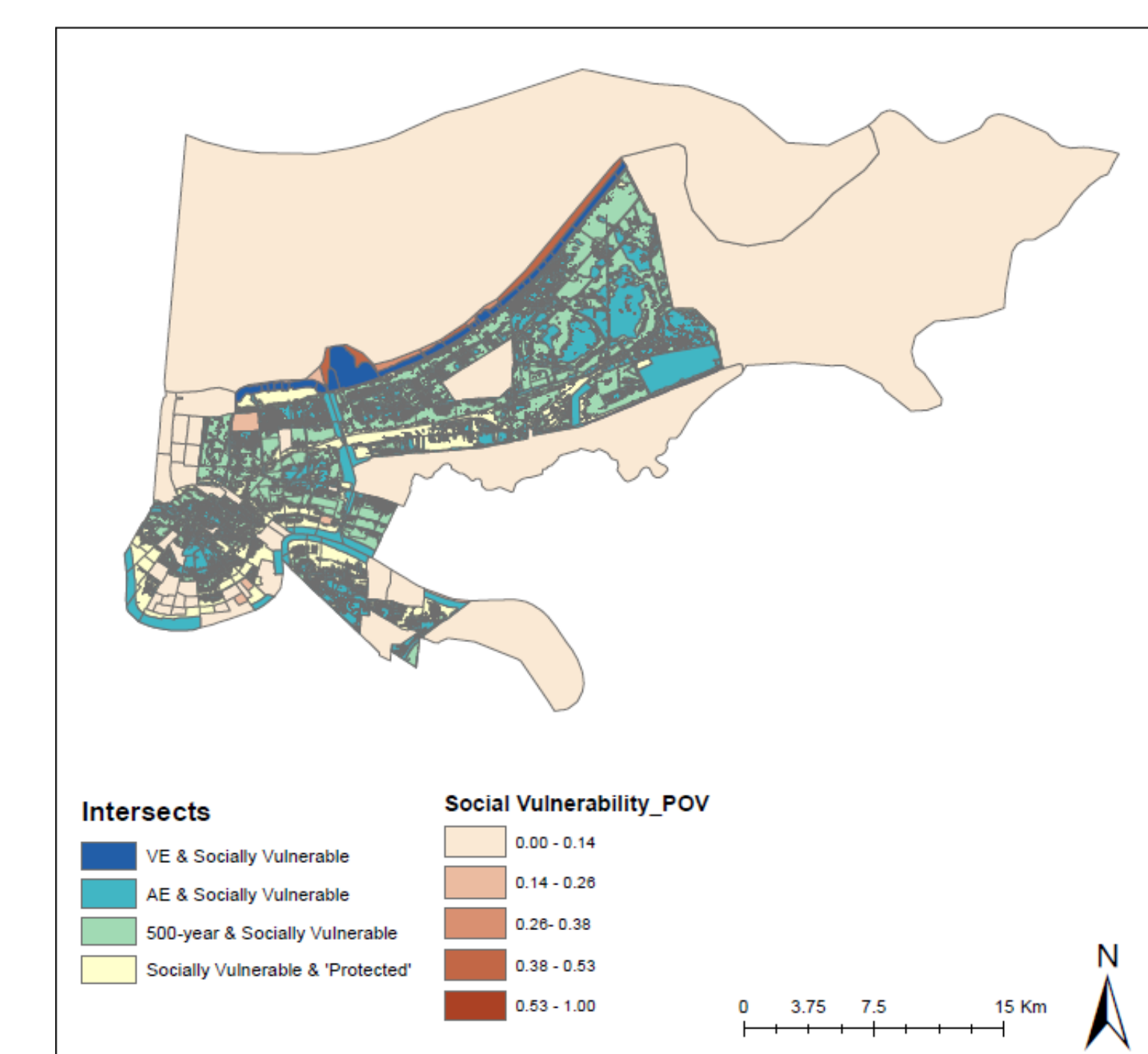


Figure 7 – SV and 2016 FIRM Intersect

Shows that a majority of socially vulnerable populations in Orleans parish lie on the 100 and 500 floodplains whereas a small proportion lie within the 'protected' areas.

## Acknowledgements

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