

Determine suitable cooling center locations for heatwave adaptation by analyzing the vulnerable population with AHP and GIS: A case study in the City of Mission, KS



Yurika Kato, Department of Geography and Atmospheric Science University of Kansas

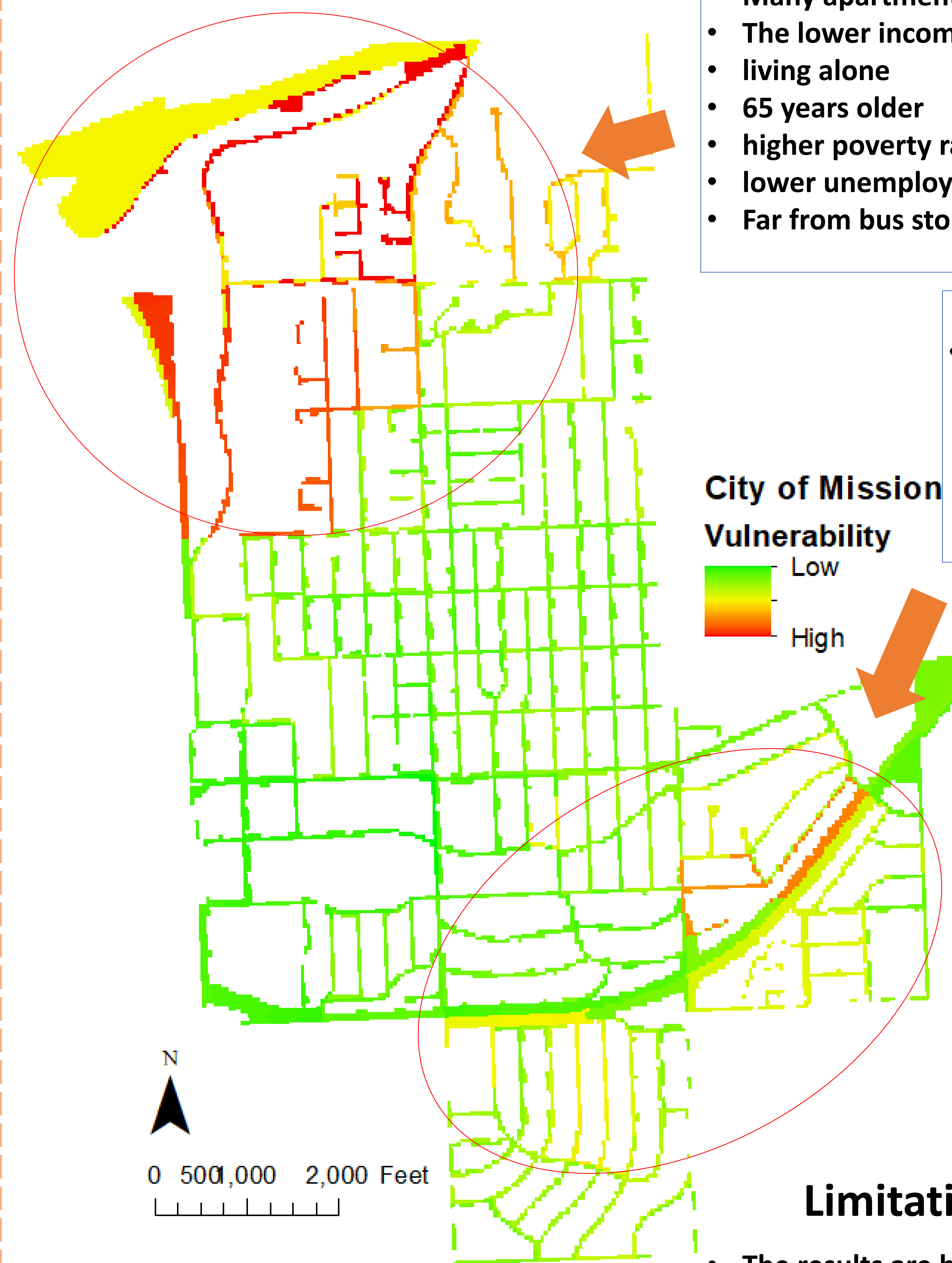
Introduction

- 2 heat-related deaths in KC in 2018
- Hot days (100 degrees +) will increase by 4 times in 2050.
- Kansas City is ranked 5 out of 25 U.S. cities hardest hit climate change areas
- Regardless of the high potential heat hazards, Kansas state and cities have not been developed climate change adaptation plans.
- The objective of this project is to determine a suitable cooling center location with the consideration of vulnerable population in a small city



Fig 1. Study area

Result



- Many apartment complexes concentrated in this area
- The lower income
- living alone
- 65 years older
- higher poverty rate
- lower unemployment rate
- Far from bus stops and the cooling center

- senior housing/apartment complex named Bickford at Mission Spring. This senior living made the area concentration of the population 65 years older plus alone.

Materials and Methods

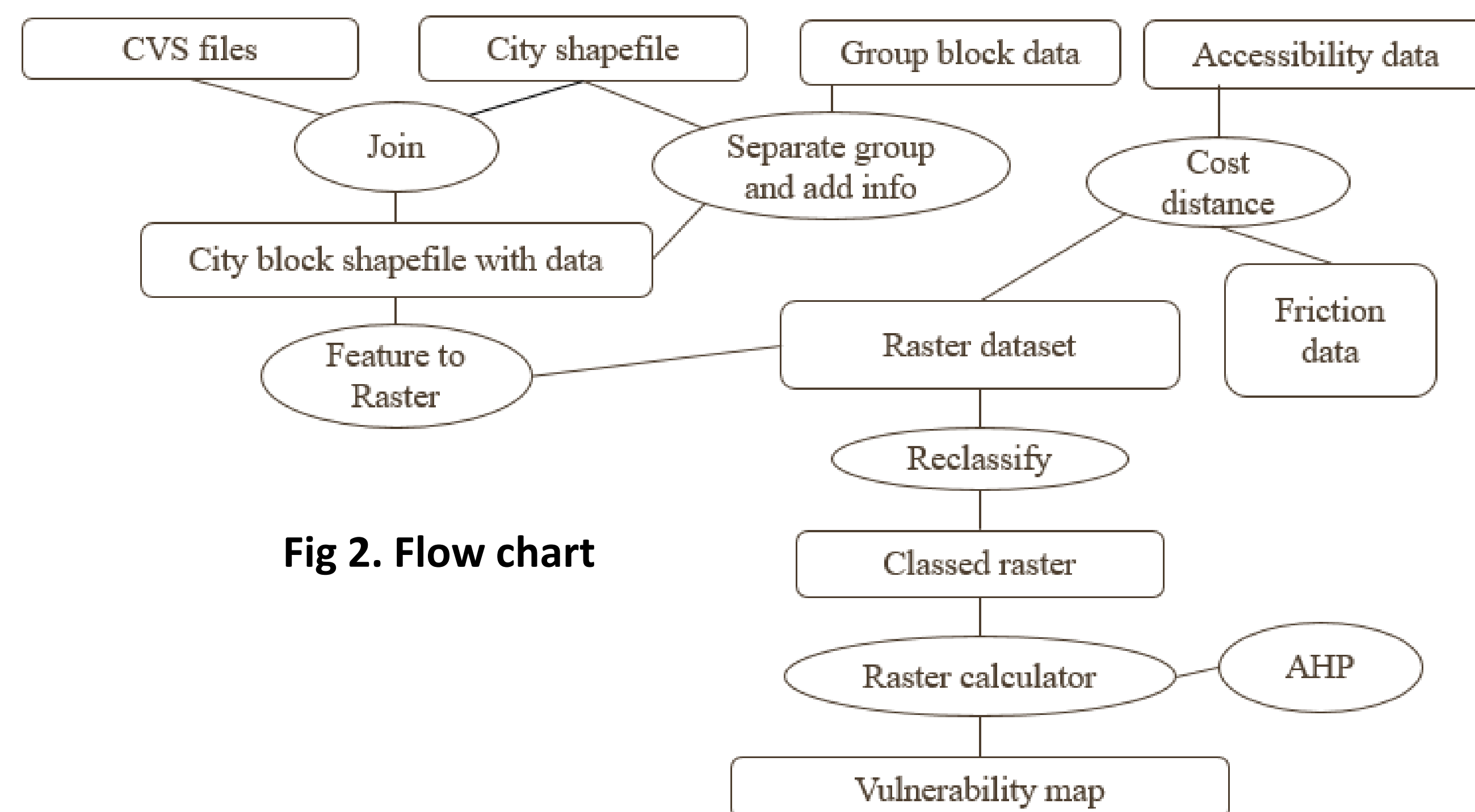


Fig 2. Flow chart

Table 1. Data used to determine vulnerable location

Name	Description	Size	Format
Demographic dataset			
65 years older (P25)	Households with one or more people 65 years and over	Block	Polygon
65 years older living alone (P34)	65 years and over householder living alone	Block	Polygon
Alone (P30)	1-person household	Block	Polygon
Income	Median income in group block	Block group	Polygon
Unemployed	Unemployment rate by group block	Block group	Polygon
Poverty	Poverty rate by group block	Block group	Polygon
Accessibility dataset			
Bus stops	Bus stops of bus routes (401, 402, 403, 435) that can take to community center directly	N/A	Point
Community center	Location of Sylvester Powell Jr. Community Center	N/A	Polygon

Conclusions

- ❑ The northwest corner is highly vulnerable, so cooling centers are recommended to establish in this area. Any facilities could be cooling center including businesses.
- ❑ The southwest corner is moderately vulnerable. Senior living might already have adaptation measures to heat. However, maybe a shuttle bus to the cooling center would be helpful to the region

Limitations

- The results are highly dependent on weight and class assigned.
- Cooling center out side of the city was not considered
- Data availability – e.g. education level

Email- yurika.kato@ku.edu

Fig 3. Vulnerability map in the City of Mission