

# Extreme Storm Vulnerability in Cape Cod

## Vulnerability Assessments

### An Overview

Hazard assessments are common and important in areas that are susceptible to natural disasters by virtue of their environment.



Vulnerability analysis answers the following questions:

- 1) Which social demographics are most vulnerable during a disaster?
- 2) Which areas are geographically furthest from emergency services that are important during a disaster?
- 3) What are the greatest environmental hazards in a community?

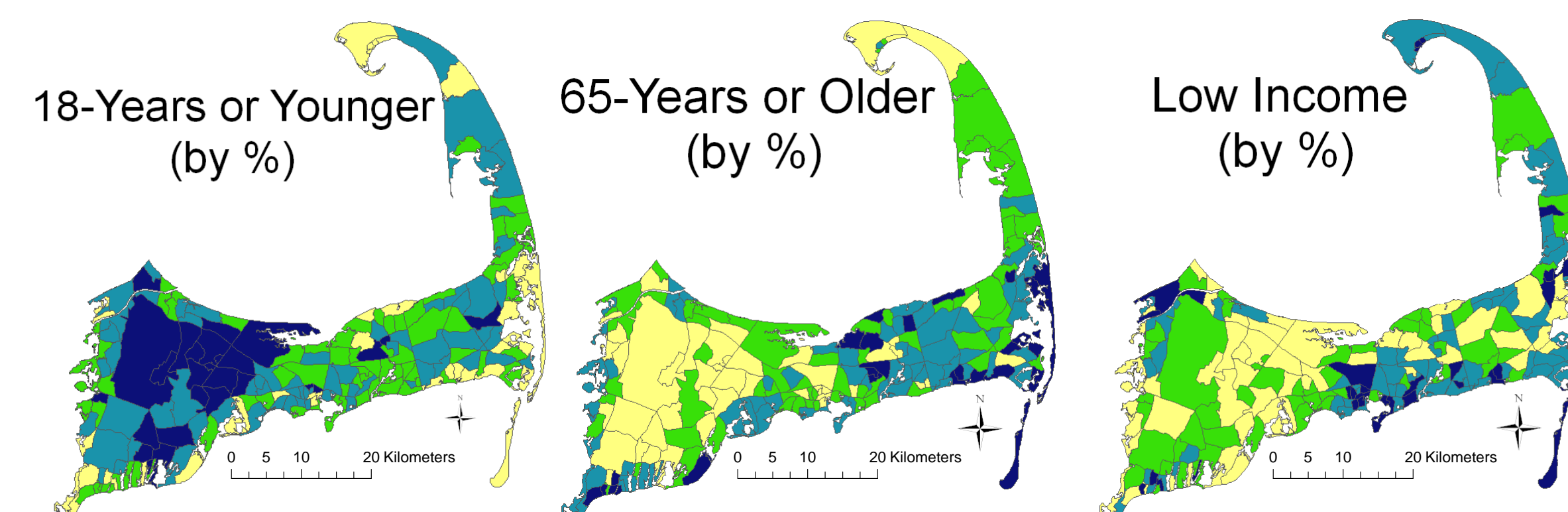
This poster focuses specifically on Cape Cod, MA. As water levels rise and weather conditions become more variable, islands and peninsulas will be at the greatest risk to water induced disasters like hurricanes. A clear, visual map of vulnerable pockets in Cape Cod can



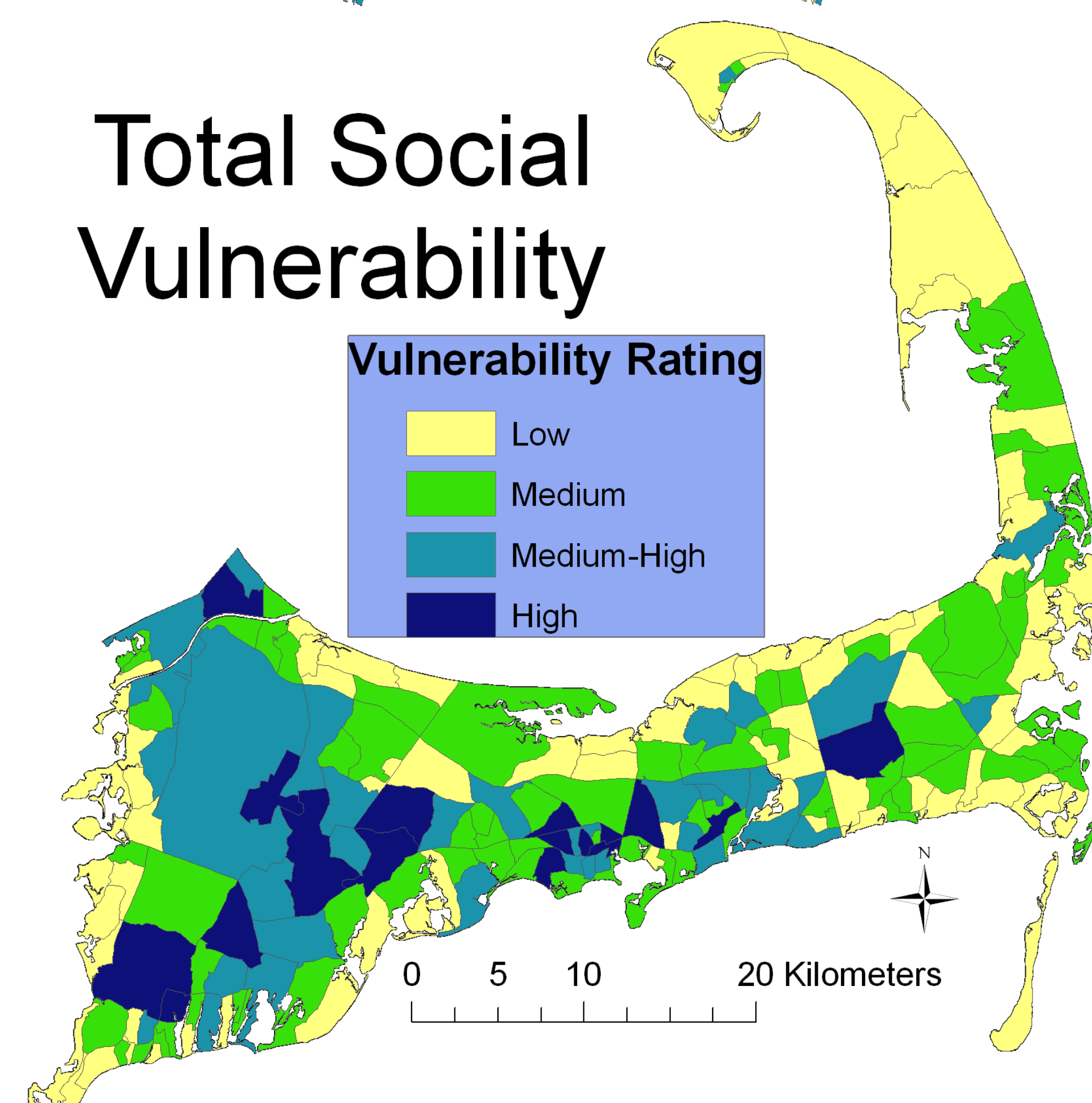
be used by city planners to prepare before a storm and mitigate some of the worst effects.

*Images from flickr.com*

## Social Vulnerability Inputs



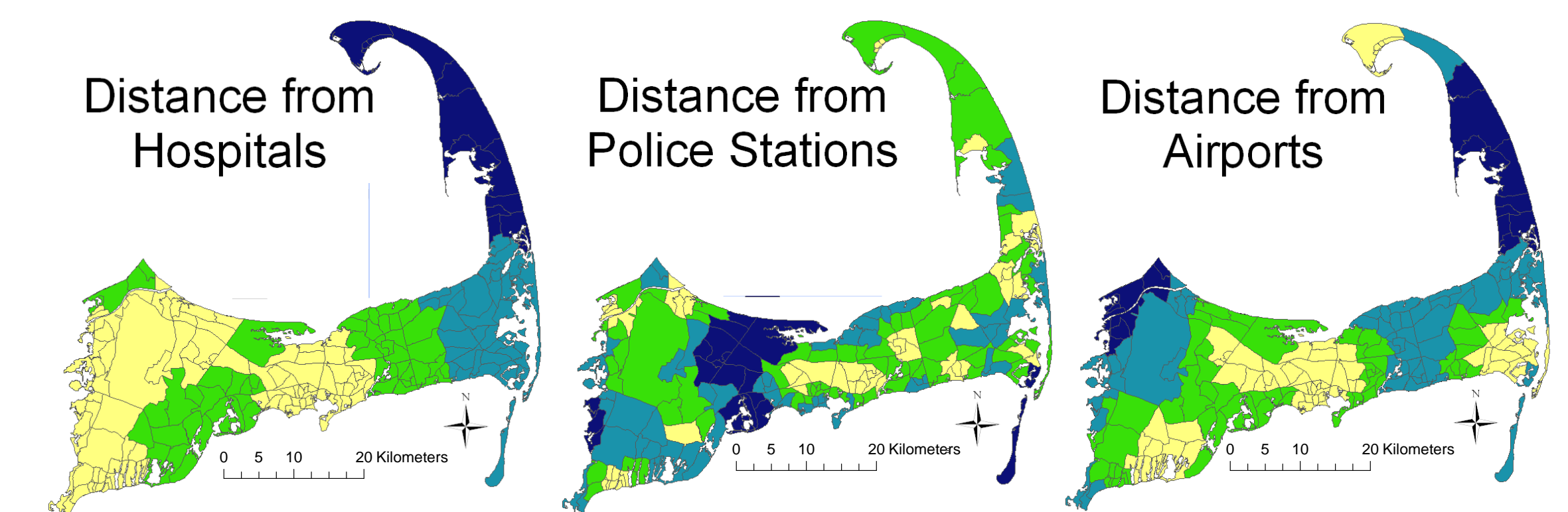
## Total Social Vulnerability



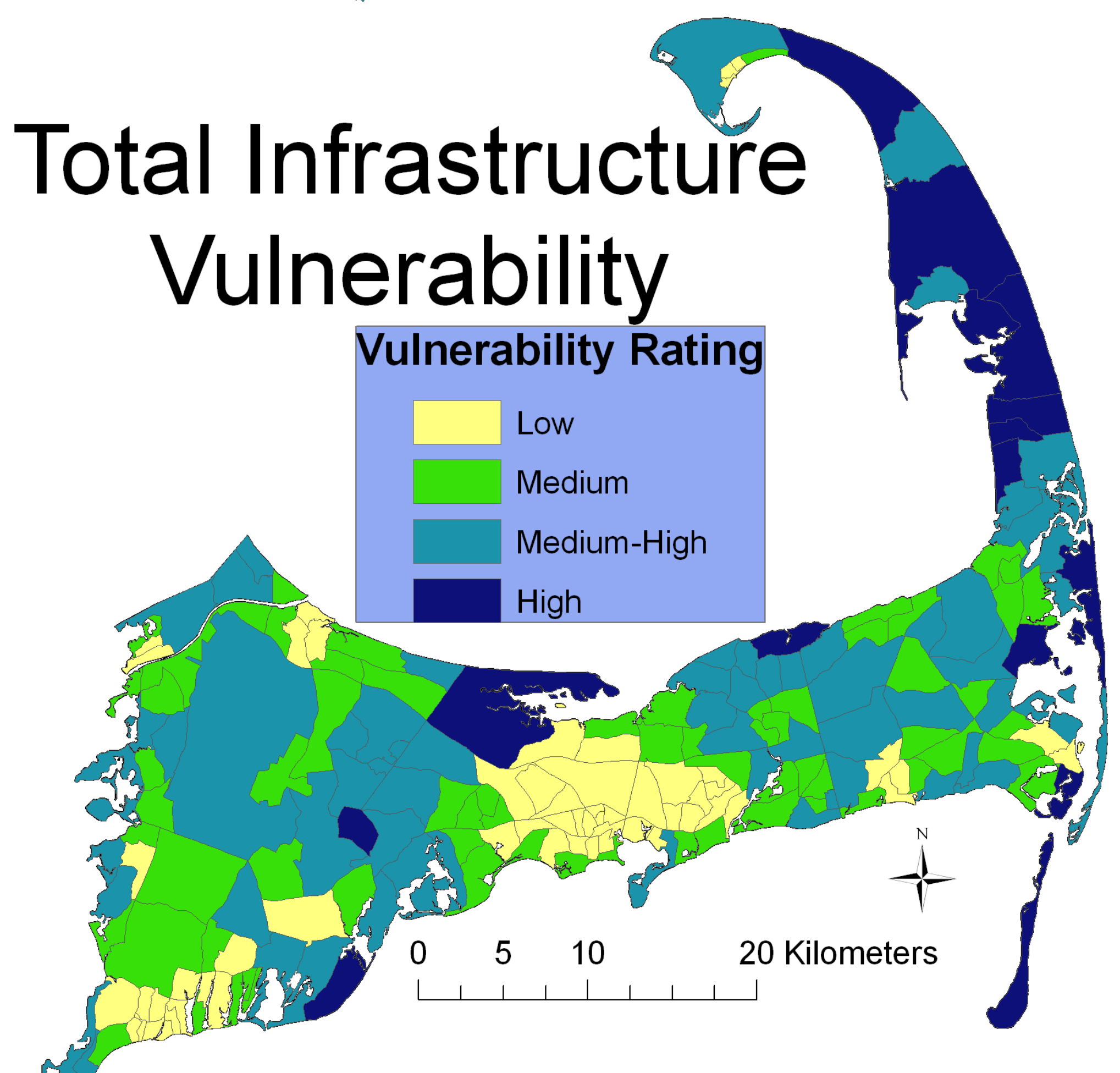
## Methodology

- 1) Collected relevant data.
- 2) Divided information into quarters, where the bottom quarter signified the lowest amount of risk and the top quarter denoted groups at the highest risk.
- 3) Assigned the first quarter the label 1 and so on until the information was distributed between four labels (1-4) where 1 represented the lowest risk and 4 represented the highest risk.
- 4) To assemble total vulnerability maps, I added all the relevant variables together and divided that information into quarters.
- 5) Repeated step 3 to signify level of risk in the total vulnerability maps.

## Infrastructure Vulnerability Inputs



## Total Infrastructure Vulnerability



## Factors Assessed

### Social Variables

Percent of population: greater than 65\*, younger than 18\*, low income\*, minority. Numbers of households: with 7 or more people, built before 1959, speaking no English. Numbers of people: 25 or older whose education ceased with high school, who commute to work by car/van/ truck.

### Infrastructure Variables

Distance from: hospitals\*, police stations\*, fire stations, schools, airports\*.

\* denotes variables shown in this poster

## Limitations and Conclusions

Variables are evenly weighed in this assessment, while in reality some variables contribute more heavily to vulnerability than others. A glimpse at the two *total vulnerability* maps indicates they are nearly mirror-images of one another. City planners should consider this polarization when preparing for an extreme storm by keeping routes to emergency services clear and providing increased services for socially vulnerable groups where they are most highly concentrated.

Cartographer: Yosefa Allegra Ehrlich, Fall 2008  
 Data Source: Mass GIS  
 Map Projection: 1983 Massachusetts State Plane  
 Tufts University Arts & Sciences, Environmental Studies Department

