Coastal Resiliency Training Workshop Three

welcome

Coastal Resiliency Training Workshops

Workshop One. Introduction to Coastal Dynamics and Resiliency
(Oct. 25th)

Dr. Jeffrey Andresen, State Climatologist & Co-Director
Great Lakes Integrated Sciences & Assessments Program (GLISA)

Dr. Guy Meadows, Director
Great Lakes Research Center, Michigan Tech. University

Dr. Richard Norton, Professor
University of Michigan School of Urban and Regional Planning

Workshop Two. Understanding and Gathering Coastal Data
(Nov. 1st)

Dr. Alan Arbogast, Professor and Chair
Department of Geography, Michigan State University

Dr. Richard Norton & Zach Rable
University of Michigan School of Urban and Regional Planning

www.resilientmichigan.org/workshops

Coastal Resiliency Training Workshops

Workshop Three. Using Coastal Data to Impact Local Planning

John Yellich, Director
Michigan Geological Survey, Western Michigan University

Dr. Richard Norton & Zach Rable
University of Michigan School of Urban and Regional Planning

Harry Burkholder, Executive Director
Land Information Access Association (LIAA)

Break

Vulnerability Assessment (Purpose)

1. Collection of data and information (when mapped) that illustrates human and community vulnerabilities to climate.
2. Key concerns are in respect to public health and property and costs associated with both.
3. Serves as a tool to assist community officials in choosing policy options that foster resilience in the face of both unforeseen and long-term challenges.

Vulnerable to What?

1. Extreme Temperatures
2. Severe Storms
3. Wildfire
4. Flooding
5. Shoreline Inundation and Erosion
6. Wind

Vulnerability Formula

Vulnerability = Sensitivity + Potential Exposure

Sensitivity refers to the degree to which a community or segments of the community could be impacted by an event – often includes looking at human population characteristics, such as:

- **Age**: older people and the very young.
- **General Health**: mobility, pre-existing diseases, obesity.
- **Socioeconomic**: no high school diploma, living in poverty, minority.

Vulnerability Formula

Vulnerability = Sensitivity + Potential Exposure

Exposure refers to hazards of the built or natural environment, such as:

- Impervious Surfaces
- Tree Canopy
- Soils
- Flood Prone Areas
- Steep Slopes
- Forest Area

Community Vulnerabilities Extreme Heat

Why Do we Care?

Extreme Heat is one of the leading causes of death for vulnerable people.

In 2016, 4,784 people visited Michigan emergency rooms for heat-related issues

Heat Vulnerability Assessment can help:

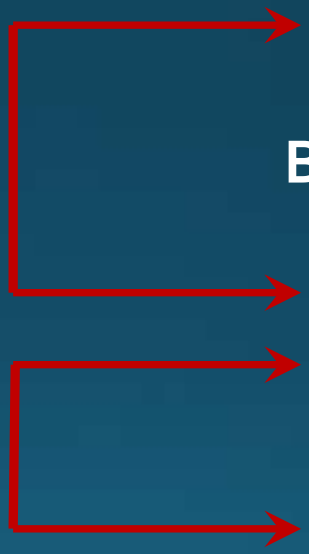
- Identify locations for cooling centers
- Focus public investments on tree canopy and pervious landscaping
- Identify areas for emergency responders to focus on

Vulnerability Formula

Vulnerability = Potential Exposure + Sensitivity

Sensitive Populations

- % Population 65 or older
- % Households with people living alone
- % Non-white population
- % Living in poverty
- % with less than H.S. education

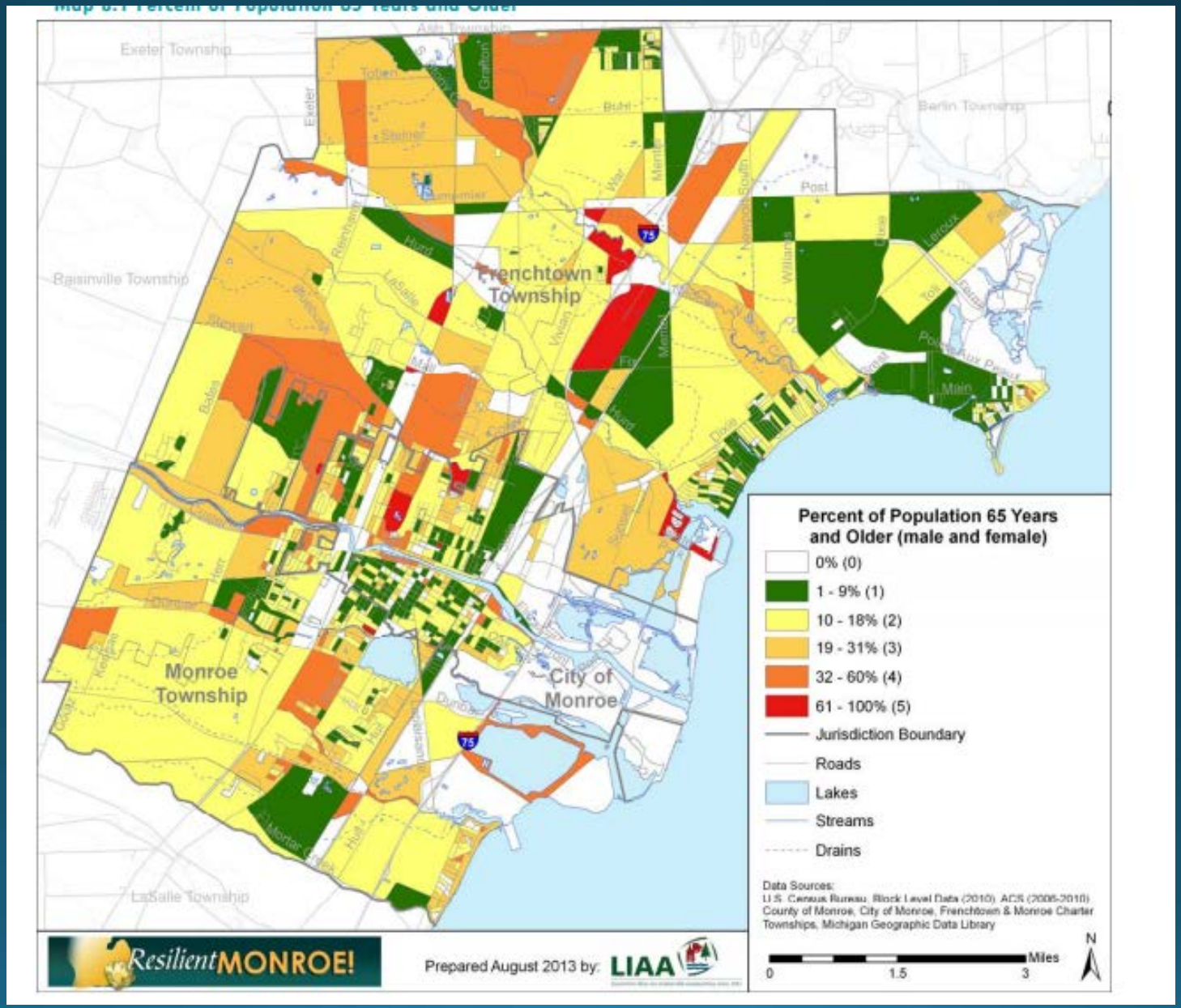


By Census Block

By Census Block Group

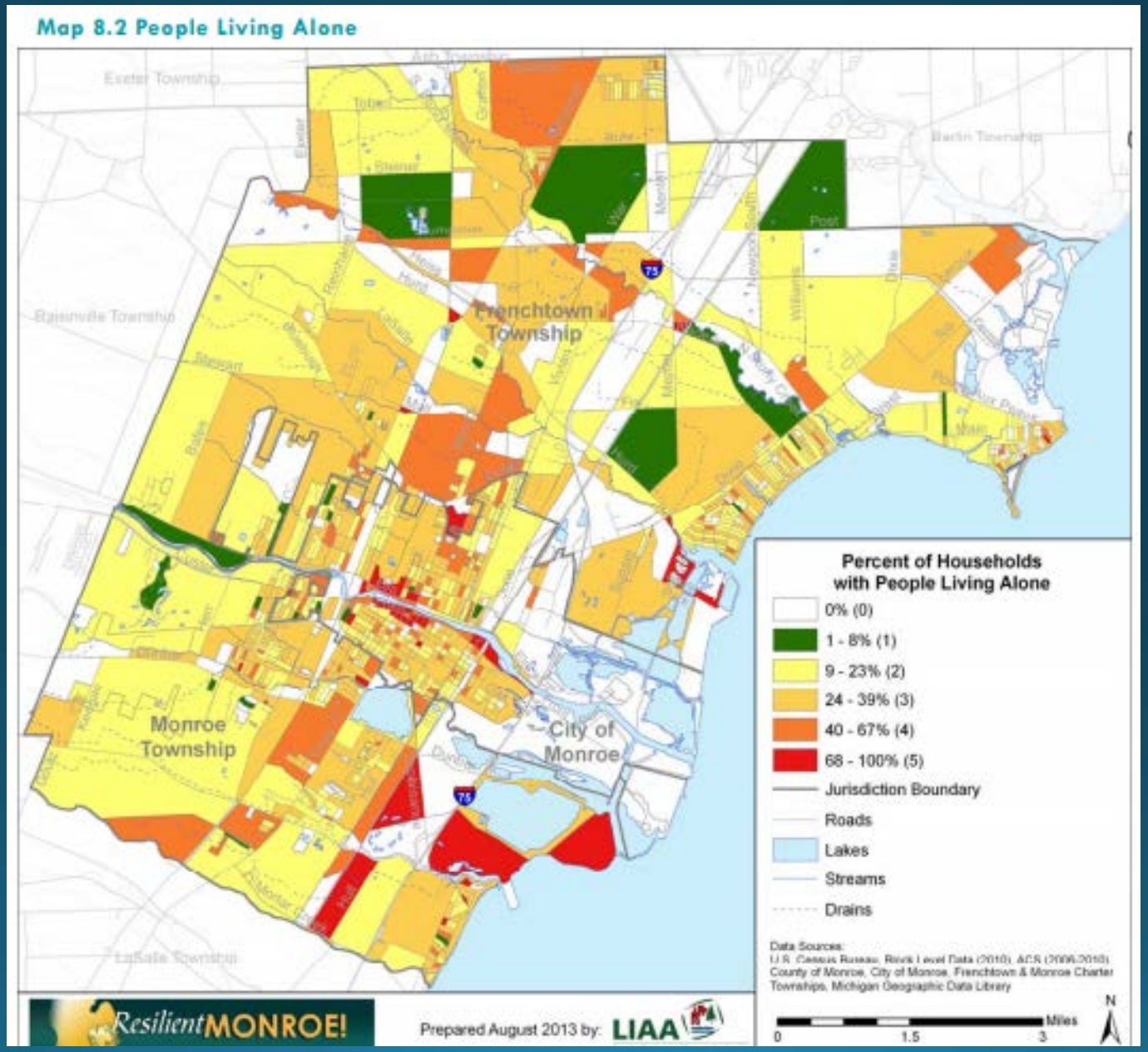
Community Context: Sensitive Populations

Percent of Population
65 Years and Older
By Census Block



Community Context: Sensitive Populations

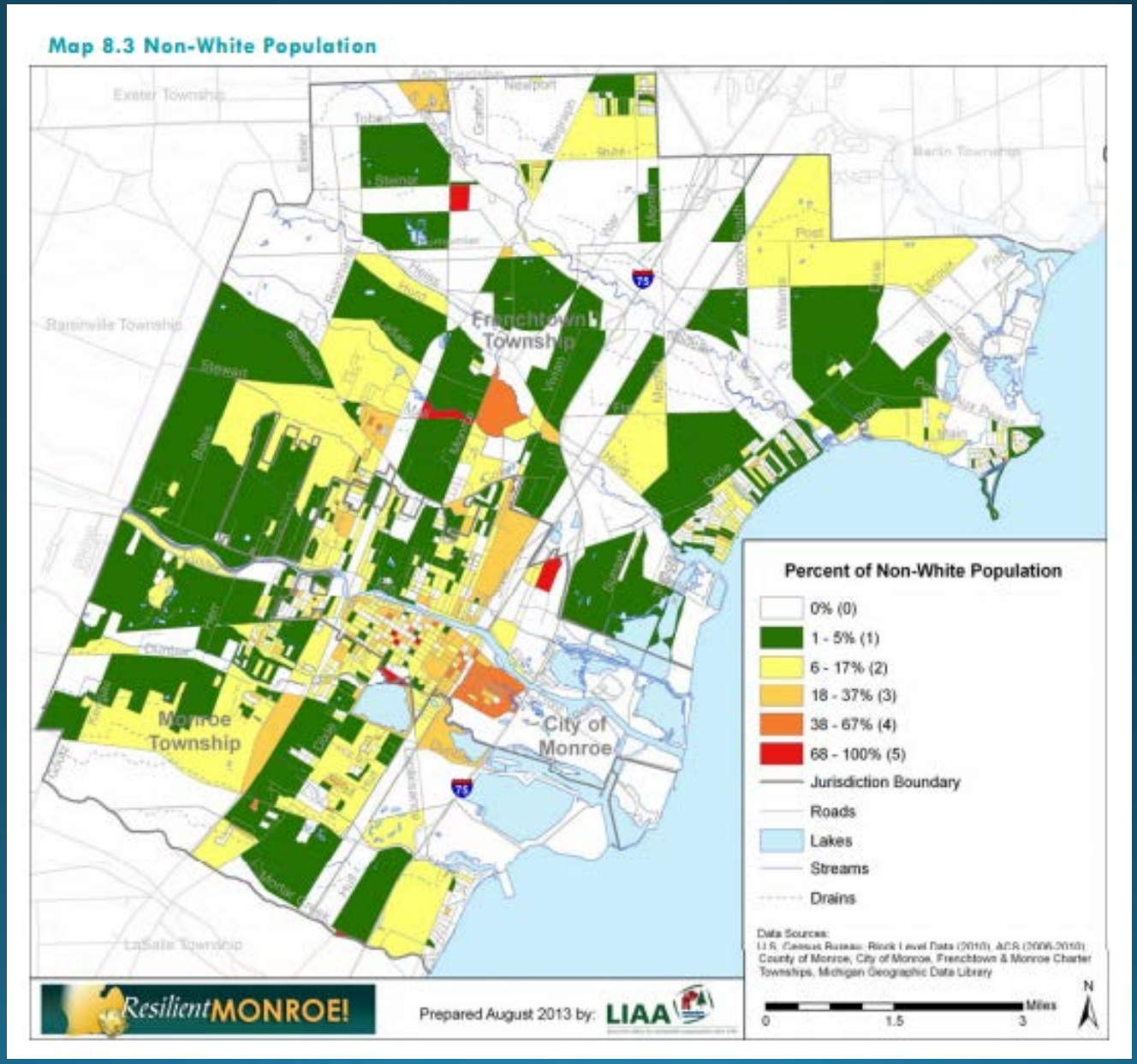
Percent of Households with People Living Alone
By Census Block



Community Context: Sensitive Populations

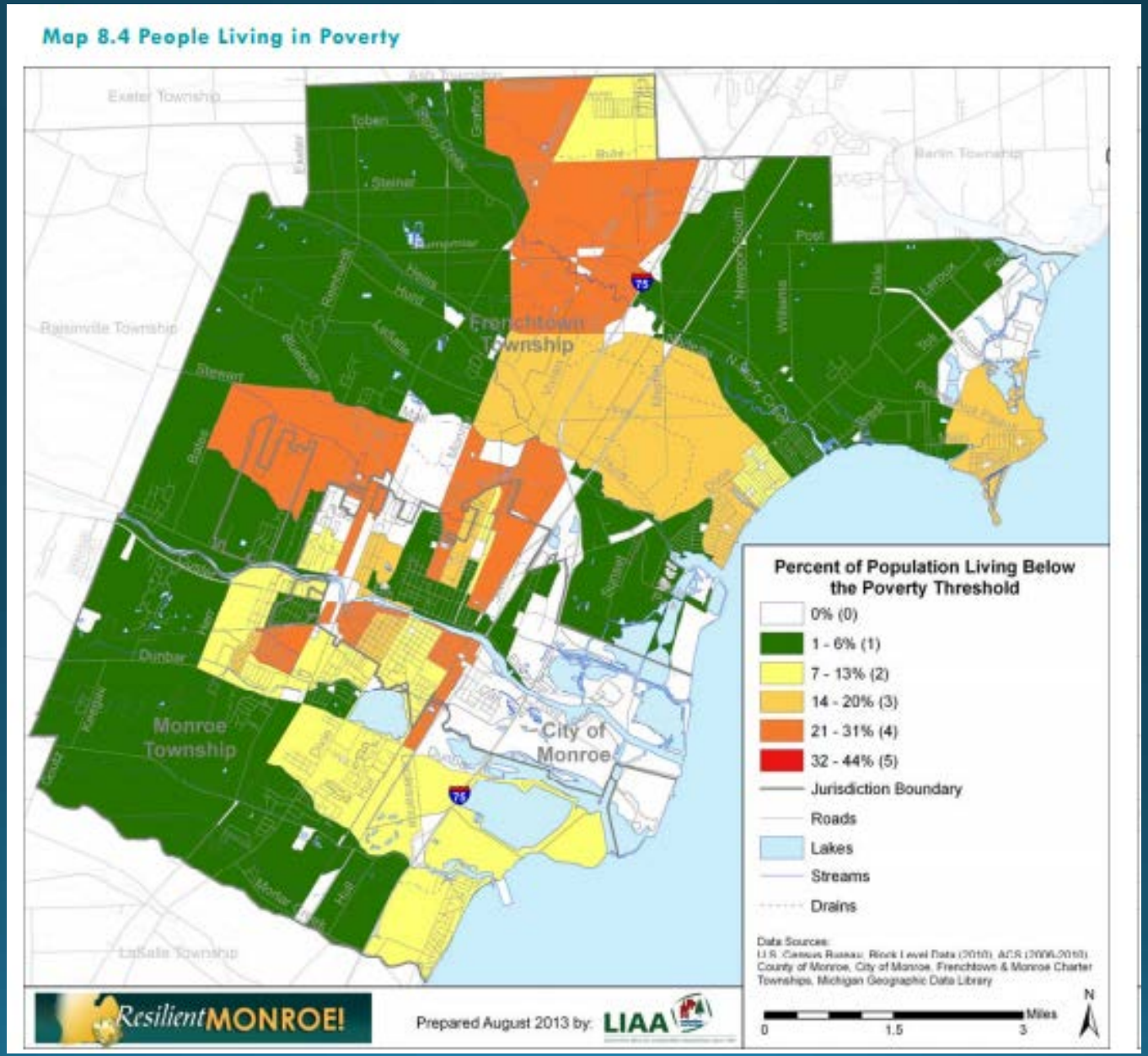
Percent of Non-White Population

By Census Block



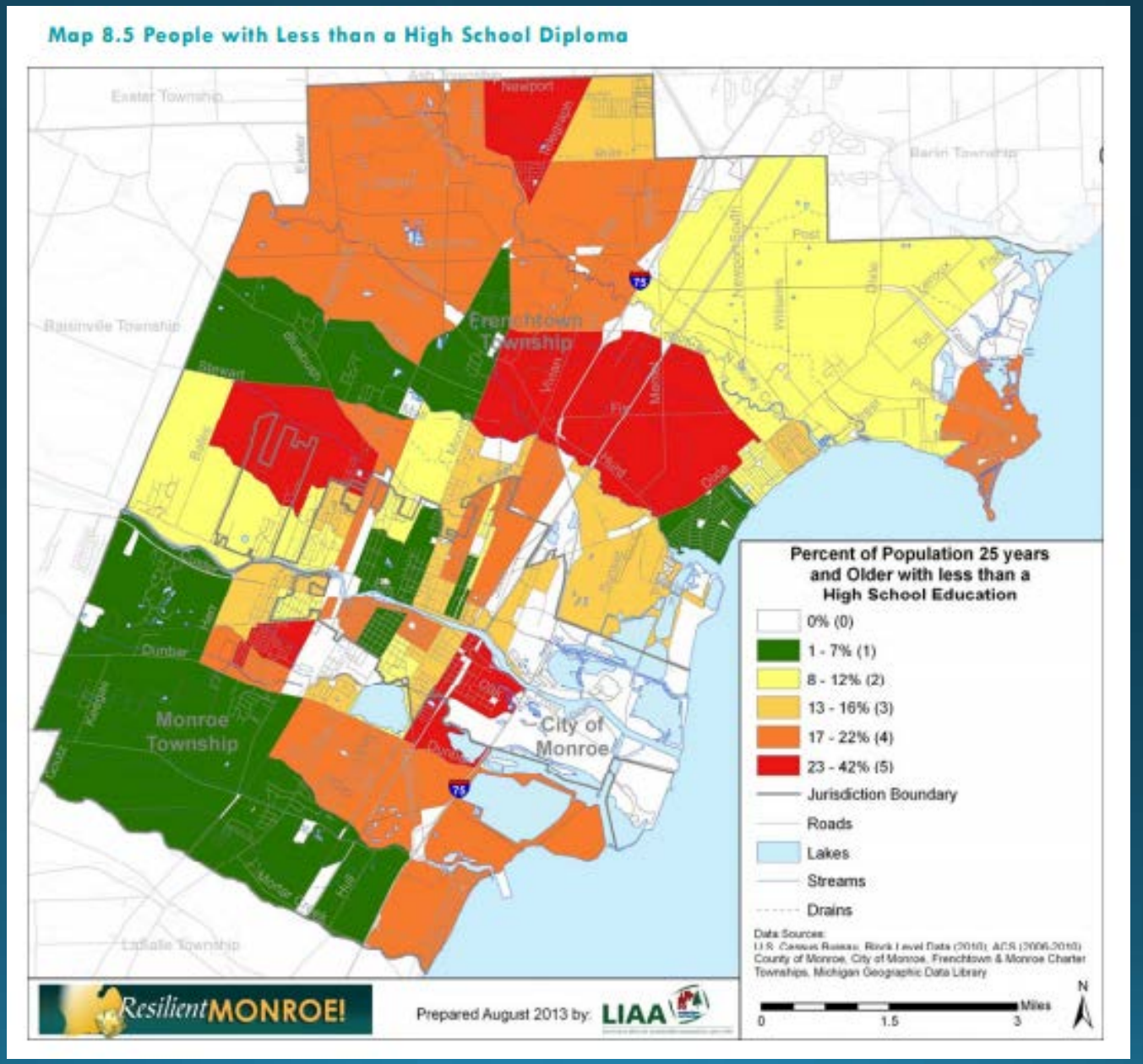
Community Context: Sensitive Populations

Percent of Households Living Below the Poverty Threshold
By Census Block Group



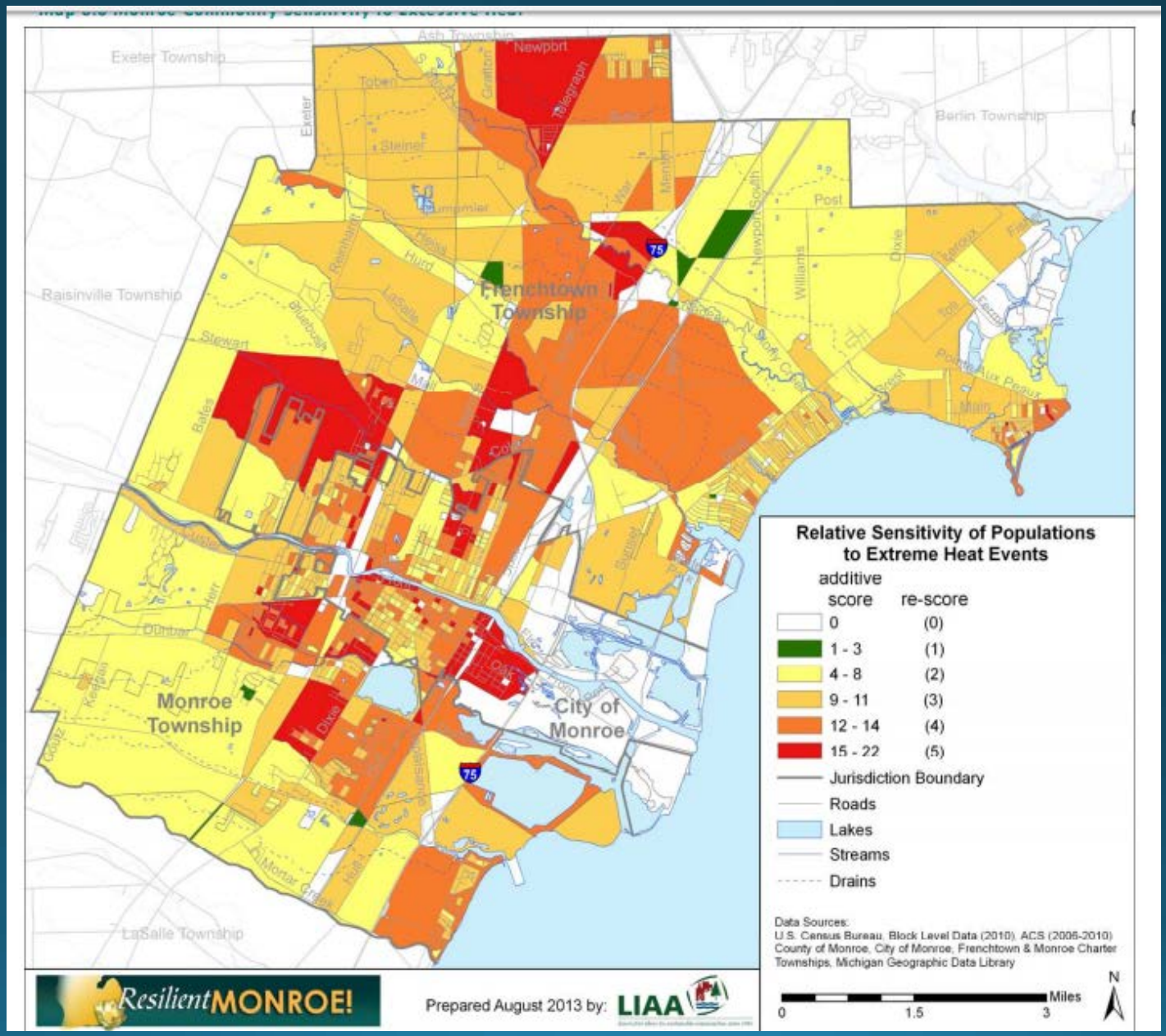
Community Context: Sensitive Populations

Percent of 25 Years and Older with less than a High School Education
By Census Block Group



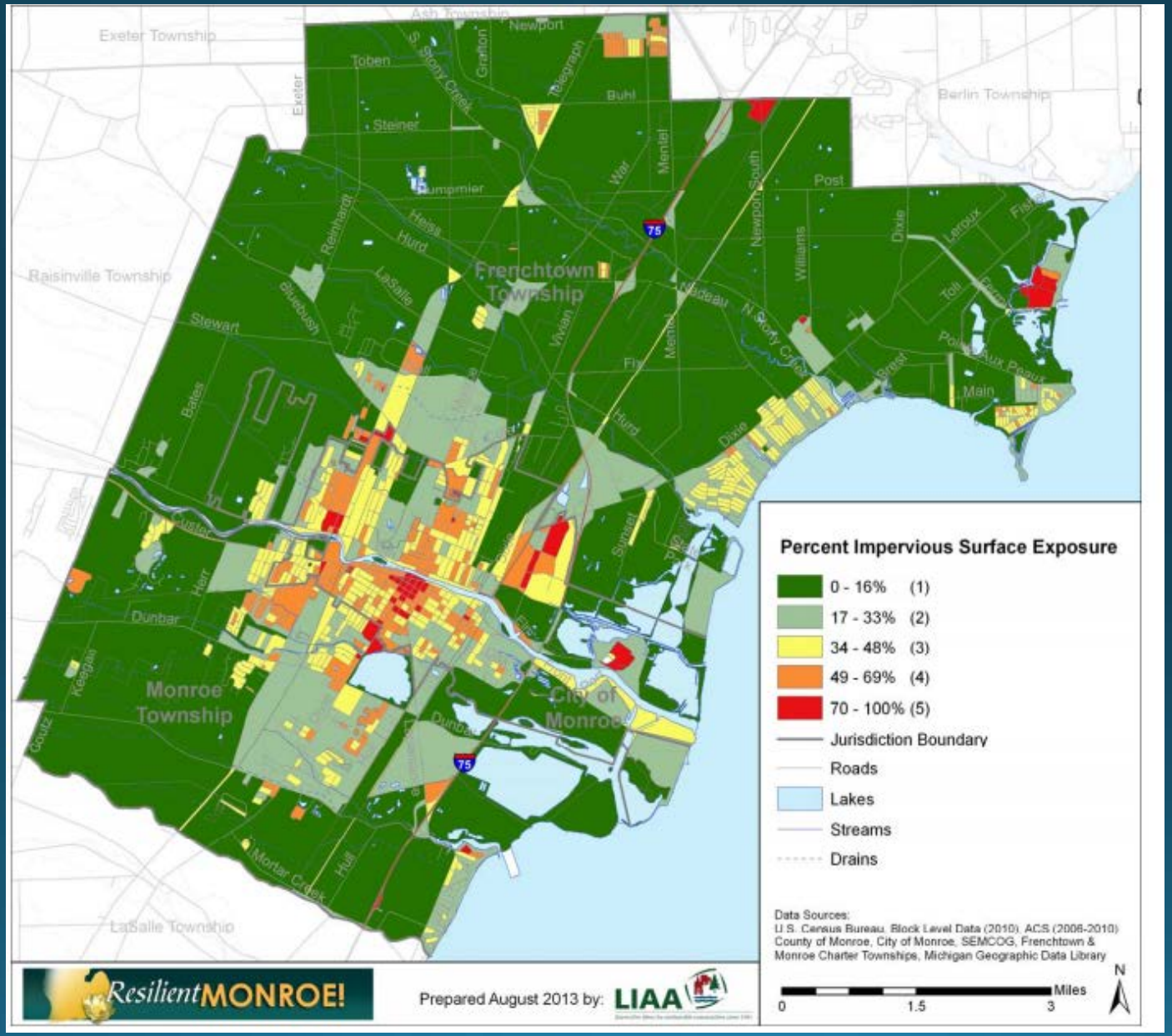
Composite: Total Sensitivity to Extreme Heat Events

By Census Block



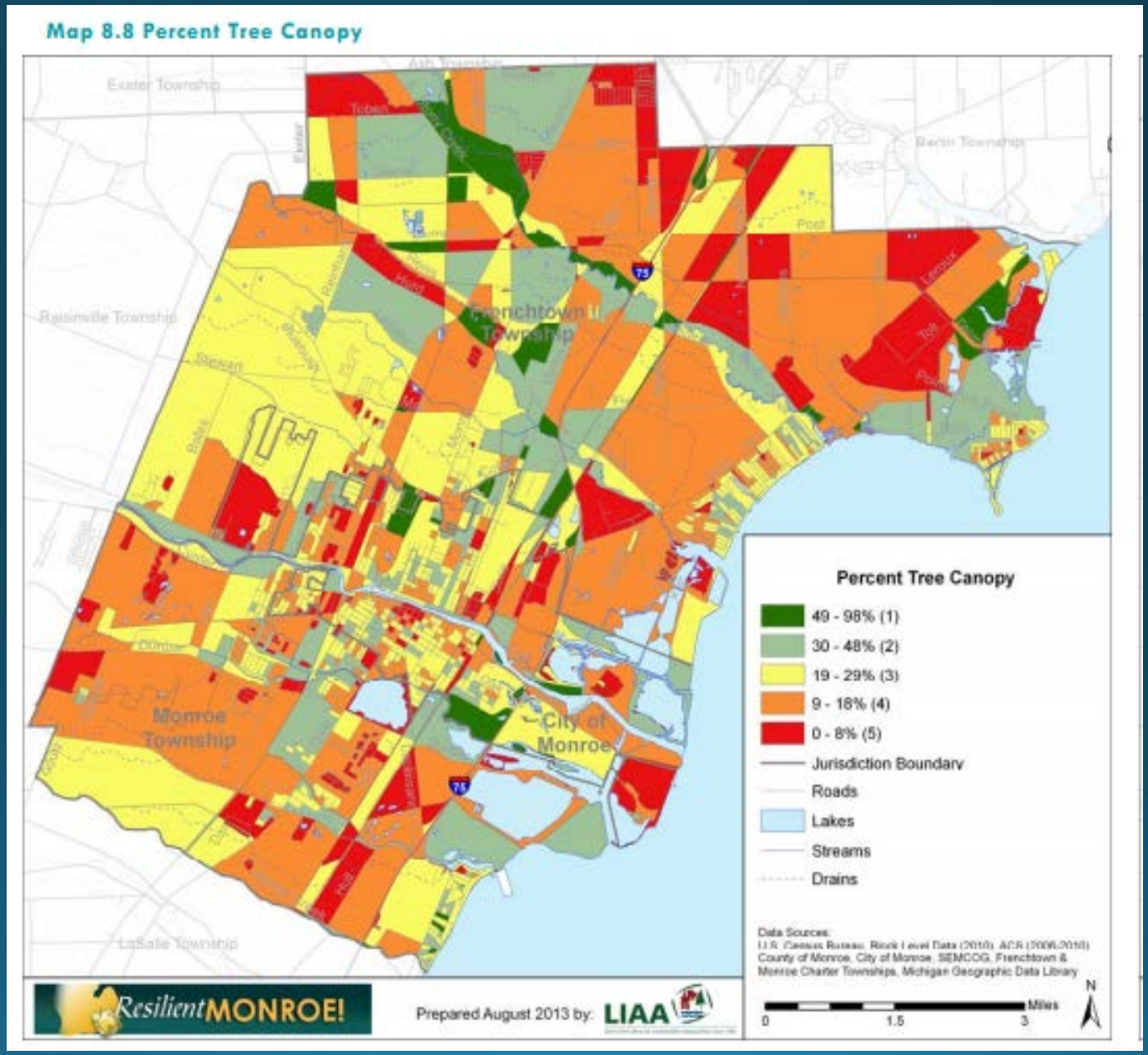
Community Context: Exposures

Percent of Impervious Surface

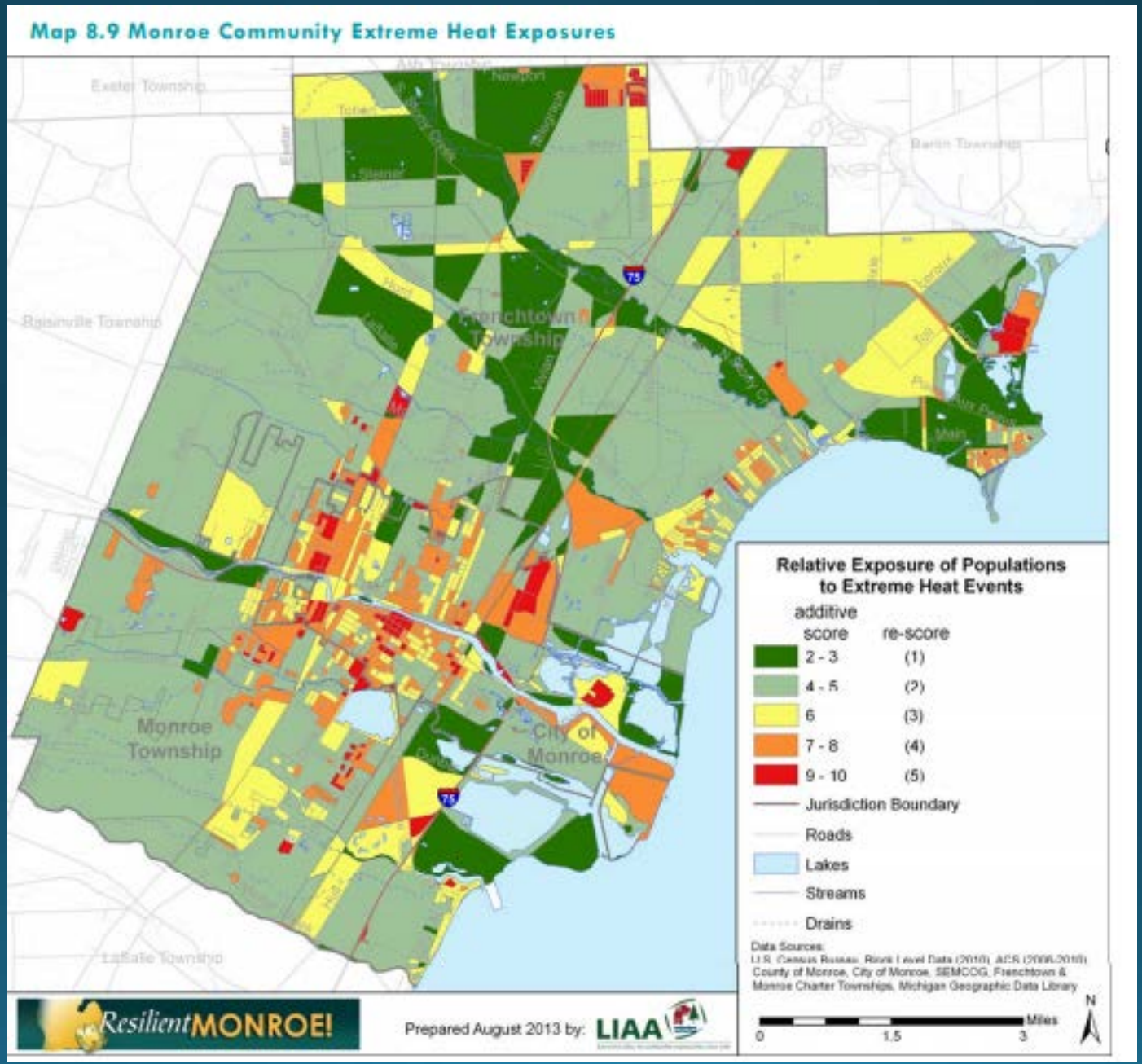


Community Context: Exposure

Percent Tree Canopy

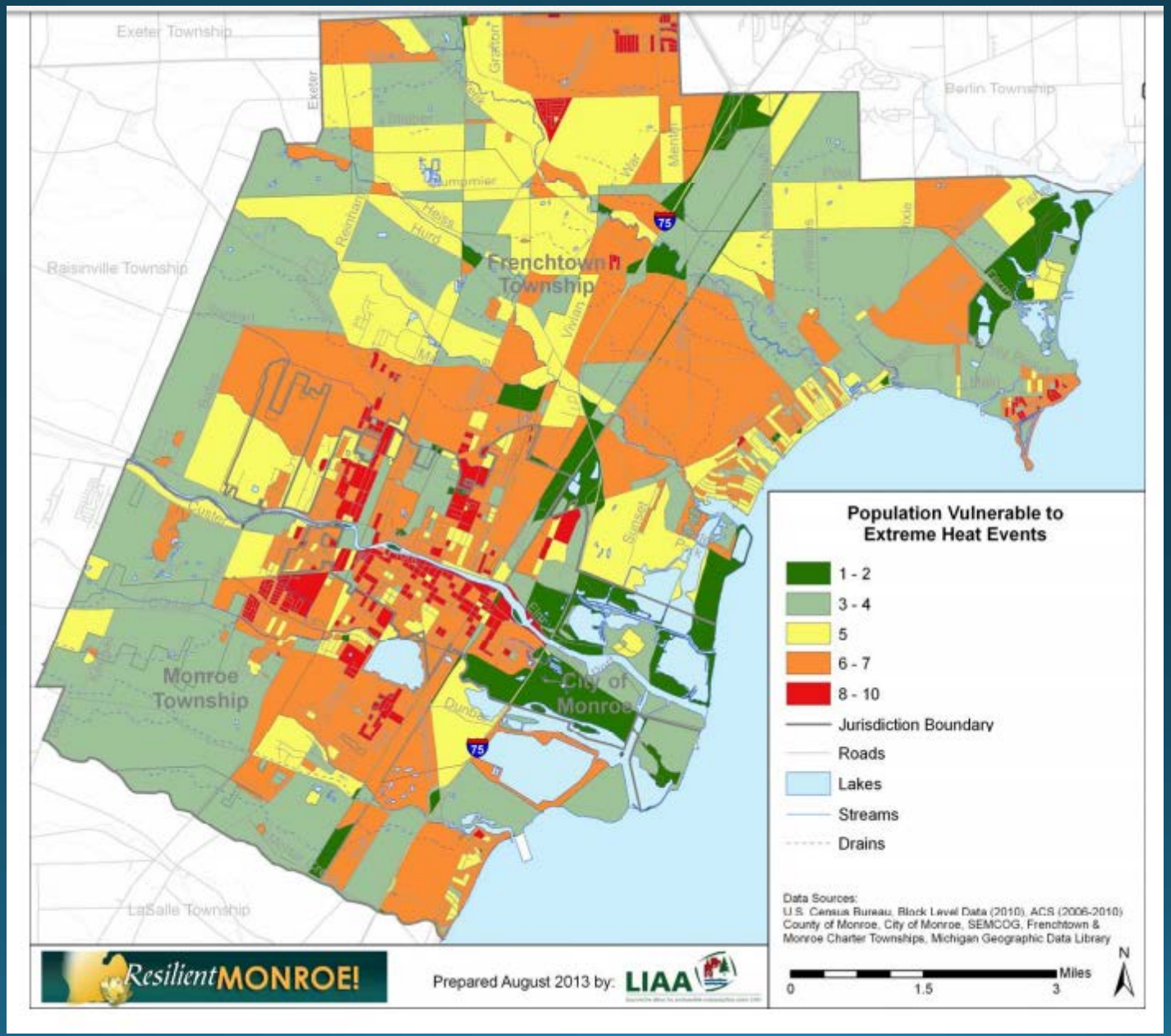


Composite: Relative Exposure of Population to Extreme Heat Events



Vulnerability = Potential Exposure + Sensitivity

Result: Population Vulnerable to Heat Events



Community Vulnerabilities: Flooding

Why Do we Care?

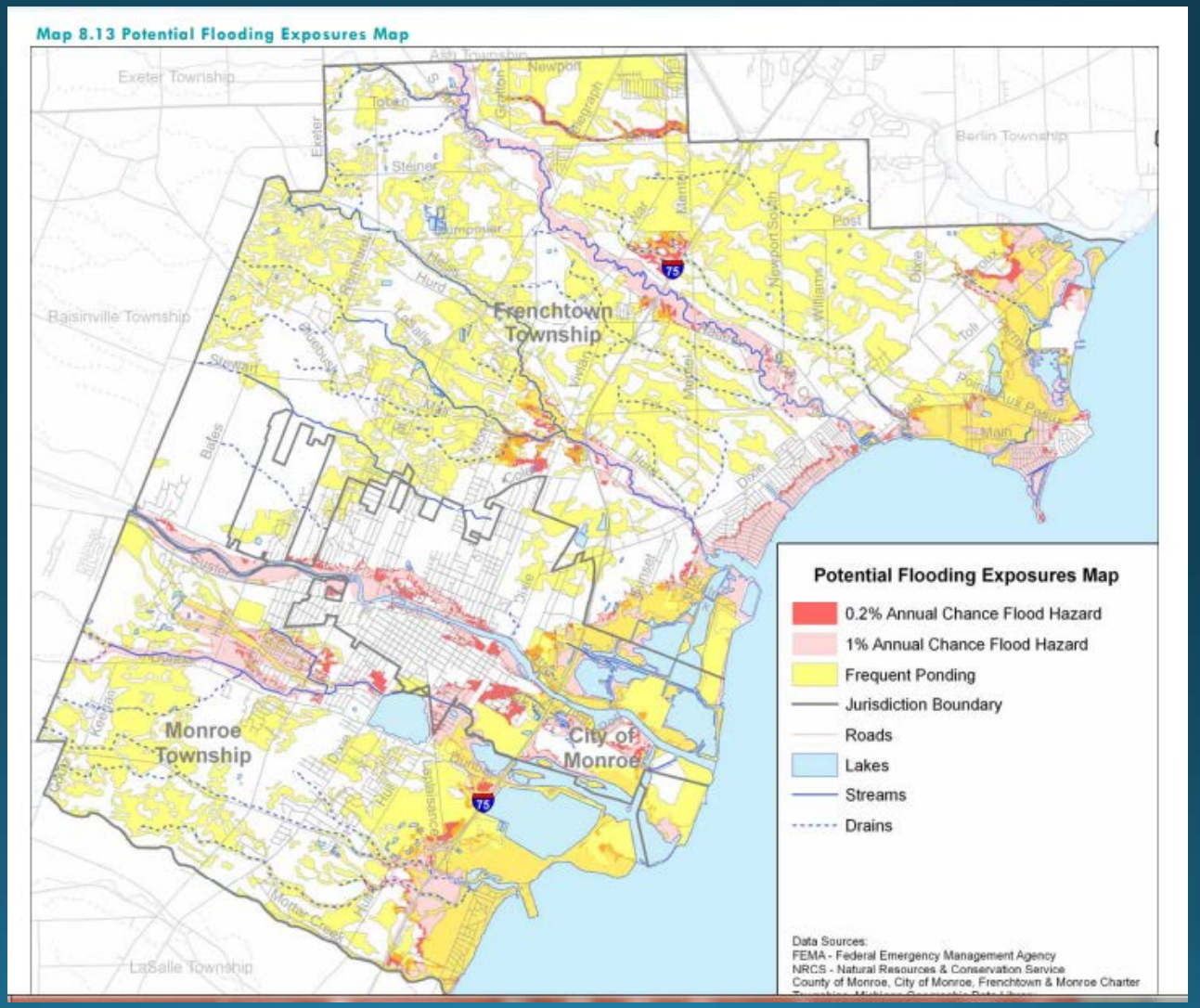
Financial implications - damage to homes and public infrastructure.

Flooding Vulnerability Assessment can help:

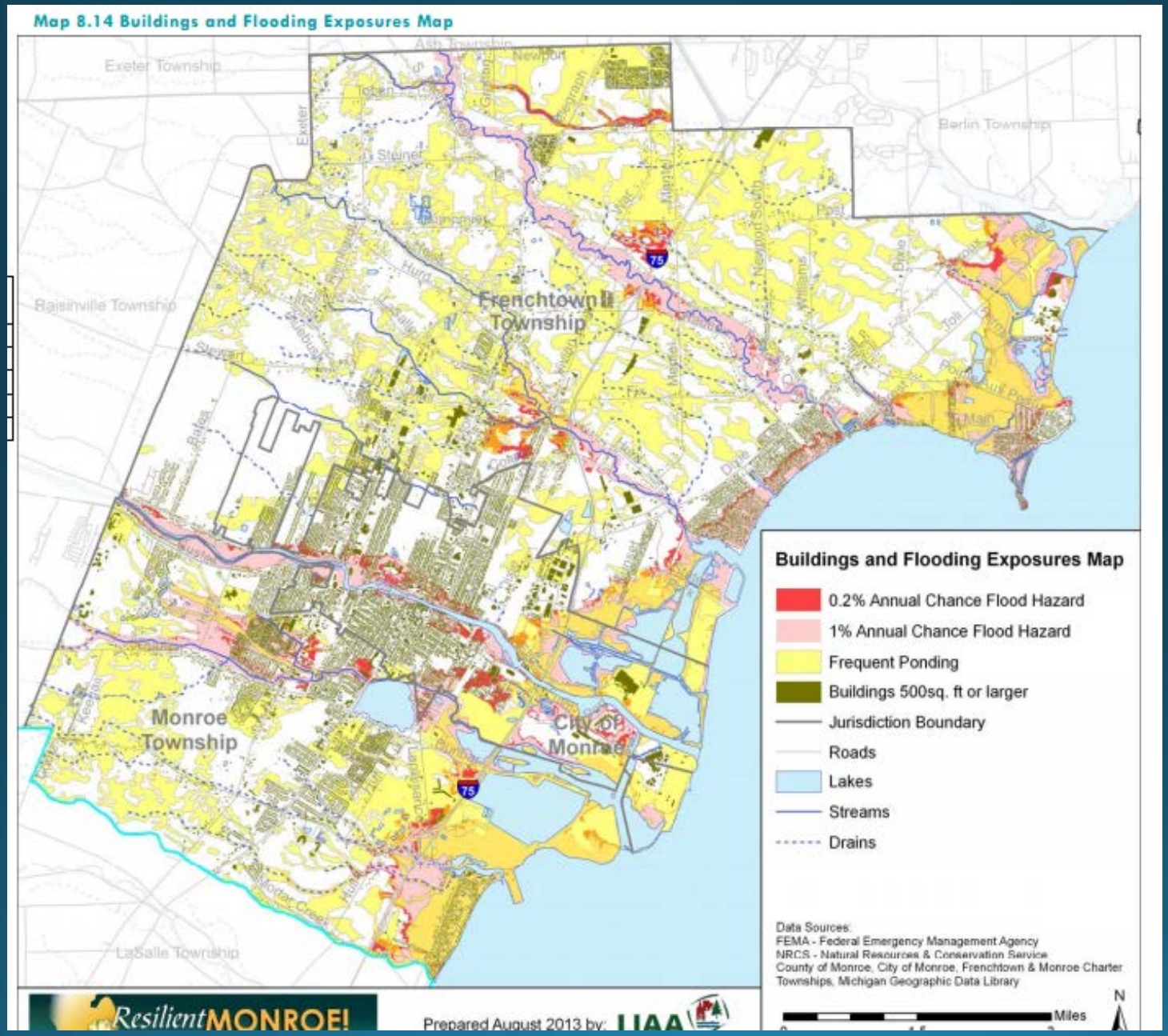
- Identify locations for stormwater infrastructure investments
- Identify priority areas for wetland restoration
- Inform transportation infrastructure investments
- Inform zoning and building codes
- Identifying areas where building should be limited

Community Context: Exposure(s)

- Digital Elevation
- 100 Year Flood (FEMA)
- 500 Year Flood (FEMA)
- Frequent Ponding (soils)

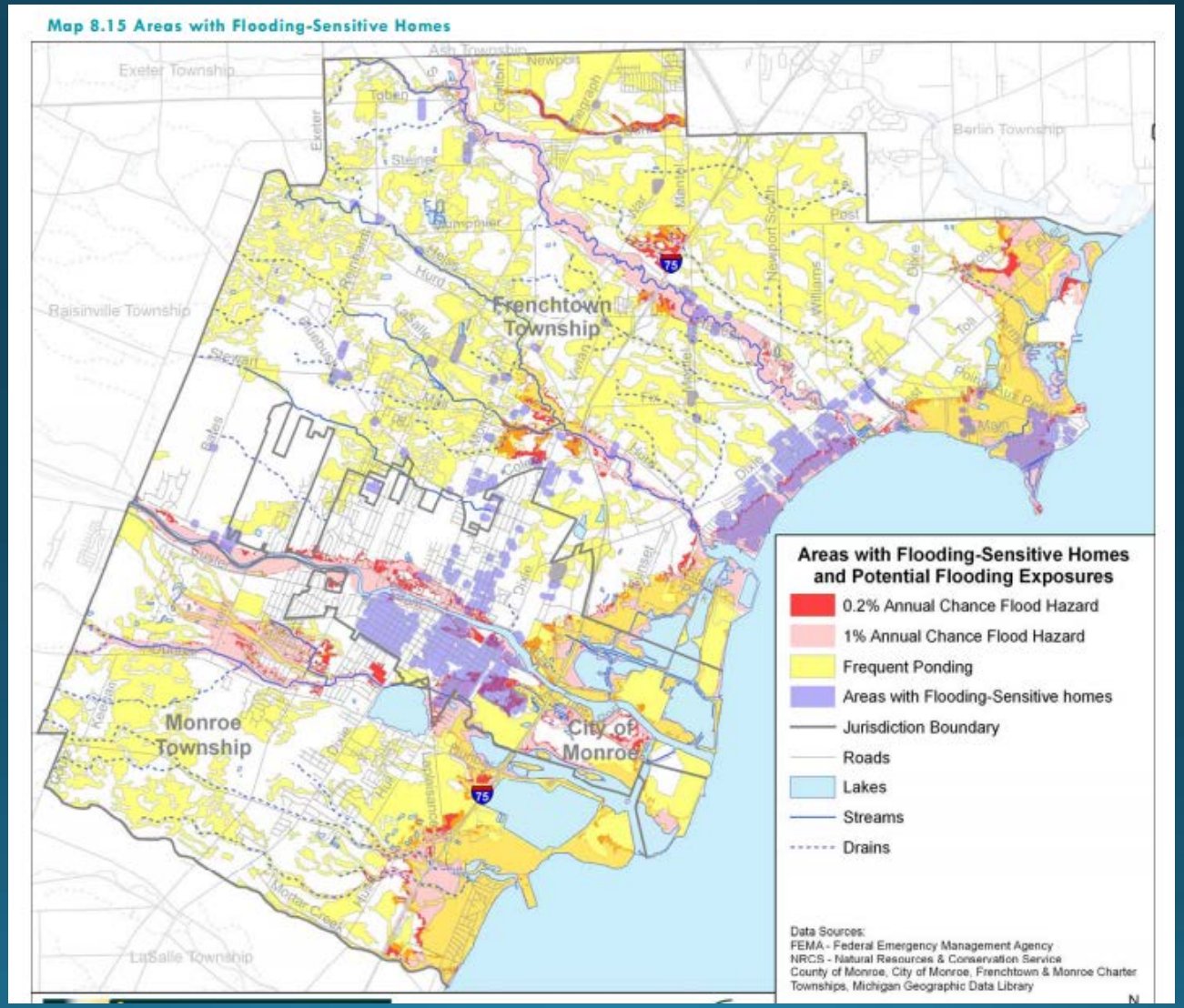


Community Context: Overlay Building Footprints



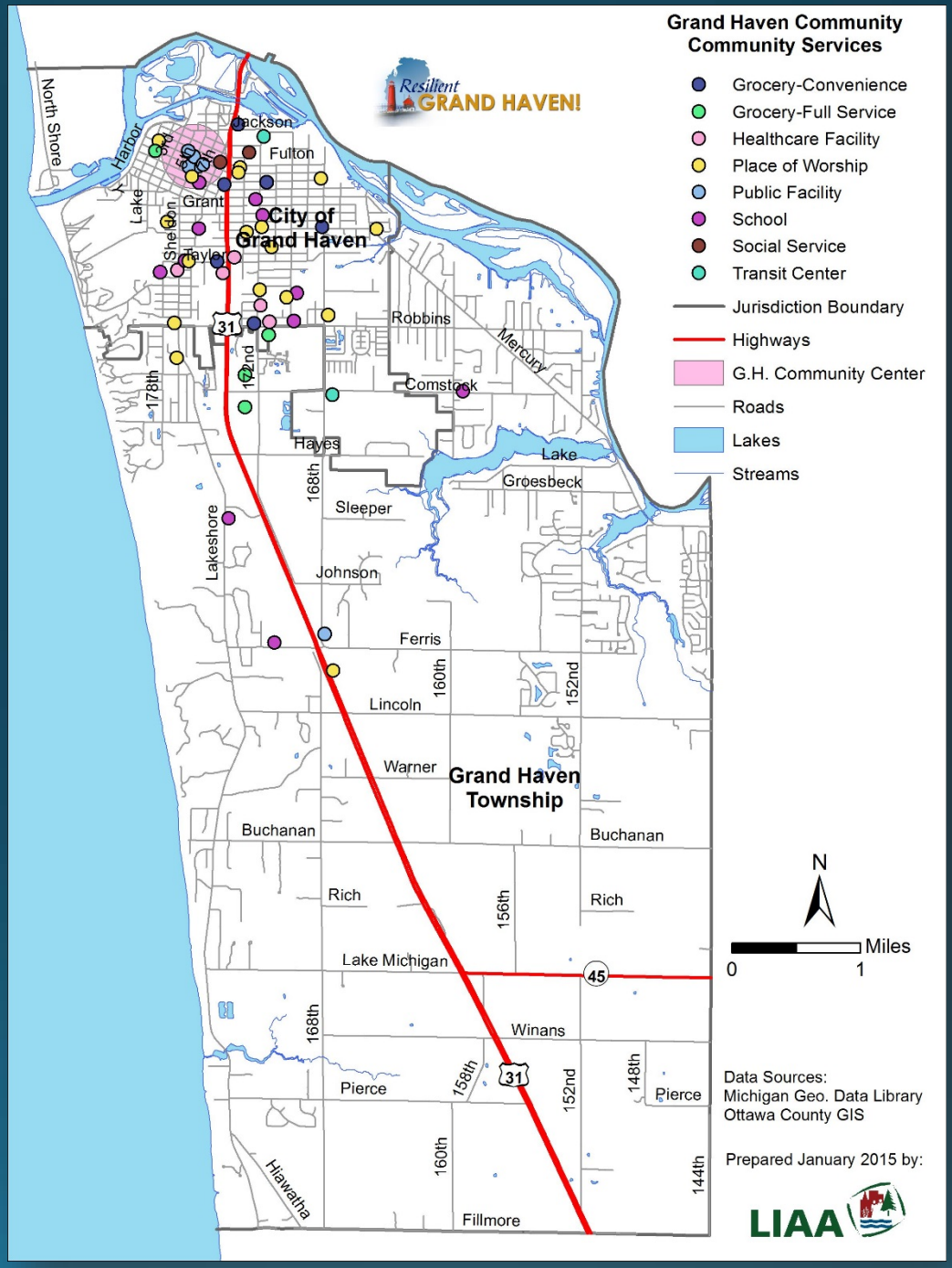
Community Context: Sensitivities = Areas with Flooding Sensitive Homes

- Homes Built Before 1940
- Low-Income Homes
- Low-Value Homes (SEV)

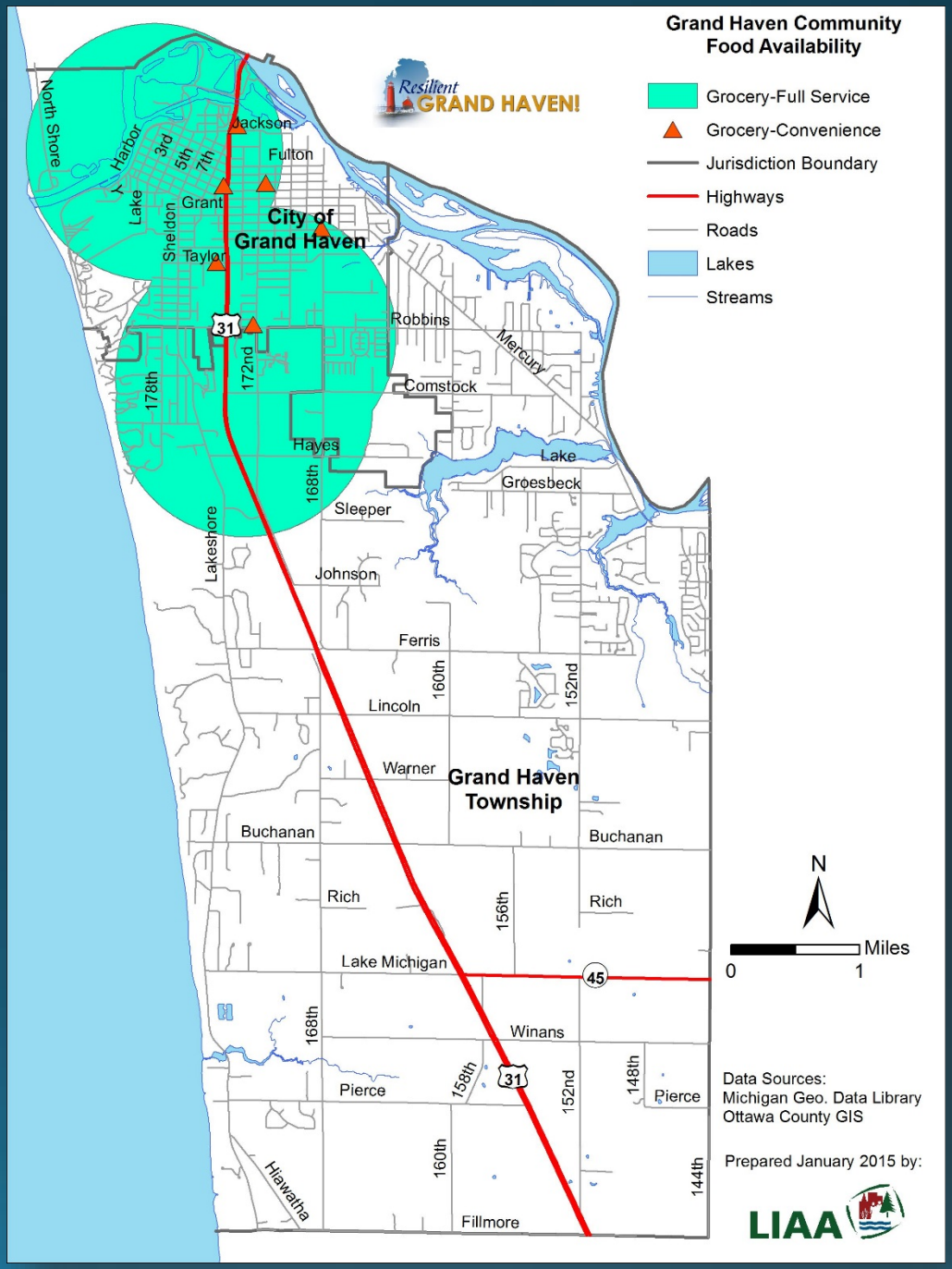


Additional Layers of Data To Help Shape Decisions

Location of Community Services



Access to Food



Questions