Social Vulnerability to Climate Change in Greater Boston

Seleeke Flingai, PhD, MPA
Research Analyst II
Climate Vulnerability
A definition

“[Climate vulnerability is] the propensity or predisposition to be adversely affected by the impacts of climate change. Vulnerability encompasses a variety of concepts including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.”

Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment Report (2014)
January 2018
Nor’easter
March 2018
East Boston flooding
July 2019
Hottest month on record for the planet

Photo credit: Jean-Sebastien Evrard/AFP/Getty Images
An elderly man sits outside in hot weather

Photo credit: AP Photo/M. Spencer Green
Climate change impacts some populations more severely than others.

Efforts to mitigate climate change and build resiliency through the built environment should prioritize communities most vulnerable to climate impacts.

For solutions to tackle vulnerabilities at the root, those most impacted should be active leaders and participants in mitigation and resiliency efforts.
How do we think about vulnerability?

Vulnerability is often characterized as encompassing three dimensions:

**Exposure**
How close is an individual or group to a hazard

**Sensitivity**
The pre-existing social, economic, and political conditions of a given community influence access to resources and exposure to hazards

**Adaptive Capacity**
A group’s ability to plan for and adapt to changing conditions
Climate Exposures

Extreme Heat

Flood

Future Coastal Flood
Climate Sensitivity

Age

Exposed Occupations

Housing Features & Demographics

Health
March 2010
Mystic River Flooding

Photo credit: David Mussina
Workers Exposed to Extreme Heat
Chronic disease: increased risk of medication and diet interruptions, hospital visits and deaths
Climate Adaptive Capacity

Info Access, Social Networks & Mobility

Financial Resources & Access

Race, Ethnicity, and Language

Additional Housing Demographics
Internet access and digital equity: accessing information to plan for climate change
Housing: can we build apartment complexes and affordable housing that are resilient enough to mitigate climate impacts for residents?
Social networks and community building
METHODS AND RESULTS

Extreme Heat Vulnerability
13% of the region’s residents live in heat-vulnerable tracts.
Highly concentrated in the urbanized inner core

Highest heat vulnerability in 7 of 101 MAPC municipalities: Chelsea, Everett, Lynn, Revere, Boston, Malden, Framingham
METHODS AND RESULTS

Flood Vulnerability
Flood Vulnerability

High adaptive capacity of many suburban communities reduces vulnerability to flood zone risks
METHODS AND RESULTS

Future Coastal Flood Vulnerability
Highest relative social vulnerability to future coastal flooding (sea level rise + storm surge) in Boston Harbor region may be in Revere, Winthrop, Chelsea, East Boston and Quincy.
Climate vulnerability is more than exposure. All three dimensions are important.

Socially vulnerable populations can be found in every city and town.

Making the built environment more resilient is key. Investing in social infrastructure is just as critical.
Next steps

Inform our MetroCommon 2050 process

Use the analysis to inform MAPC’s climate work

Work with cities and towns for more local vulnerability analyses

Help us take action:
Explore the maps and download the data at climate-vulnerability.mapc.org
Thank you!

Seleeke Flingai, PhD, MPA
Research Analyst II
sflingai@mapc.org
617-933-0758

Caitlin Spence, PhD
GIS and Planning Analyst II
cspence@mapc.org
617-933-0723

Jessie Partridge Guerrero
Research Manager
jpartridge@mapc.org
617-933-0726

