

Climate Change Mitigation and Adaptation

This phase of MetroCommon is for looking at the region's major challenges and opportunities



Breached Seawall - Gardner Road (Woods Hole, MA)
Photo Credit: Jim Kuhn

It's a whole new climate, Greater Boston. Now what?

- ▶ Climate change is having a **widespread effect** on our region
- ▶ **We have time**, however, to make the worst-case scenarios less likely. We have the facts and knowledge to do it.
- ▶ We can prosper even with large climate changes. But only if we focus on the challenge now through **shared action and behavior change**.



Flooding at North Bridge Visitor's Center, Concord MA
Photo Courtesy: U.S. Army Corps of Engineers, New England District

Why we should care?



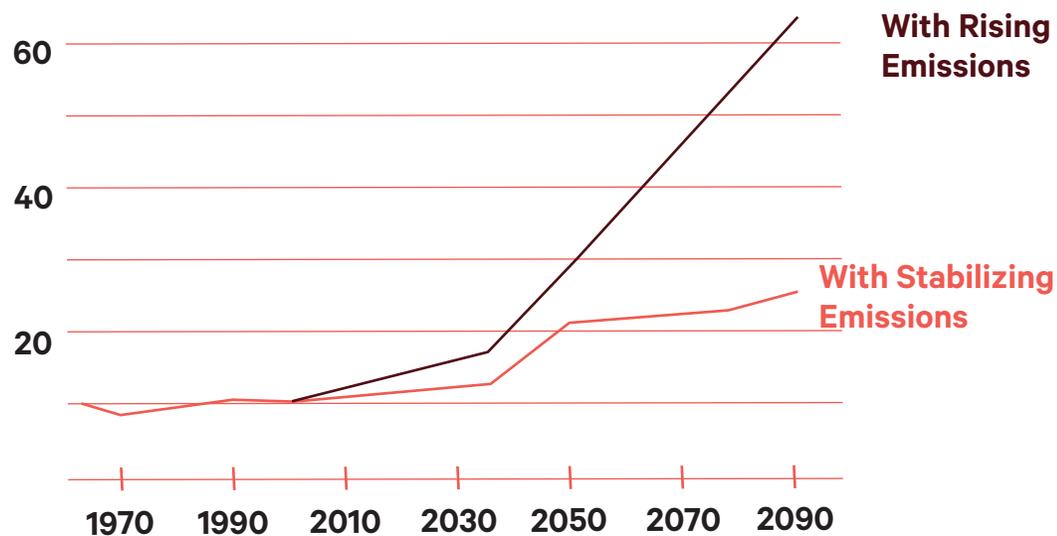
Climate-related changes will alter food production, land use, transportation, the economy, health, and much more.

Climate change will impact municipal finance in many ways: for example, 3 feet of sea level rise would threaten \$104 million of property taxes across 89 communities in Metro Boston (Shi & Varuzzo, 2020)



More Days Above 90°

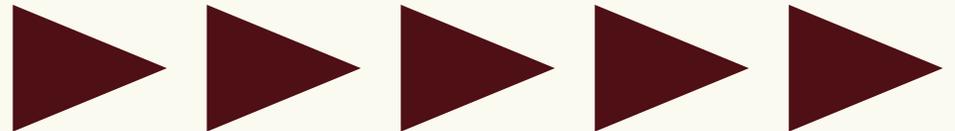
Data shown for the Charles River Watershed, Data courtesy Northeast Climate Science Center



As if that's not
enough...

Low-income communities and communities of color have contributed the least to this reality. A host of systemic disadvantages means they stand to bear the worst impacts.

Indicators of vulnerability to climate hazards, such as heat and flooding, can be grouped two categories, **sensitivity**, and **adaptive capacity**



Climate Vulnerability

Sensitivity

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

Age



Exposed Occupations



Health



Housing Features and Household Characteristics



Climate Vulnerability

Adaptive Capacity

A group's ability to plan for and adapt to changing conditions

Info Access, Social Networks, and Mobility



Financial Resources and Access



Race, Ethnicity, and Language



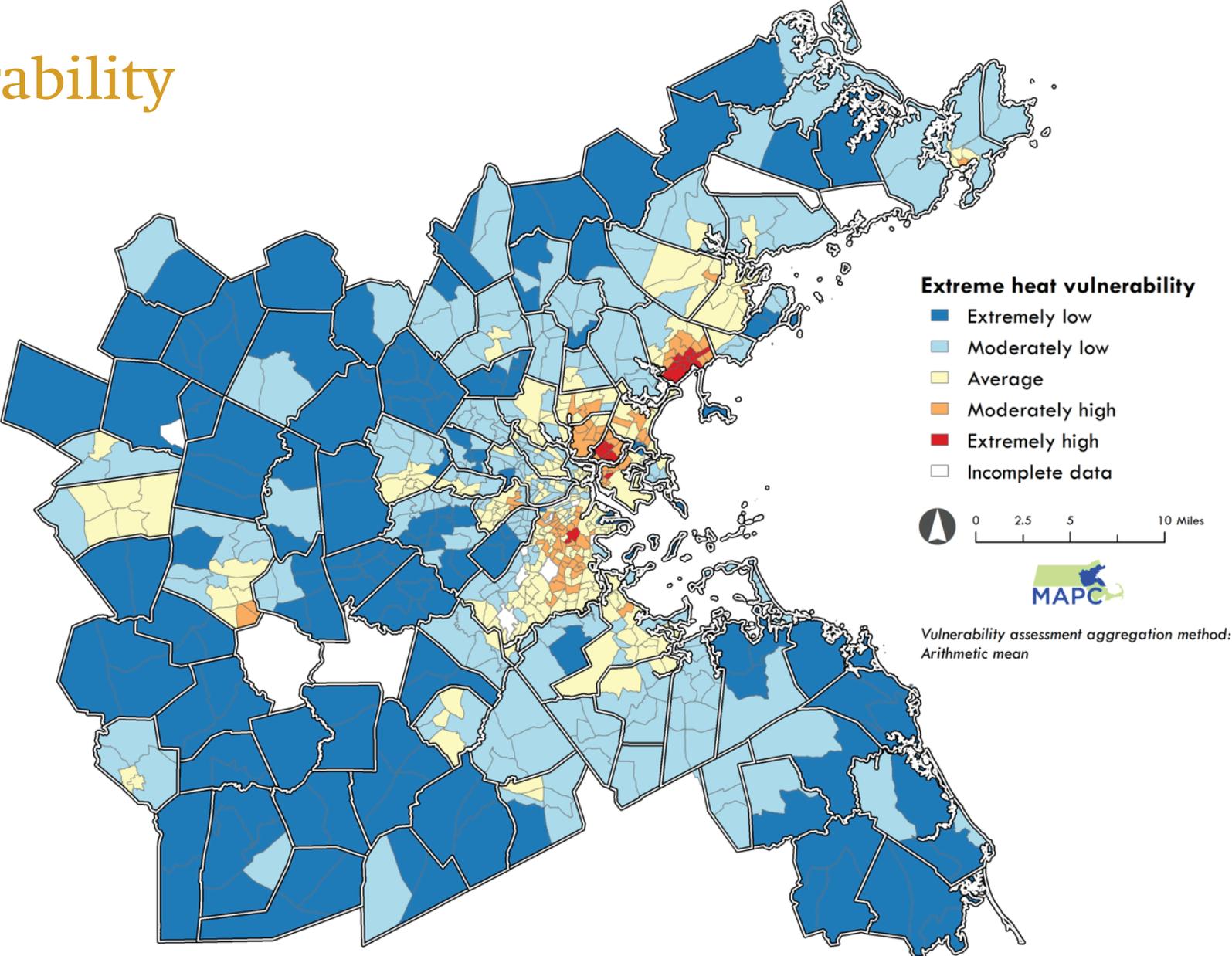
Additional Housing Characteristics



Extreme Heat Vulnerability

13% of the region's residents live in tracts highly vulnerable to extreme heat (409,000 people)

► **Highest heat vulnerability in 7 of 101 MAPC municipalities**
Chelsea, Everett, Lynn, Revere, Boston, Malden, Framingham



How did we get here?

Our use of fossil fuels has put too much carbon in the atmosphere. This has set off changes that are altering weather patterns – temperature, wind, rainfall, and storm events.



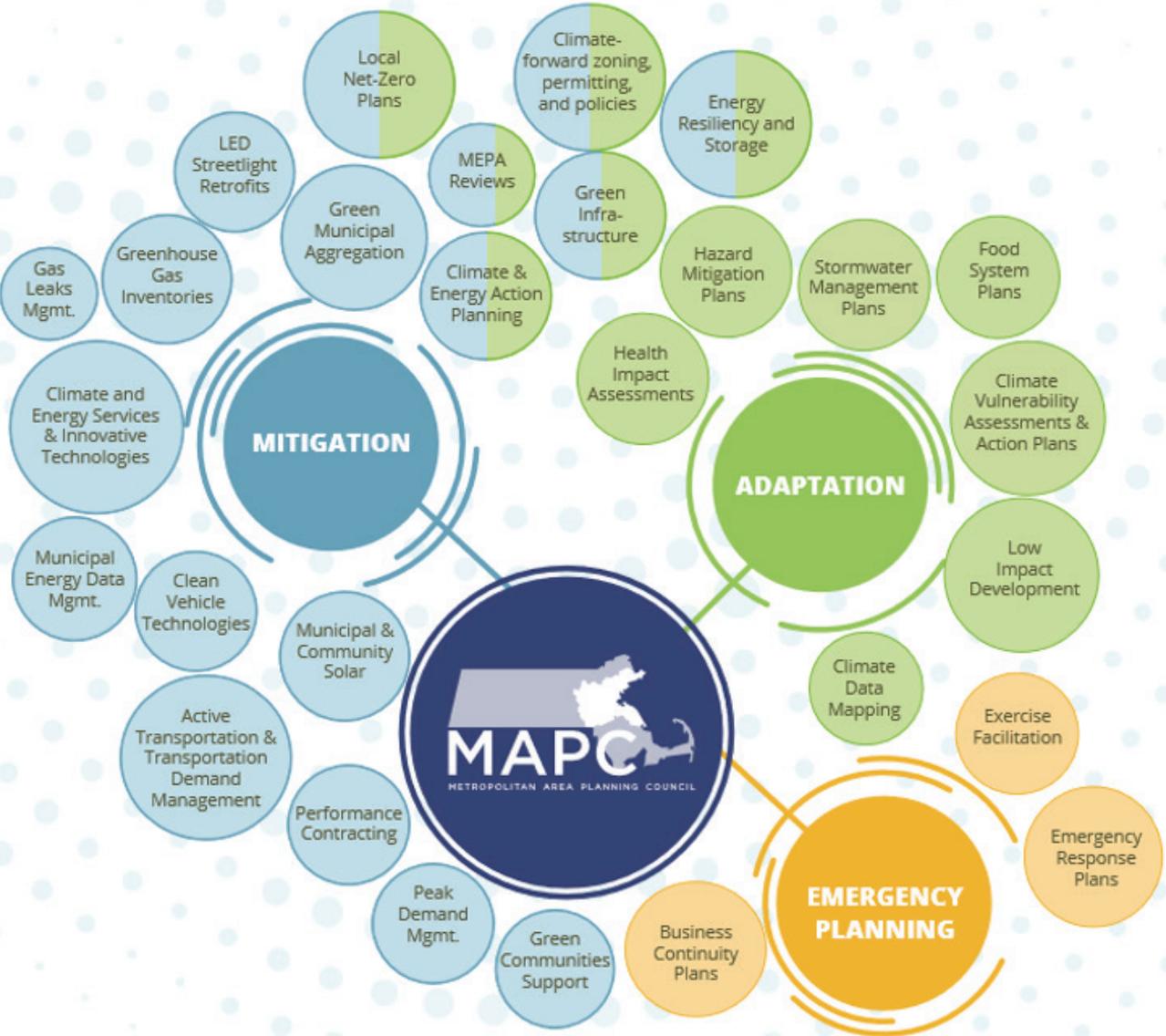
Where we want to be by 2050

A Climate-Resilient Region: Metro Boston is prepared for – and resilient to – the impacts of climate change.

A Net Zero Carbon Region: The Metro Boston region is highly energy efficient and has reduced its greenhouse gas (GHG) emissions to net zero.

A Healthy Environment: Greater Boston's air, water, land, and other natural resources are clean and protected – for us and for the rest of the ecosystem.

Solutions will involve many systems



Action is already starting...

Statewide Policies & Investments

- Global Warming Solutions Act
- Green Communities Act
- Executive Order #569 - Establishing an Integrated Climate Change Strategy for the Commonwealth.
- State Hazard Mitigation and Climate Adaptation Plan

Regional Projects

- Metro Mayors Coalition Climate Preparedness Taskforce and Net Zero by 2050 Commitment
- South Shore Climate Coalition
- MAGIC Climate Resilience Plan
- Multi-Town Gas Leaks Initiative

Community-led Plans and Efforts

- Chelsea Greenroots Project on Community Choice Energy
- MassEnergize - Wayland and Concord organization helping neighbors take climate action
- Marblehead Climate Action Plan Framework
- Cooler Communities Playbook

Municipal Policies and Initiatives

- Climate Ready Boston
- Town of Brookline Emergency Preparedness Buddies Program
- Green Municipal Aggregation
- Net Zero Action Planning in Arlington, Melrose, and Natick
- Newton Climate Action Plan
- Duxbury Climate Vulnerability Assessment
- Watertown Solar Requirement

Why are these hard problems?

- ▶ Mitigating climate change is much bigger than the Boston region. It will require worldwide action. But, there's a lot WE can do.
- ▶ A resilient Metro Boston will require deep collaboration and agile decision-making. Municipalities in the region mostly function independently.
- ▶ Both climate mitigation and resilience will require funding at a time of competing priorities.
- ▶ Our society is organized in ways that maximize energy use – from where we live and work to what is least expensive to eat, wear, and travel by.
- ▶ The racial and other inequities that heighten the climate risks for low income communities and communities of color are deeply embedded.

Adaptation... ▶▶▶▶▶▶▶▶▶▶

Scituate Harbor (2020)

District Master Plan focused on coastal resilience exploring flooding solutions that will impact the entire harbor, and other nature-based solutions, that would have synergies with economic vitality and public realm improvements

Medford Parks & Open Space (2020)

Evaluated the climatic, geomorphological, and environmental conditions of Medford's park system; spatially analyzed how it intersects with key components of the City's infrastructure, vulnerable populations, and ecological resources, and created design recommendations that enhanced climate resilience across Medford.



Mitigation... ▶▶▶▶▶▶▶▶

Ashland (2018)

Leveraging an Energy Services Company (ESCO) procurement, Ashland has developed solar photovoltaic (PV) projects on the Middle School roof, High School parking lot, and a capped municipal landfill.

Somerville (2018)

One of the first communities to commit to a carbon neutral goal, Somerville's Climate Forward plan and Zoning Overhaul promote net zero ready buildings.



What are the key **challenges/opportunities** we'll need to address to reach our goals for 2050?

Challenges:

- **Time scale**
long term, evolving impacts, yet short time to act and need for urgency
- **Scale of need**
significant funding required for old buildings and infrastructure
- **Politics**
global, federal, and under-resourced local
- **Property rights**
managed retreat/dislocation and resiliency on coastlines; disconnect between building owners, insurers, and renters

Opportunities:

- **Technological changes** (e.g. more competitive renewables, teleworking)
- **State, regional and municipal-level leadership**
can collaborate and innovate, stepping into the void left by the federal government
- **Growing consensus and ethic around taking action**
visible and understood threats plus changing demographics, with willingness to act among broader swaths of the population
- **Greener economy**
job creation and healthier, more livable communities

What are the **hard** questions?

- ▶ Who will be most impacted by changes to flood insurance and retreat?
How do we prevent this from perpetuating existing racial and social injustices?
- ▶ Given that renewable energy sources currently provide a small percentage of our supply, how can we realistically shift away from fossil fuels as quickly as possible?
- ▶ How do we make sure our remedies to climate change actively advance a racial and social justice framework? How can our transition to a new economic system dismantle existing societal systems of injustice?
- ▶ How do we pair growth and development with a fossil-fuel-free future?