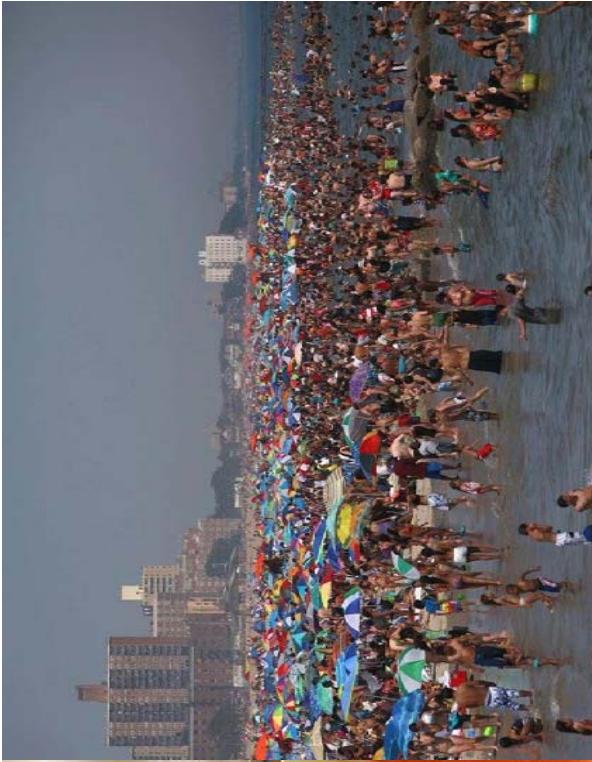


Climate Change Communication Strategies for Vulnerable Populations in Boston

Coastal flooding, urban heat islands and how the impacts of these events are communicated to residents in the City of Boston.



By Natasha White and Chardine Chanel-Faiteau



“While all Bostonians will feel the impacts of extreme weather and increased flooding, the **impacts may be felt hardest in the city’s communities of color and lower-income neighborhoods.** These residents already face a slate of challenges and inequities that will make it **harder to withstand heat waves and bounce back after disasters.**”

-Sandra Larson
Bay State Banner

Abstract

This project will **evaluate** the **effectiveness** of **Greenovate's** climate **communication** strategy and how this strategy is helping to mitigate **environmental impacts**; specifically coastal flooding and urban heat islands, on the City of Boston's socially **vulnerable communities**. **Greenovate** is the City of Boston's comprehensive communication tool that seeks to **inform** the City's residents about the City's Climate Action Plan, and **involve** the City's residents in the mitigation of the impacts of climate change. **Greenovate** intends to equip the City of Boston with knowledge, and **communicate** the importance of climate change impacts and preparedness.

Project Process

CURRENT STATE

Review current Climate Action Plan and Greenovate ASSESSMENT

Assess Greenovate's communication strategy to
vulnerable **communities** **the problems**

BEST PRACTICES

target audience
Review of comparable communication strategies

RECOMMENDATIONS

Make Greenovate the best it can be for Boston



Research Question

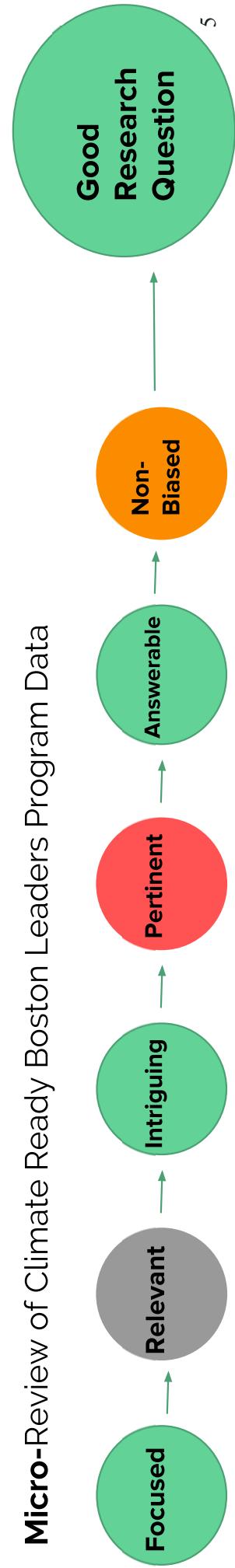
How does Greenovate's climate change communication strategy effectively help to communicate and mitigate the environmental impacts on vulnerable communities?

Goal:

*To evaluate Greenovate's communication strategy through the lens of **efficacy and equity** on two levels;*

Macro-Review of the communication tool-Greenovate Plan

Micro-Review of Climate Ready Boston Leaders Program Data



Current State of Greenovate



*"Greenovate Boston is Mayor Walsh's initiative to **get all Bostonians involved** in eliminating the pollution that causes global **climate change**, while continuing to make Boston a healthy, thriving, and innovative city."*

What Greenovate does

CENTRAL RESOURCE

Serves as a central resource about climate and environment issues in Boston



COORDINATION

Understanding the problems

Between the community and City of Boston to effect policy and program implementation as well as convene and connect the community at large for collective impact

Target audience

INCLUSIVITY

One of their methods of promoting inclusivity is through their Climate Ready Boston Leaders Program; This trains residents to engage with their neighbors, in order to have a conversation about climate

Current Climate Action Plan Priorities

"Climate action in Boston is a priority for Mayor Walsh. Climate change is happening, and promoting the activities that reduce greenhouse gases creates job opportunities and improves quality of life. We must also **prepare our people and infrastructure for a changing coastline and increasing temperatures**, so our City is protected from more intense natural disasters and extreme weather events."

-Climate Action Plan (2015)

CLIMATE ACTION PLAN

A new, more rigorous greenhouse gas measuring and modeling methodology, with a first look towards Boston's 80 percent by 2050 emissions reduction goal.



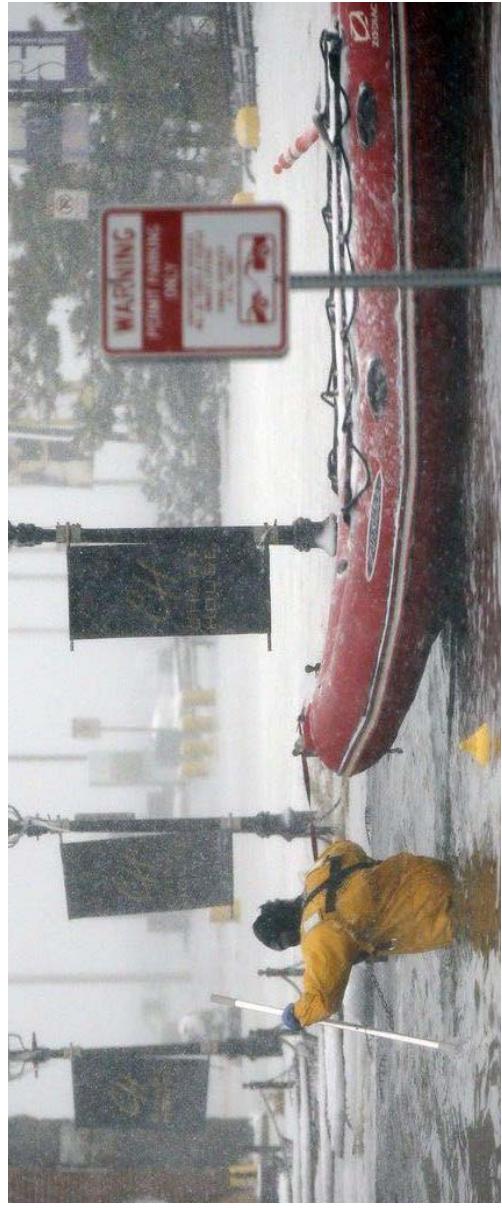
More comprehensive climate preparedness strategies.

An emphasis on key cross-cutting themes of social equity, economic development, community engagement, and public health and safety.

More extensive and inclusive community engagement process.

A new performance measurement system to measure year-over-year progress and keep us on track to meeting Boston's goals.

SOURCE: The City of Boston



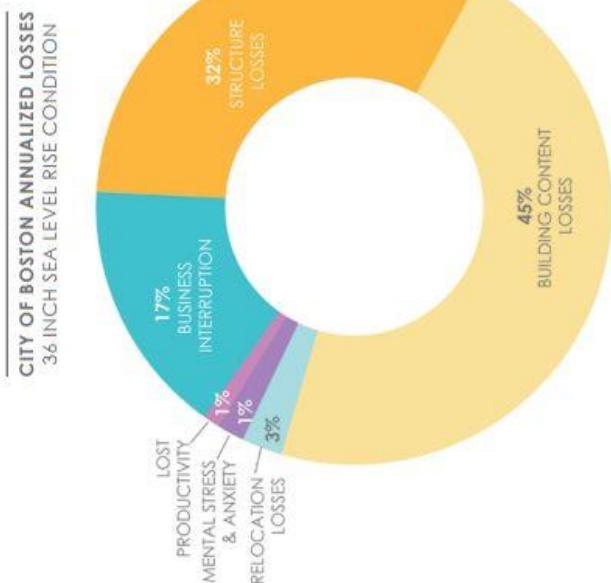


“Boston will **prepare for climate change** by investing City dollars and outside funding to develop more detailed climate plans for Boston neighborhoods, especially those **most at risk for coastal flooding**.”

*-Executive Summary
City of Boston FY19 Operating Budget*

Coastal Flooding Estimates

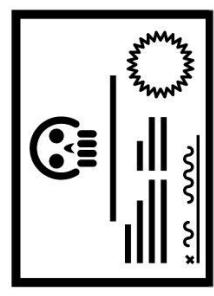
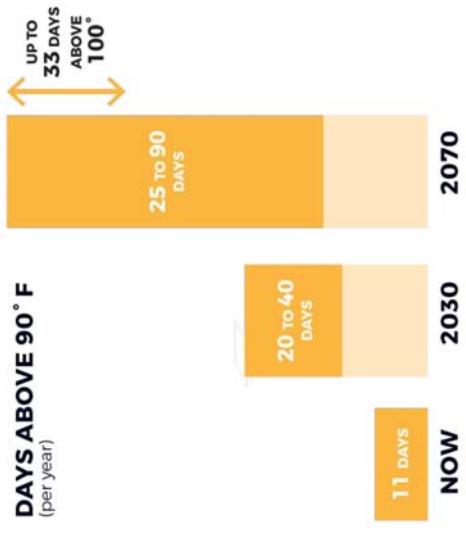
Annualized losses will increase with sea level rise...



Extreme Heat Estimates



**DAY(S) ABOVE 90° F
(per year)**



Mortality per 100,000

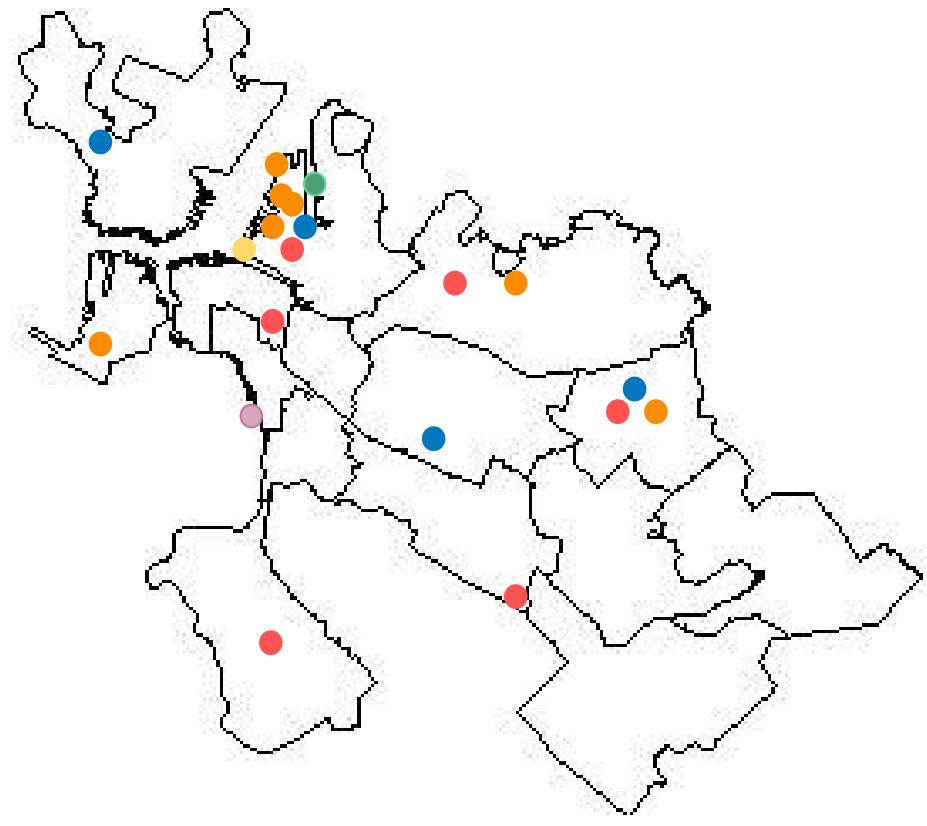
2018 → 18
2020 → 36
2080 → 63
High 2080 → 115

Boston's summers may be as hot as **Washington, D.C's in 50 years**, and like **Birmingham Alabama's in 80**.

Greenovate Outreach

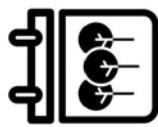


Review Greenovate Outreach 2017 to Present



Let's Talk Carbon Neutrality

Greenovate Boston Earth Day- South Boston
April 2017



Climate Ready Presentations/Open Houses



Listening Session for Transportation-
Downtown, Boston
November 2017



Renew Boston: Energy Efficiency, Heating,
Insulation Workshops

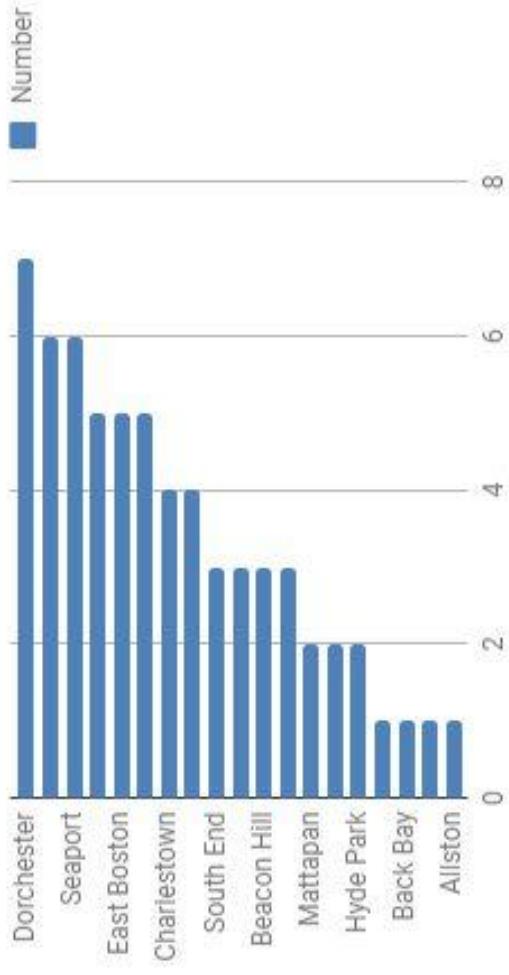


Climate Ready Boston Leader Sessions and
Trainings

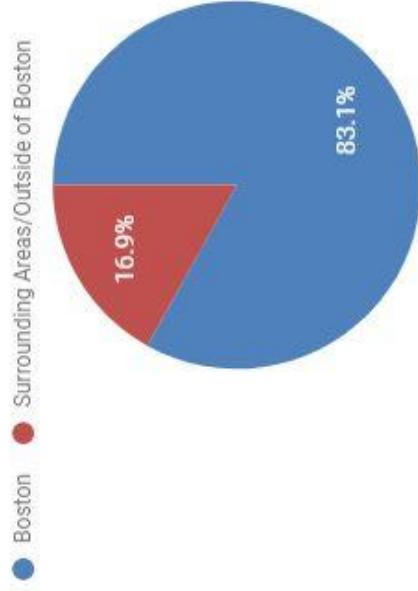


Climate Ready Leader Trainings Cohort One

Climate Ready Boston Leader Trainings-Cohort One



% of Boston Residents that participated in CRBL Training

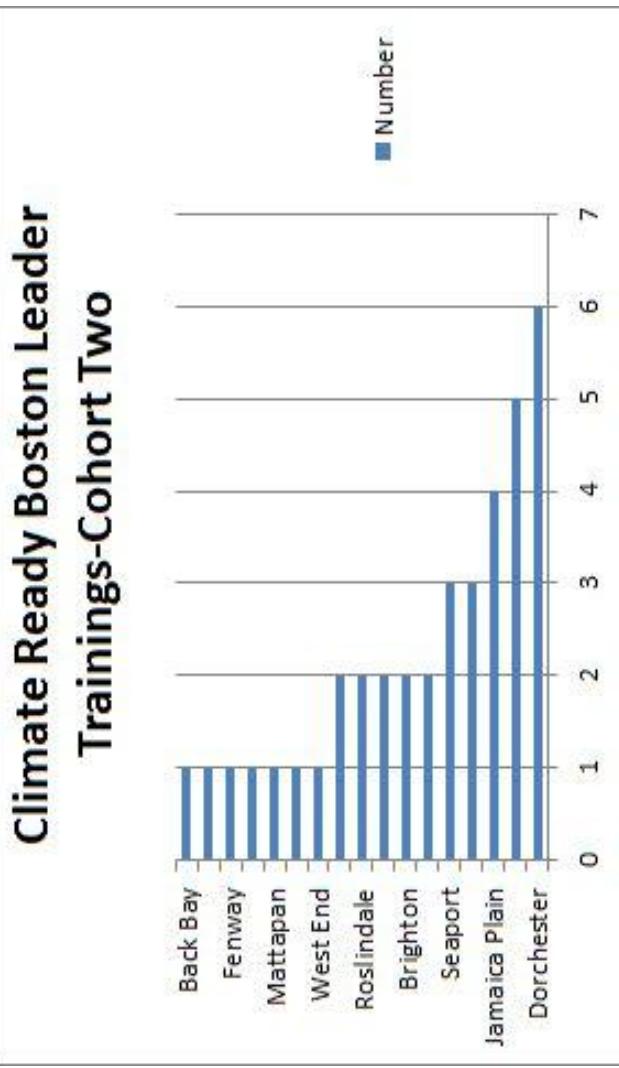
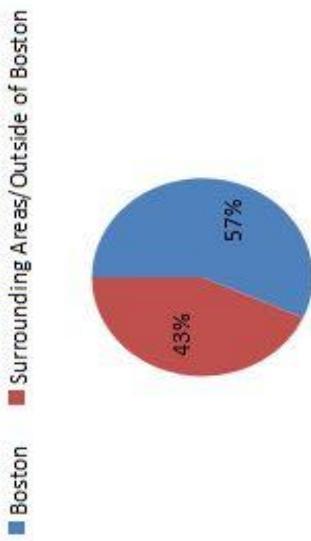


For cohort one, those who were interested in being a Climate Ready Boston Leader had to apply and be accepted into the training program

Climate Ready Leader Trainings Cohort Two

Climate Ready Boston Leader Trainings-Cohort Two

% of Boston Residents that participated in CRBL Training



For cohort two, there was no application process, and it was open to whomever wanted to participate

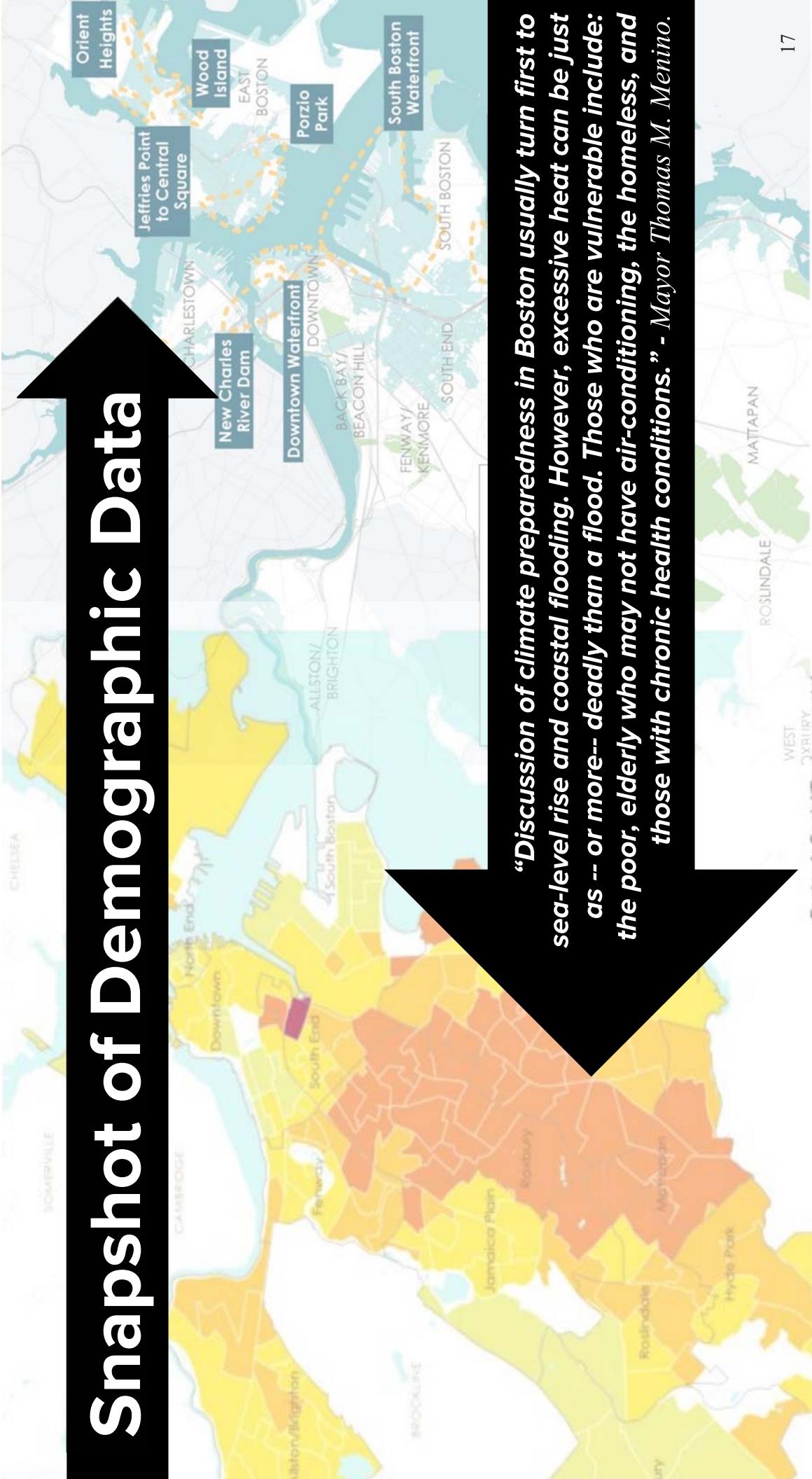
Assessing through lens of equity



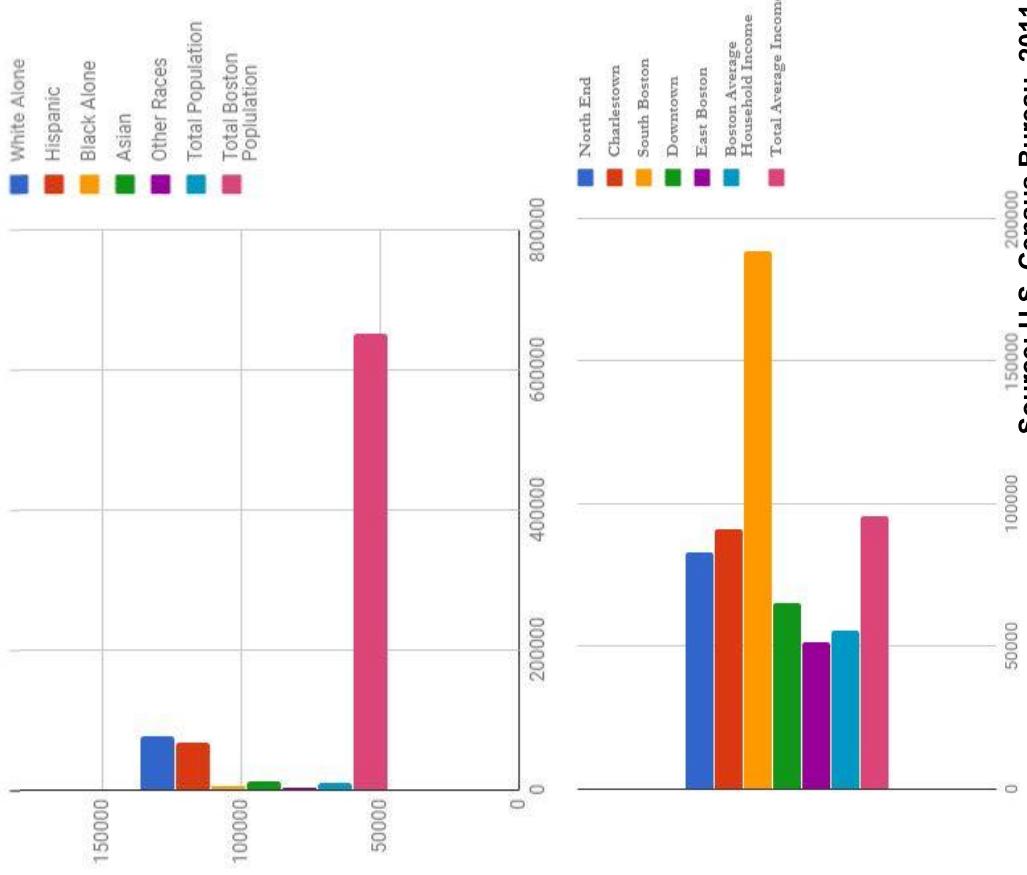
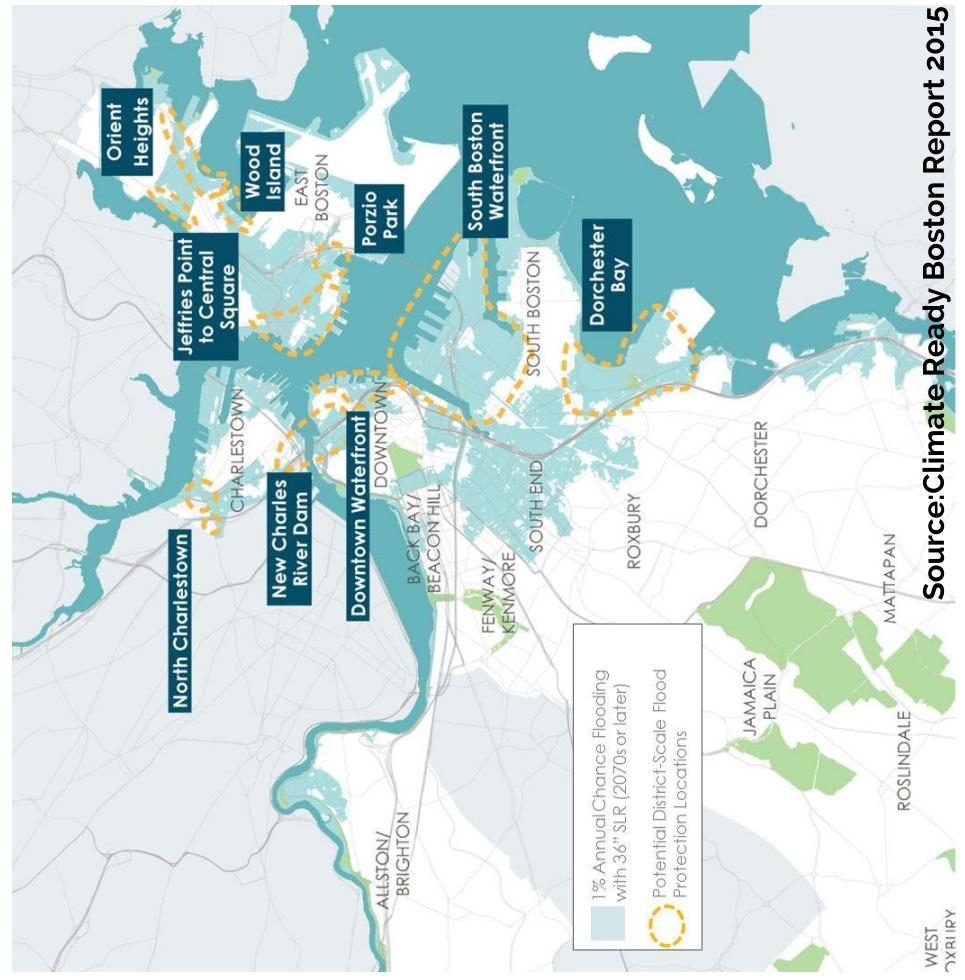
At 11 a.m. one early summer morning, it's a humid 80 degrees inside Fausto Alvarado's third-floor apartment in Chelsea. When it's hot, the 88-year-old from Honduras struggles with every breath. **"I can't get enough oxygen, and I'm very tired," says Alvarado. "I almost can't breathe."**

-WBUR "Urban 'Heat Islands' Are Hotbeds For Health Problems

Snapshot of Demographic Data

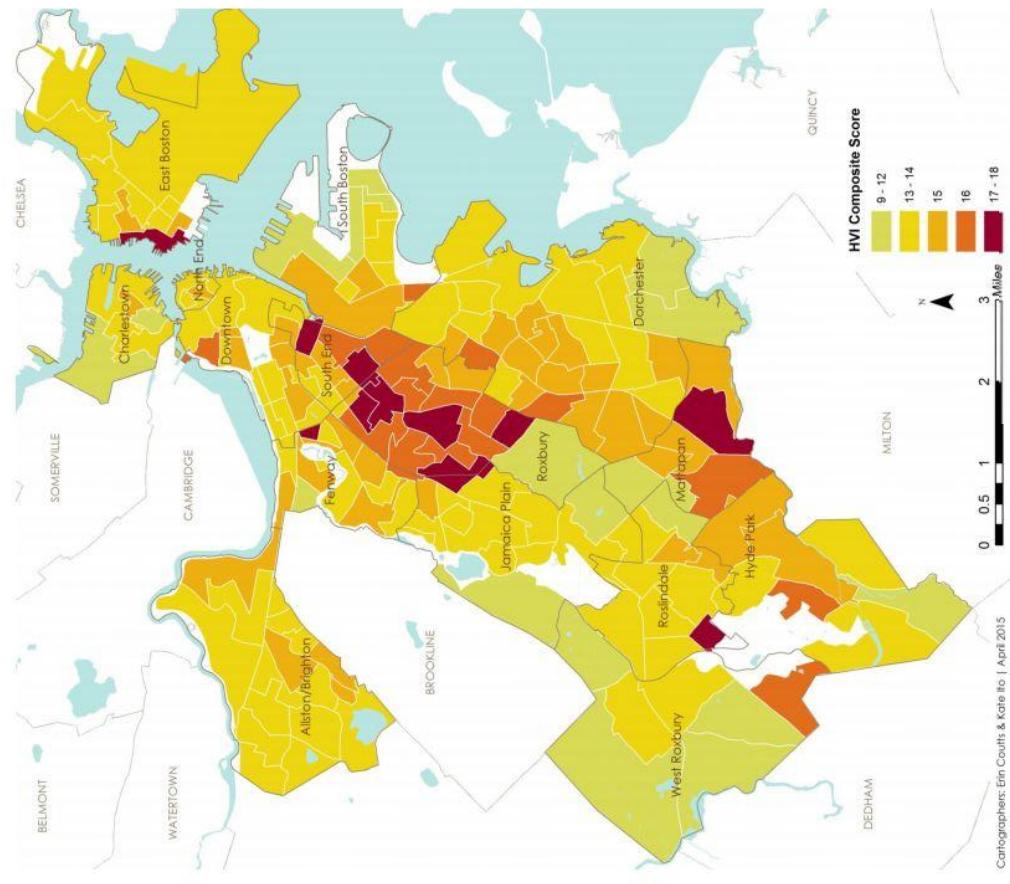


Coastal Flood Zones in Boston

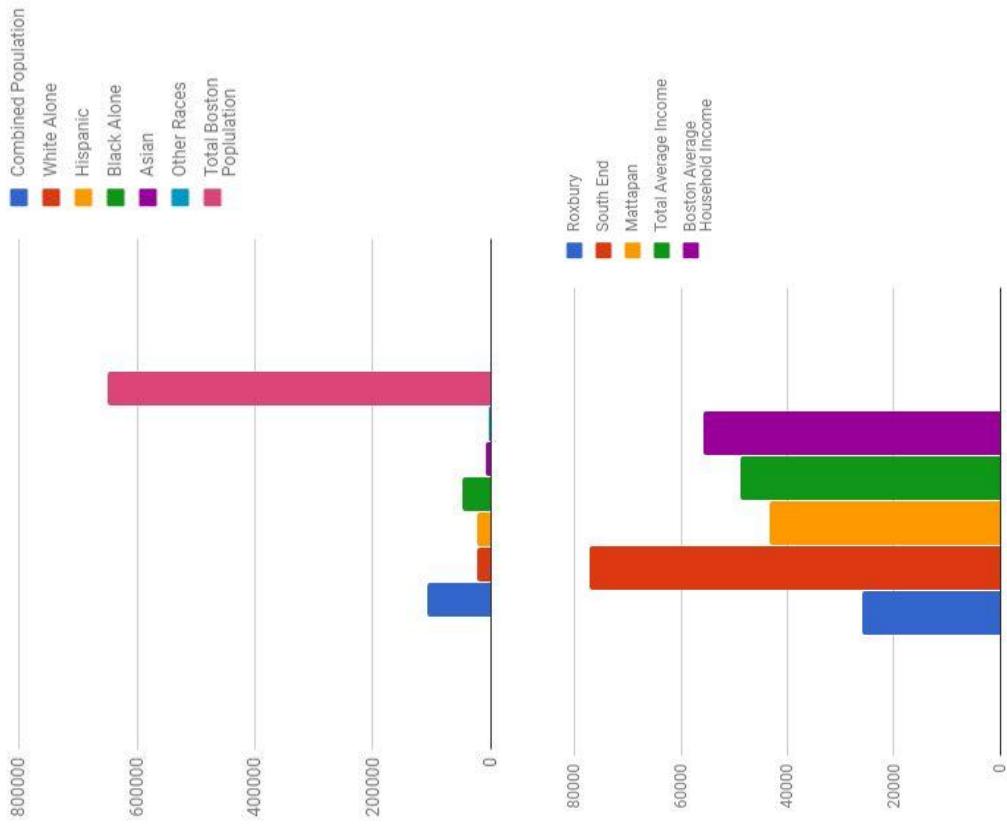


Source: U.S. Census Bureau, 2011-2015 ACS

Urban Heat Island Neighborhoods



Source: The Trust for Public Land



Social vulnerability

Social vulnerability is defined as the disproportionate susceptibility of some social groups to the impacts of hazards, including death, injury, loss, or disruption of livelihood. In this dataset from **Climate Ready Boston**, groups identified as being more vulnerable are **older adults, children, people of color, people with limited English proficiency, people with low or no incomes, people with disabilities, and people with medical illnesses.**



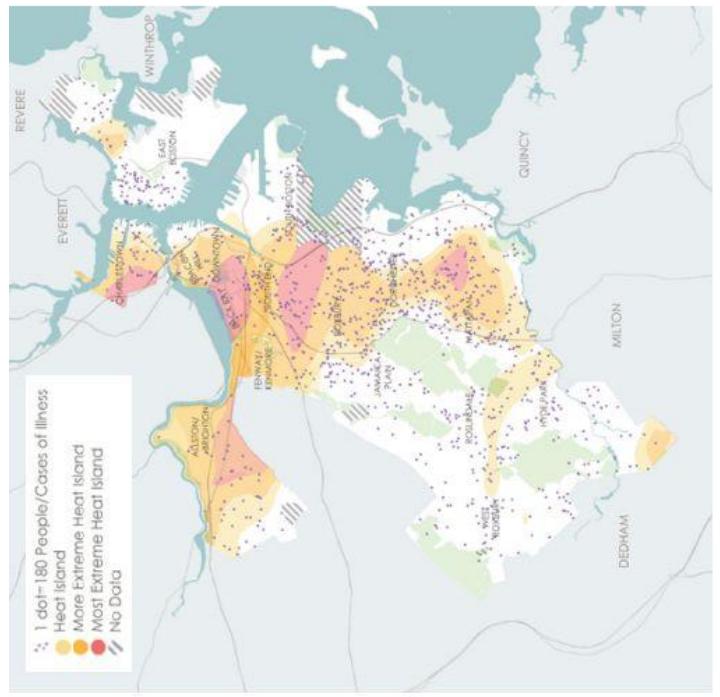
Source: The analysis and definitions used in Climate Ready Boston (2016) are based on "A framework to understand the relationship between social factors that reduce resilience in cities: Application to the City of Boston." Published 2015 in the International Journal of Disaster Risk Reduction by Atyia Martin, Northeastern University.

Social Vulnerability Assessment

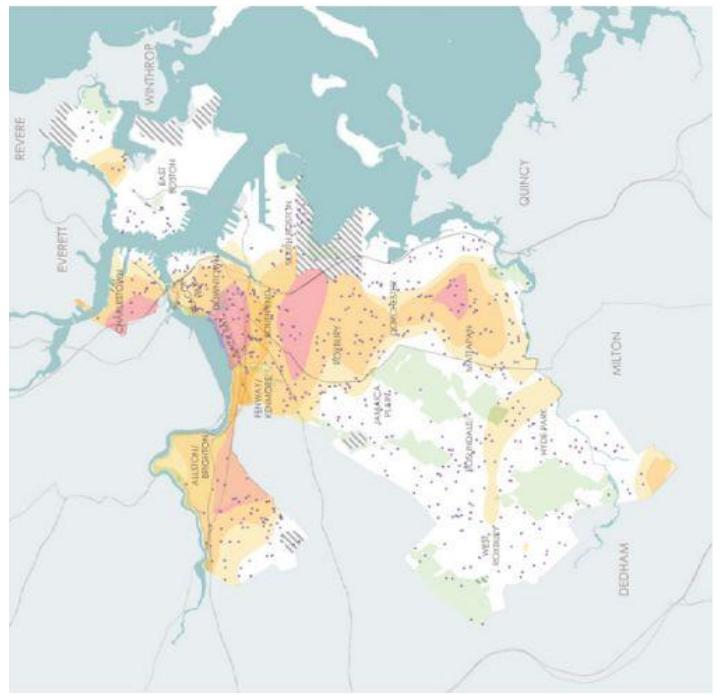
Community	Total Population	Older Adults			Children			People of Color			People with Limited English Proficiency ^{a7}			Low-to No-Income			Disability			Medical Illness ^{a8}		
		#	%	#	#	%	#	#	%	#	#	%	#	%	#	%	#	%	#	%	#	%
Allston/Brighton	75,000	6,100	8%	4,600	6%	25,400	34%	9,700	13%	21,000	28%	6,200	8%	29,200	n/a							
Back Bay/Beacon Hill	22,600	2,800	12%	1,900	8%	3,600	16%	600	3%	2,600	11%	1,000	5%	9,500	n/a							
Charlestown	16,400	1,800	11%	3,300	20%	4,000	24%	1,600	10%	4,200	25%	1,500	9%	6,500	n/a							
Dorchester	87,400	8,500	10%	21,000	24%	62,500	72%	35,100	40%	26,600	30%	12,400	14%	31,800	36%							
Downtown	30,000	4,100	14%	2,000	7%	9,400	31%	4,000	13%	6,800	23%	2,600	9%	12,400	n/a							
East Boston	40,500	4,100	10%	8,700	21%	25,500	63%	17,400	43%	13,700	34%	5,200	13%	14,800	n/a							
Fenway/Kenmore	44,300	2,100	5%	600	1%	14,400	33%	3,700	8%	11,200	25%	2,700	6%	16,000	n/a							
Harbor Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hyde Park	32,300	4,200	13%	7,000	22%	23,200	72%	4,600	14%	5,700	18%	3,800	12%	12,500	n/a							
Jamaica Plain	42,100	4,100	10%	6,300	15%	19,200	46%	4,900	12%	14,500	34%	4,200	10%	16,400	n/a							
Mattapan	33,700	3,900	11%	9,600	29%	32,100	93%	5,800	17%	11,900	35%	6,000	18%	12,500	n/a							
Roslindale	37,700	3,800	10%	7,100	19%	16,700	44%	5,400	14%	6,800	18%	4,100	11%	12,500	n/a							
Roxbury	71,400	5,800	8%	16,700	23%	59,200	83%	11,400	16%	27,700	39%	10,400	15%	24,000	n/a							
South Boston	31,800	3,200	10%	4,900	15%	7,100	22%	2,600	8%	8,200	26%	3,000	9%	13,500	n/a							
South End	38,600	3,300	9%	4,900	13%	16,500	43%	5,800	15%	11,600	30%	4,300	11%	12,800	n/a							
West Roxbury	30,400	5,400	18%	6,100	20%	8,100	27%	3,000	10%	3,500	11%	3,000	10%	12,400	n/a							
Boston Total	634,400	63,200	10%	104,700	17%	327,300	52%	98,200	15%	176,100	28%	70,700	11%	236,900	37%	-	-	-	-	-	-	
Percent of Boston																						

Source: Boston Climate Vulnerability Assessment Report, 2015

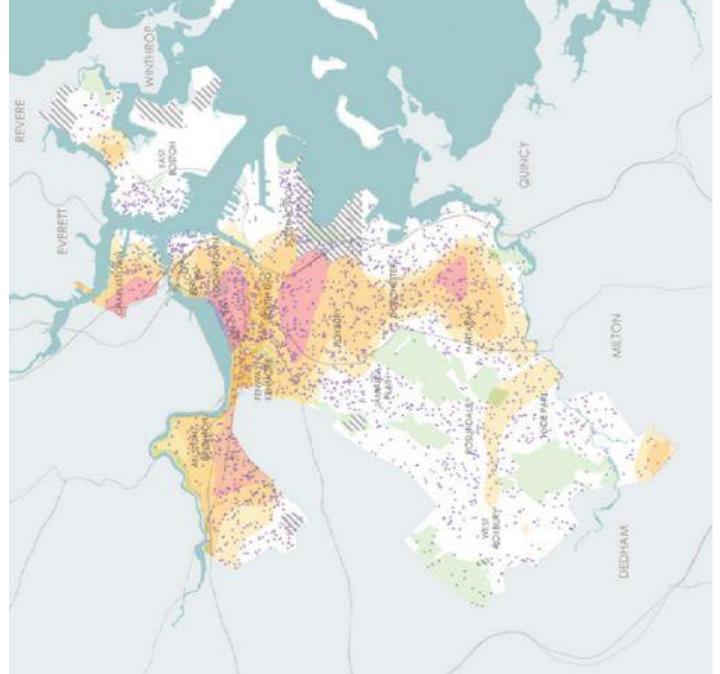
Impact of Extreme Heat on Select Vulnerable Populations



CHILDREN AND HEAT ISLAND EXPOSURE



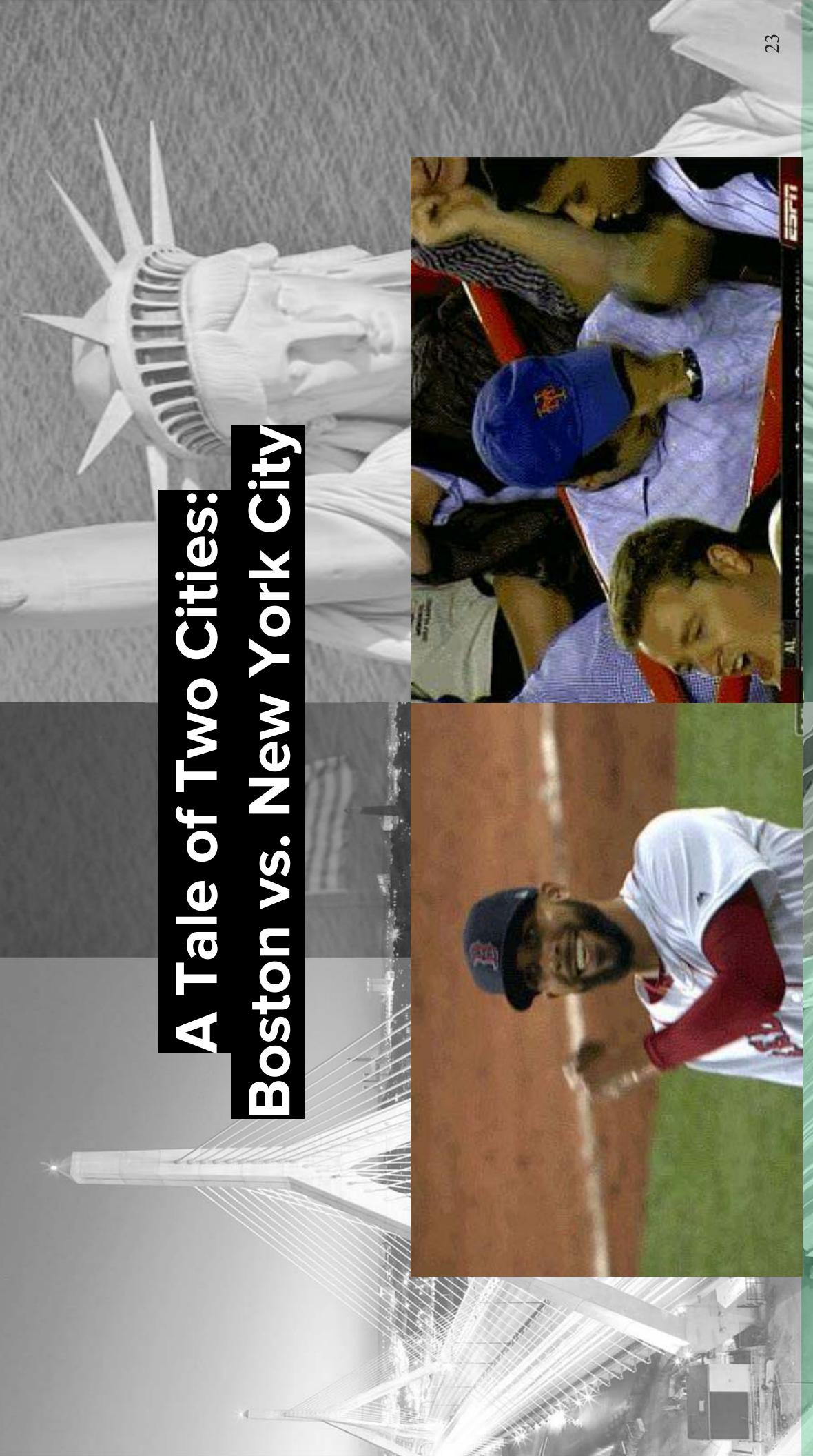
OLDER ADULTS AND HEAT ISLAND EXPOSURE



MEDICAL ILLNESS AND HEAT ISLAND EXPOSURE

Source: Resilient Boston, 2017. City of Boston

22



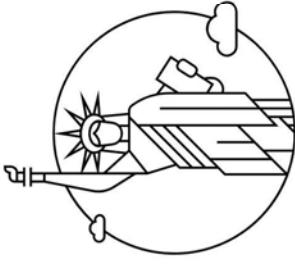
A Tale of Two Cities: Boston vs. New York City

Heat Island Resiliency in New York (Preface)

Periods of extreme heat have a profound effect on human health, including dehydration, heat exhaustion, heat-stroke, and mortality. In New York City, specifically, extreme heat is the number one cause of mortality from extreme weather. **Every year, NYC experiences an average of 450 heat-related emergency department visits, 150 heat-related hospital admissions, and 13 heat-stroke deaths.**



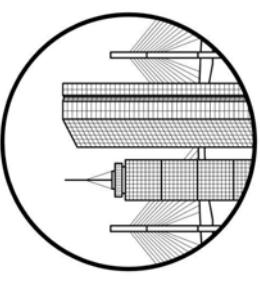
EPA Heat Island Community Actions Database



10 Actions

NYC CoolRoofs – In 2008 New York City put into place a building code that requires most new buildings to have 75% of the roof area covered with a reflective, white coating

Brooklyn Botanic Garden Green Roof – The revamped Brooklyn Botanic Garden unveiled an undulating green roof that will capture and reuse over 200,000 gallons of rainwater each year



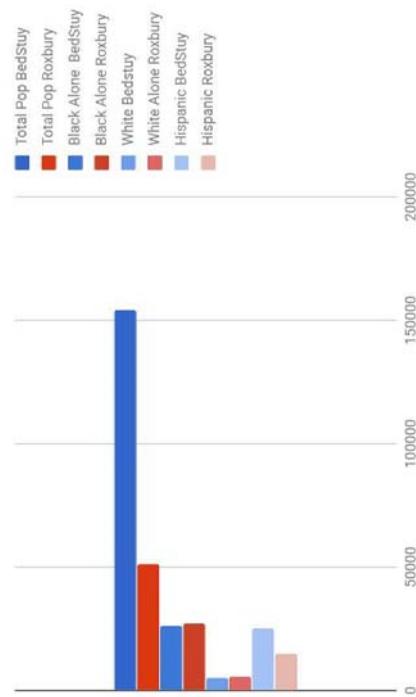
2 Actions

Green Building Zoning Code – Boston is decreasing carbon emissions associated with energy use in privately owned and operated buildings.

A Neighborhood in Comparison

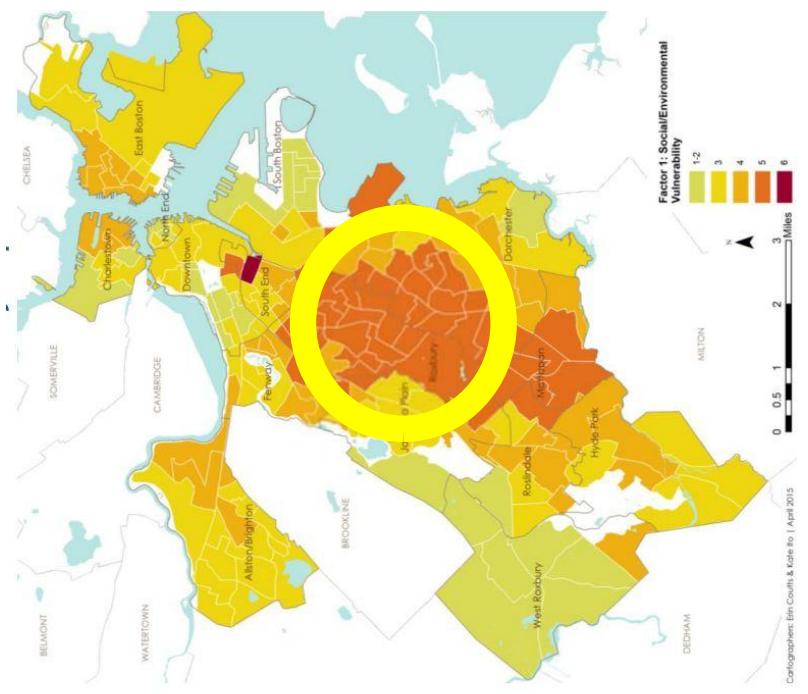
Brooklyn Community District 3
Bedford-Stuyvesant, New York

City Per Capita Income:\$26,665



Roxbury, Boston

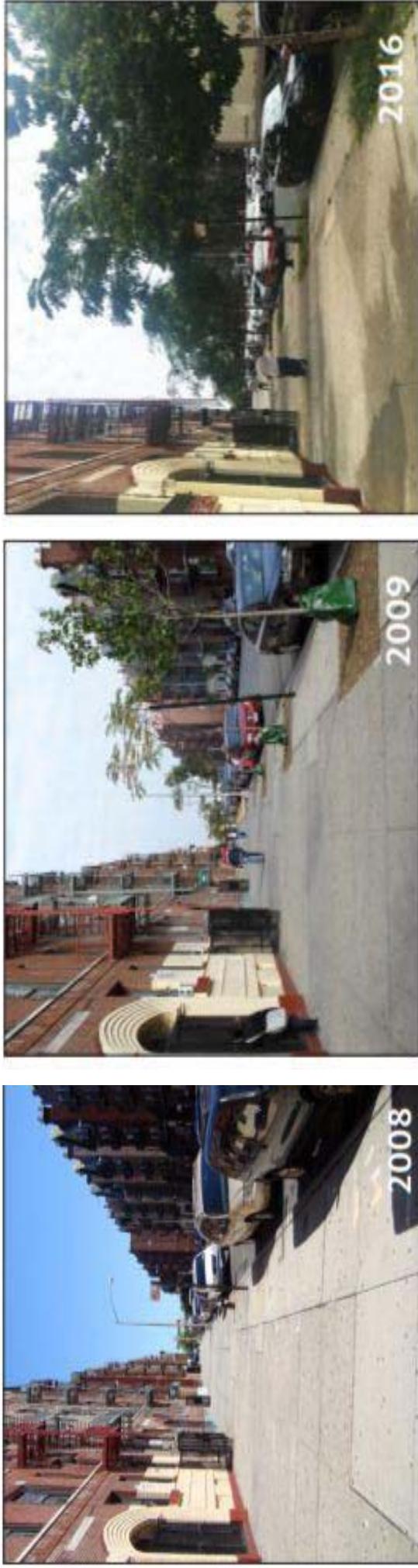
Per Capita Income:\$17,077



Source: Census 2015 ACS

Source: Erin Coutts, 2015

Heat Resilience Mitigation Strategies- Cool Neighborhoods NYC

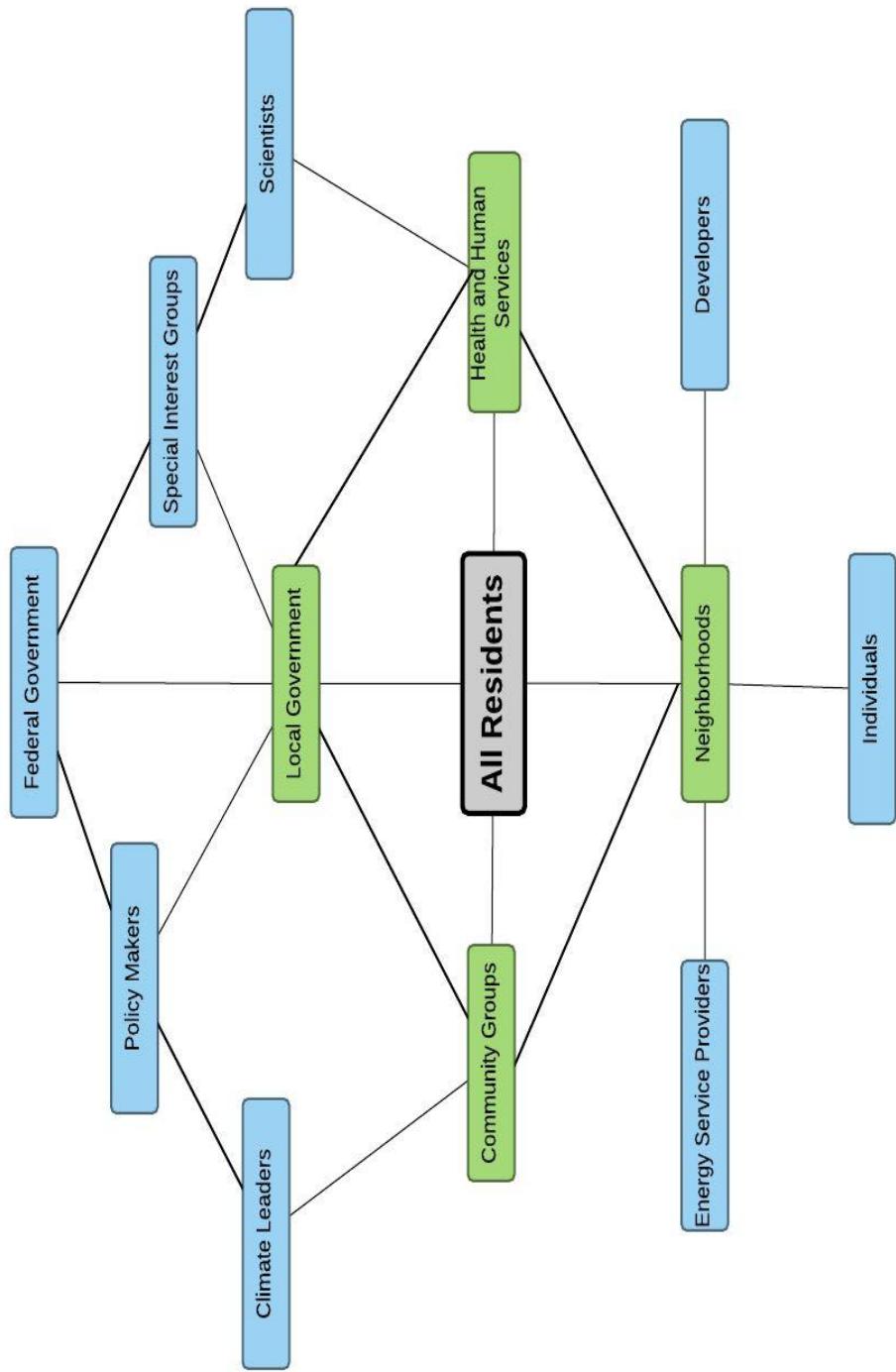


“Linking vulnerable and high-risk populations to strategies for green infrastructure and other nature-based solutions is critical for **increasing equity and addressing environmental justice in the city.**”

In partnership with the University of New York (SUNY) at Buffalo and NYC Mayor’s Office of Recovery and Resiliency, they formed the **Million Trees NYC**, which planted 1 million trees in Urban Heat Island neighborhoods.

Source: Cool Neighborhoods NYC Report 27

Stakeholder Connection: A visual



Stakeholders- How do they connect?

Climate change impacts all

Every resident will be impacted, so an inclusive approach should be taken



Examples of direct stakeholders

Local Government- Boston, neighboring cities

Community groups- NOAH, CDC's Health and Human service providers- Hospitals, schools Neighborhoods- Roxbury and Mattapan, South Boston, Dorchester

Examples of indirect stakeholders

Funders
Policy Makers

Challenges, Policy Recommendations and Proposed Next Steps

“City and regional **policy** makers have worked in recent years to develop **climate resiliency plans**, but they **remain in the preliminary stages**.” -Boston Globe, April 2018

“Climate adaptation also offers a unique opportunity to channel investments in ways that **interrupt persistent inequities** and target local economic development, **community inclusion**, improved housing and infrastructure, and **access** to employment, transportation, and healthcare.

Financing Climate Resilience, UMass Boston, April 2018



Communication Challenges Snapshot

Funding

External funding received was specifically for coastal flooding awareness



Process

Understanding the problems

Creating accessible content and showing prevalence of heat as well as coastal
Target audience

Greenovate resources are not translated into other languages besides english

Sustainability

Retain Climate Ready Boston Leaders

Interview Data

- Lauren Zingarelli was in complete agreement with the City of Boston's **lack of communication and engagement** with vulnerable populations regarding heat islands. Citing that the City has been operating more from an **emergency management point of view** instead engagement and mitigation.
- Lauren also mentioned that Greenovate **provides a budget to the Boston Public Health Commission** to do work around urban heat islands.
- Both Lauren and Alisha have cited that **Boston Public Health Commission** has taken the lead on health aspect of the heat island effect. Over the summer, they had a MIT fellow by the name of Cindy Noe who spearheaded a few extreme heat projects. Some of these projects include:
 - Visiting **elderly locations** to let them know about the City services and cooling centers
 - A traveling **water truck** provided by Boston Water and Sewer Commission
 - Community oriented “urban heat island” games for **community centers**



Lauren Zingarelli, Director of Communications and Community Engagement



Alisha Pegan, Renew Boston Community Outreach Fellow

Policy Recommendations:

Content

Create plans in major languages in the City of Boston

Climate Action Plan 2019: Prioritize addressing urban heat islands

Funding

Seek out funding to ~~specifically~~ address urban heat islands or request that funders contribute a percentage ~~to~~ ~~of the~~ ~~their~~ funding to not only address coastal flooding, but also urban heat islands

Sustainability

Expanded use of existing resources; Water Truck, EMS, Youth Lead The Change (PB)



Policy Recommendations, Cont:

Content

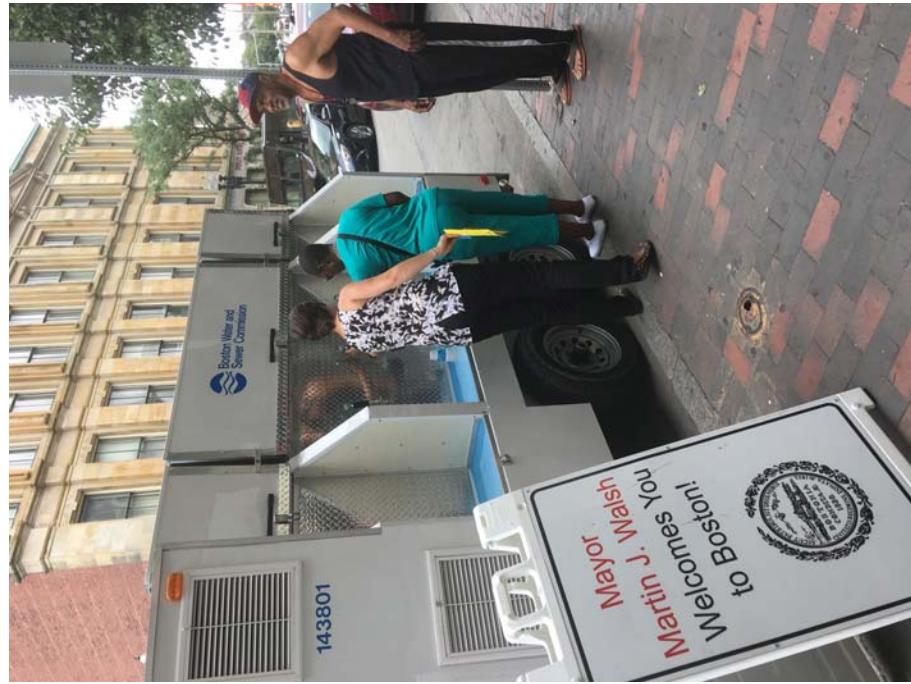
The Greenovate Team and NOAH had a successful partnership in East Boston. Suggest developing an RFP process that would allow Greenovate/Climate Ready Boston to partner with a community organization understanding the problems

Funding

Seek out funding to support dedicated staff target audience

Sustainability

Continue to “train the trainers” as well as go into the neighborhoods



THANK YOU!



Special Thanks to...

Dennisse Rorie

Cindy Noe

Greenovate Team

Dr. Atyia Martin



Sources

<https://www1.nyc.gov/assets/doh/downloads/pdf/data/2015chp-blk3.html>

<https://www.bostonglobe.com/metro/2018/04/12/umass-report-cautions-billions-needed-for-local-climate-change-preparations/yWd2thQxMei8DNzUhrATkM/story.html>

https://www.umb.edu/editor/uploads/images/centers_institutes/sustainable_solutions_lab/Financing_Climate_Resilience_April_2018.pdf

<https://www.bostonglobe.com/metro/2018/01/04/mayor-walsh-sees-climate-change-warning-boston-flooding/916NIJKzM0Y6cOirbyxxXnI/story.html>

<https://bostoncan.org/partners-in-the-climate-protection-movement/>

<https://actionnetwork.org/events/boston-pcm-hub>

https://www.boston.gov/sites/default/files/03_climate_ready_boston_digital_climateprojectionconsensus.pdf

<https://www.thedailybeast.com/bostons-frozen-floods-are-thanks-to-the-supermoon>

<https://www.bostonglobe.com/metro/2017/10/28/boston-plans-strategies-lessen-effects-climate-change/EyKyQMmnzFwkc6z98HIwqnN/story.html>

https://www.boston.gov/sites/default/files/climatereadyeastbostoncharlestown_executivesummary_web.pdf

Sources

- <http://boston.maps.arcgis.com/apps/View/index.html?appid=7a599ab2ebad43d68adabc9a9ebea0e6&extent=-71.1583,42.2897,-70.9309,42.4060>
- https://www.bostonglobe.com/metro/2018/04/12/umass-report-cautions-billions-needed-local-climate-change-preparations/yWd2khQxMei8DNzUhrATkMstor_y.html
- Levy, David L. “Financing Climate Resilience: Mobilizing Resources and Incentives to Protect Boston from Climate Risks.” *University of Massachusetts Boston*. 13 Apr. 2018. www.umb.edu/ssl.y.html
- <http://www.greenviateboston.org/about-us>
- <https://budget.boston.gov/>
- Resilience and Racial Equity, Mayor's Office Of. “Resilient Boston; AN EQUITABLE AND CONNECTED CITY.” <Https://Www.boston.gov/Departments/Resilience-and-Racial-Equity>. 13 July 2017.