



ENGAGING BUSINESSES IN

EXTREME HEAT SOLUTIONS

WELCOME & INTRODUCTION

KATE DINEEN & ISABELLA GAMBILL

TODAY'S PANELISTS



Zoe Davis City of Boston



Rev. Vernon Walker Communities Responding to Extreme Weather (CREW)



Dr. Megan Sandel Boston Medical Center



Bianca Bowman GreenRoots



Professor Patricia Fabian Boston University

TODAY'S MODERATOR



David Sittenfeld Museum of Science



ZOE DAVIS

CITY OF BOSTON

HEAT RESILIENCE SOLUTIONS FOR BOSTON

Preparing for the near-term and long-term impacts of extreme heat

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Climate Ready Boston, preparing for the impacts of climate change



In 2016, the City of Boston released the Climate Ready Boston report, which included a comprehensive vulnerability assessment of current and projected risks associated with each of three climate hazards under a low, medium, and high greenhouse gas emissions scenario.



CCCM Green Ribbon DECEMBER 2014



A holistic approach to citywide climate resilience



Why is heat risk significant?

- Boston is already experiencing the effects of climate change.
- Extreme heat is the number one cause of weatherrelated deaths in the US
- We will experience longer and more frequent extreme heat events.

Historic Trends

- In MA, temperatures have increased by 3.5°F since the beginning of the 20th century.
- In Boston, we typically experience ~ 10 days over 90 degrees.

Future Heat Projections

- By 2070, it's likely Boston will around 130 days over 80°F each year.
- By 2070, it's likely that Boston will have up to around 60 days over 90°F each year.



Boston could experience over 60 days of temperatures above 90 degrees per year by 2070s.



Extreme temperatures in Boston_

Daytime Air Temp (3 PM)



Heat Event Duration



Heat Resilience Solutions for Boston (the Heat Plan) is a citywide framework to prepare Boston for hotter summers, with particular focus on Boston's environmental justice neighborhoods.



Equitable heat resilience means putting people at the center.



Developing the Heat Plan



Preparing people, buildings, infrastructure, and the public realm to withstand extreme heat events.

HEAT EXPOSURE

The amount of heat people, the environment, systems, or other elements experience or are subject to. Exposure considers both heat intensity and duration.

HEAT SENSITIVITY

The degree to which people, the environment, systems or other elements are affected by exposure to heat.

ADAPTIVE CAPACITY

The ability to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with consequences. 25 strategies to increase access to resource and reduce localized extreme temperatures.



Opportunities to support heat resilience strategies



Opportunities to support heat resilience strategies



Opportunities to support heat resilience strategies



REVEREND VERNON WALKER

COMMUNITIES RESPONDING TO EXTREME WEATHER



Climate Impacts in Greater Boston

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Communities Responding to Extreme Weather (CREW) www.climatecrew.org



About Us



Better Future Project works to build a powerful grassroots movement to address the climate crisis and advance a rapid and responsible transition beyond coal, oil, and gas toward a renewable energy future for all.

We have three programs:

• 350 Mass • CREW



CREW is a young **grassroots organization** that aims to build equitable, inclusive neighborhood **climate resilience** in New England through hands-on **education, service,** and **planning**.

www.climatecrew.org



Extreme Impact in Boston & Greater Boston

HEAT

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More Heat

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2055 - 2084

(2070)



Above 90°F - High Scenario

Above 100°F - Low Scenario

High 100°F - High Scenario

*Summer is considered to be the 91 days of June through August

(2030)





Weather Fatalities 2021



Due to an inherent delay in the reporting of official heat fatalities in some jurisdictions, this number will likely rise in subsequent updates.



Urban Heat Island

 Neighborhoods with little tree cover, few grassy areas and a lot of concrete can be as much as 15 to 20 degrees hotter than the surrounding areas.

The urban heat island effect amplifies a heat wave's already-oppressive temperatures: areas with a lot of asphalt, buildings and freeways tend to absorb the sun's energy then radiate heat. Areas with green space — parks, rivers, tree-lined streets — absorb less.



What social and psychological impacts will we expect to see?





The Psychological Effects

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Hurricane Katrina as a Case Study

- Up to 54% of adults and 45% of children suffer depression after a natural disaster.
- 49% of Hurricane Katrina survivors developed an anxiety or mood disorder.
 - 1 in 6 developed PTSD.
 - Suicide and suicidal ideation more than doubled.
- Outside of the United States, the suicides of 60,000 Indian farmers over the past three decades have been directly linked to climate change.
 - An increase of 5 C (9 F) on any given day was linked with 335 deaths.



The "Crumbling Community" Effect

INDIRECT IMPACTS Climate change can affect the way we think about ourselves, each other, and the world.

After a climate event or resulting displacement, people may experience a diminished sense of self, difficulty relating to others, diminished social interaction, and solastalgia (the loss of a sense of place, solace, and security tied to one's physical environment). Community impacts include domestic abuse, child abuse, and violence (e.g., assault and civil conflict). Economic insecurity and physical damage are other potential effects.

COOPERATION: Establish social ties and connections with community members. This will help to withstand changes and encourage adaptation.



So: What does CREW do with all of this?









Making a Plan

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• **Cover windows** with drapes, shades, or aluminum foil-covered cardboard.



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- Avoid exercise.



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- Wear loose, lightweight, light-colored clothing.



- Cover windows with drapes, shades, or aluminum foil-covered cardboard.
- Find cool places in your community.
- Never leave a child, adult, or animal alone inside a car on a warm day.
- Avoid exercise.
- Wear loose, lightweight, light-colored clothing.
- Check-in on neighbors.



DR. MEGAN SANDEL

BOSTON MEDICAL CENTER









Connecting Energy and Health

Why We Must Address Energy Insecurity at the Patient, System and Structural Levels

Megan Sandel MD MPH September 7, 2022

Roadmap

- 1. Energy Insecurity as a foundational need for patients to thrive
- 2. Upstream Solutions to Energy Reduction as a Health System
- 3. How do you use Place Based approaches to Policy Change to address Energy Insecurity



Energy is a Foundational Social Factor



An interpretation of Maslow's Hierarchy of Needs





Energy Factors Are Not Organic But Designed



Social Determinants of Health are the structural factors and conditions in which people are born, grow, live, work play pray and age.



Understanding Energy and Health requires understanding Structures, Social Determinants of Health and Inequities





Changing Social Drivers of Energy Insecurity at Many Levels



Promoting Health Equity Through Screening, Systems, and Policy work as Anchor Institution

> CHILDREN'S HealthWatch



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Identifying and sharing SDOH needs is a critical component of our ACO work and the THRIVE Screener allows us to advance this effort

THRIVE SCREENER Addressing Social Determinants of Health									the	the following		
Please fill this out and give to the medical assistant when you are called into the exam room. Your answers will help your care team take better care of your health and connect you with resources. Thank you!									Housing			
	Please check "√" your answers:									Food		
	What is your		have a steady pla	ave a steady place to live						Affording		
	living situation today?	on O	I do not have a steady place to live (I am temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)						•	Transpor		
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٢	Do you have trouble paying for medicines? O Yes O No								provides their referral guid			
۲	Do you have trouble getting transportation to medical appointments? $~$ O $_{\text{Yes}}~$ O $_{\text{No}}$											
\bigcirc	Do you have trouble paying your heating or electricity bill? O Yes O No											
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Ì	Are you currently unemployed and looking for a job? O Yes O No											
Are you interested in more education? O Yes O No								seamlessly				
	Pleas	e chec	k "√" the r	esourc	es you w	ant help	with:					
Housing Shelter	/ Food Pa	ying for ledicine	Transportation to medical	Utilities	Child care / Daycare	Care for elder or	Job search/	Education	•	Positive s		
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os us **assess patients' needs** in domains:

- medications
- tation

- Utilities ٠
- Caregiving
- Employment
- **F**ducation

ages patients by asking if they nnecting to resources and m with immediate access to **les** available in six languages*

r & referral guides are integrated into the clinic's Epic workflow.

- creens prompt ICD-10 codes
- d referral guides print in the room



Reducing our Energy Use as a Health System

- First hospital-based rooftop farm
- Goal = carbon-neutral by 2030 (96% there)
- Invested in partnership with MIT on 650 acre solar-farm to help power campus



Reducing our carbon footprint—healthier hospitals, healthier people.



Supporting Resilience through Local Food Sourcing, Place-based Investing in BIPOC Wealth Creation and Local Job Development

We can leverage our everyday business practices to **impact economic factors** that contribute to the overall well-being of our communities, and **create community wealth through**:

Inclusive, Local Hiring

Building the Pipeline to a Healthy Community

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Inclusive, Local Hiring: Building the Pipeline to a Healthy Community

This toolkit offers a guide for how to leverage hiring practices to advance inclusive, local job creation and career development for communities experiencing the greatest health and wealth disparities.

Inclusive, Local Sourcing

Purchasing for People and Place

Series Inc. A construction of the series of

Inclusive, Local Sourcing: Purchasing for People and Place This toolkit showcases examples of how hospitals and health systems are supporting diverse and locally owned vendors and helping to incubate new community enterprises to fill supply chain gaps and drive local economic growth in their communities.

Placebased Investing

Creating Sustainable Returns and Strong Communities

Contract Contraction Contractions and

Place-Based Investing: Creating Sustainable Returns and Strong Communities

This toolkit outlines place-based investing strategies that allow health systems to earn a financial return on their investments while producing a positive social, economic, or environmental impact within their geographical service areas.





BOS Collaborative Investing in Housing AND Commercial Wealth building In Transit Oriented Housing Developments



A New Grocery Store in Nubian Square: **NUBIAN MARKET** A Halal Supermarket





We are aligning our Community Health Initiatives with Health Equity Accelerator priorities around Housing, Energy and Economic Mobility



BOS Collaborative

Housing Initiative

THRIVE

Financial Health

Leading a new community-driven place-based approach to open pathways to employment and affordable housing and create new investing strategies to support wealth creation. Our housing initiatives rooted in **policy change**, **community partnerships**, and **housing investing**, to create stable, affordable housing, resulting in more consistent health and stable well-being Our THRIVE program is a wide-spread **SDoH screener** that identifies social needs of our patients – one of the most common areas patients want help is in employment and education opportunities. Health is Wealth! Expanding financial coaching allows BMC to address wealth building to our patients and other community members



BOS Collaborative is leading a *Systems Change* approach in a *Place-Based* way that will inform geography of Community Health Initiative









BIANCA BOWMAN & DR. PATRICIA FABIAN

C-HEAT PROJECT

GreenRoots and C-Heat in Chelsea & East Boston: Mitigating urban heat in low income immigrant communities

Bianca Bowman, Climate Justice Organizer, GreenRoots **Patricia Fabian**, ScD, Associate Professor of Environmental Health, Boston University School of Public Health



Neighboring Environmental Justice, immigrant communities

Chelsea, MA

- Smallest city in MA (2 sq mi)
- 50,000+ residents
- 73% ethnic minorities
- 24% below poverty line

East Boston, MA

- 5 sq miles, with 3 miles used by the airport
- 55,000+ residents
- 53% Latino
- 17% below poverty line

80% impervious surfaces









Ambient Sensors vs. National Weather Station Chelsea & East Boston

Daily averages on a hot week 6/22/21-7/1/21

 The overall <u>maximum daily ambient</u> temperature was 5.7°F hotter in Chelsea/East Boston than at the National Weather Station at Logan Airport.

 Ambient temperature for 20 sensors installed in Chelsea and East Boston Ambient temperature at the National Weather Station at Logan Airport

GreenRoots



ENVIRONMENTAL AND SOCIAL JUSTICE



GreenRoots works to achieve environmental justice and greater quality of life through collective action, unity, education and youth leadership across neighborhoods and communities.

C-Heat Project



The Chelsea East Boston Heat Study (C-HEAT) is a partnership between Environmental Health researchers Boston University School of Public Health (BUSPH) and GreenRoots, Inc.



"Cool Block" Project

✤ C-Heat

Temperature sensor placement 2022





- "Cool block"
 - Collaboration between C-Heat, GreenRoots, City of Chelsea



Cool block collaboration









Intergenerational community-led design processes for new green spaces and cooling-focused parks





C-Heat Photovoice Project





Broadway St. near Carry Ave. on Saturday around 1:30pm. Absolutely no protection from the sun. The person waiting at the bus stop and the person in the wheelchair (and who's pushing the wheelchair) are sweltering in the sun. It definitely sheds light on the need for protection in the City.

Broadway St. Near Carry Ave. el sábado alrededor de las 1:30pm. Absolutamente ninguna protección del sol. La persona que espera en la parada del autobús y la persona en la silla de ruedas (y que empuja la silla de ruedas) están sofocando al sol. Definitivamente arroja luz sobre la necesidad de protección en la Ciudad.





This picture is at Quigley park on Essex St. at 7:30am 8/23. You can see the green fire hydrant that throws out water when it is extremely hot, and there is the new water tower in the background as well! This is useful for kids and adults. The kids are usually seen playing with the hydrant but since it is cloudy and cold there wasn't anyone. The water tower is accessible to anyone. This picture to shows the community that there is accessible water to cool off with and drink.

Esta foto está en el parque Quigley en Essex St. a las 7:30 am 8/23. Puede ver la boca de incendios verde que arroja agua cuando hace mucho calor, jy también está la nueva torre de agua en el fondo! Esto es útil para niños y adultos. Normalmente se puede ver a los niños jugando con la boca de riego, pero como está nublado y hace frío no había nadie. La torre de agua es accesible para cualquier persona. Esta imagen muestra a la comunidad que hay agua accesible para refrescarse y beber.



Data Dashboard

census tract (buildings, roads, parking lots, brick, asphalt, concrete).

- Elderly - % population aged 65 and older (ACS 2014-2018)

 Children Under Aged 5 - number of children under the age of 5 (ACS 2014-2018)

 Outdoor Workers - % population working outside (MAPC 2019)

 AC Types in East Boston - air conditioning status for residential housing in East Boston, including no air conditioning, central air conditioning, and ductless air conditioning (City of Boston Assessing Department)

 Window Unit AC in Chelsea - buildings with AC window units, as recorded in Summer 2018 (Petropoulos et al. 2020)

 AC Types in Chelsea - parcel data on AC type for Chelsea, including central air, heat pumps, window units, or no AC (Real Property Data from the City of Chelsea for 2020)

Social Vulnerabilities

Environment

https://www.c-heatproject.org/datadashboard



Current work

- Quantify the impact of cooling strategies (e.g., white roofs, trees, cool pavements) on local temperatures and neighborhood heat islands
- Investigate barriers to participation in decarbonization & weatherization
 programs
- Compile state and federal policies to adapt to extreme heat
- Characterize occupational heat exposures

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Twitter, Instagram: @c_heatproject Website: c-heatproject.org



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Special thanks to all the C-HEAT Study participants, Victor Tiernan and Alex Train with the City of Chelsea, and Bell.



Las flores de mi jardín me hacen pensar en mis hijas. Nacen, crecen, son cuidadas con cariño. Pienso mucho en ellas con respecto al cambio climático.

A menudo se oye el comentario: "Qué planeta le dejamos a nuestros niños?

Pero yo me pregunto: "Qué niños le dejamos al planeta?.

Es importante educar a las siguientes generaciones. Todos tenemos la responsabilidad de frenar el cambio climático, e incluso pequeños cambios pueden hacer grandes diferencias! "

The flowers in my garden make me think of my daughters. They are born, they grow up, they are cared for with affection. I think about them a lot in regards to climate change.

You often hear the comment: "What planet do we leave to our children? But I ask myself: What children do we leave to the planet?

It is important to educate the next generations. We all have a responsibility to slow down climate change, and even small changes can make big differences!


DAVID SITTENFELD

Q&A

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CLOSING REMARKS

ISABELLA GAMBILL

THANK YOU



