

BROWNFIELDS ARE SO HOT RIGHT NOW

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COMMUNITY LATTICE

Fifth Ward, Houston | WBE Certified

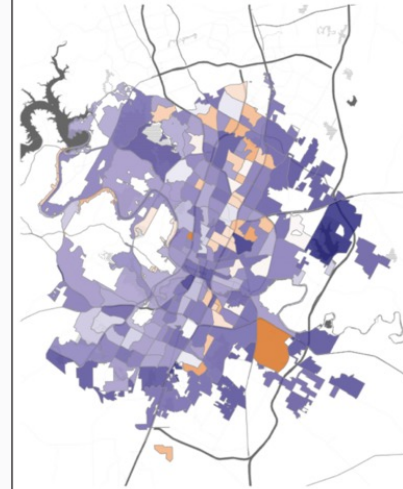


Community Lattice is a woman-owned, social enterprise founded on a mission to drive change land revitalization policies and practices to respond to the real-time and real-world needs of disadvantaged communities.

- Data science for social and environmental impact
- Community engagement and capacity building
- Brownfield redevelopment and environmental
- Environmental justice consulting

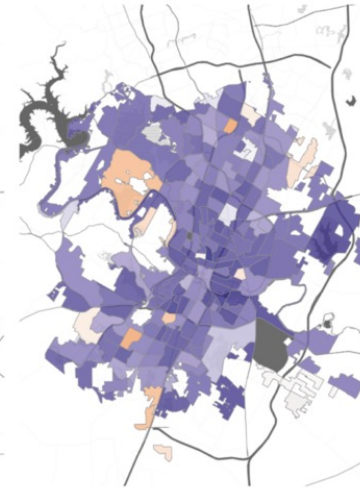


Population Change 2013-2018



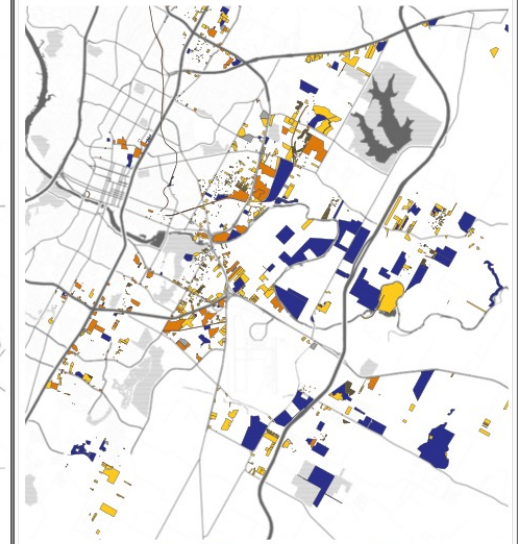
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Income Change 2013-2018



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Potential Brownfields Parcels



Env Concern EPA EPA & Tank Tank Undeveloped

INTRODUCTION

- Extreme heat: A key weather-related killer in the U.S.
- In 2070, in only 51 counties in the US the heat index will be held below 100°F almost all year round.
- Unequal heat impact on disadvantaged communities
- Urban challenges: Infrastructure protection and resource management
- Role of brownfields in urban resilience
- Brownfields redevelopment: A potential solution

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UNDERSTANDING THE IMPACT OF EXTREME HEAT

- Extreme heat causes more deaths annually than any other weather-related hazard in the U.S. (National Weather Service)
- Number of heat-related deaths during 2018-2020: 3,066 (National Vital Statistics System, Multiple Cause-of-Death Data, 2018-2020)
- A team of researchers at the [National Bureau of Economic Research](#) has found evidence suggesting that if greenhouse gas emissions are not curbed, **future heat waves** could kill millions of people across the globe.



UNDERSTANDING THE IMPACTS OF EXTREME HEAT

- Extreme heat goes beyond fatalities, leading to a range of health issues.
- Heat exhaustion and heatstroke are common heat-related illnesses that can occur when the body overheats.
- Individuals with pre-existing medical conditions, such as heart disease or respiratory disorders, are more vulnerable to heat-related complications.
- Heat can cause dehydration, which can further impact overall health and well-being.
- Extreme heat can also contribute to respiratory problems, such as worsening asthma symptoms, and increase the risk of cardiovascular issues, including heart attacks and strokes.



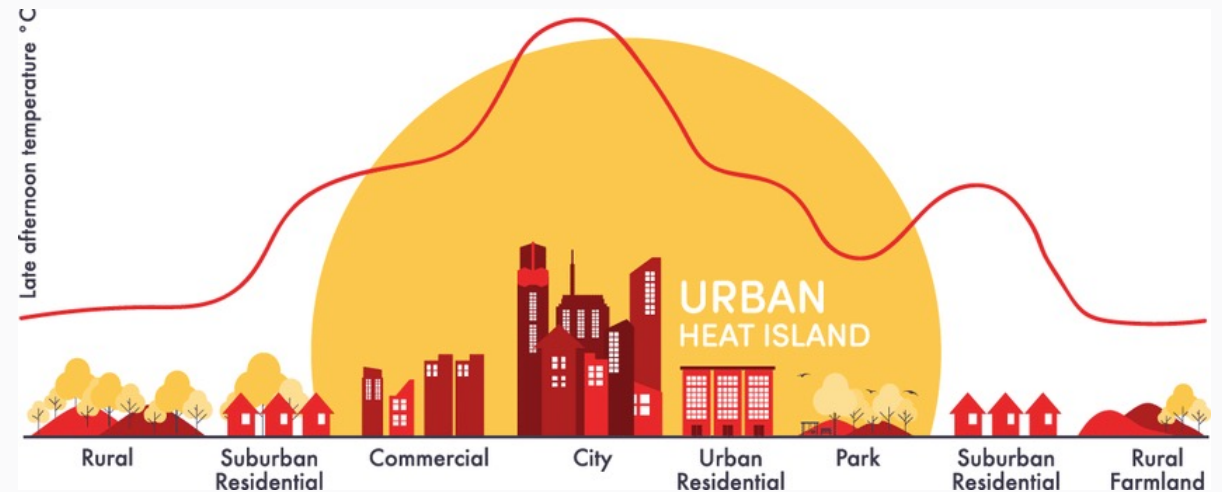
ADDRESSING HEAT INEQUITIES

- Disadvantaged communities experience higher vulnerability to heat-related impacts.
- Factors such as socioeconomic status, limited healthcare access, and inadequate infrastructure contribute to heat disparities.
- Health disparities and limited resources further exacerbate vulnerability.
- Lower income and poor housing can impede heat mitigation efforts and limit adaptability. Additionally, nearby brownfields can endanger residents' health, causing cancer, brain damage, birth defects, and cardiovascular issues due to exposure to contaminants. [Brownfields and Public Health | US EPA](#)



BROWNFIELDS AND URBAN HEAT ISLANDS

- The Brownfields significantly contribute to the formation of urban heat islands.
- Characteristics, such as dark surfaces and lack of vegetation, lead to heat absorption and retention, intensifying local temperatures.
- Research and data consistently support the correlation between brownfields and increased heat in urban areas.
[Kazmierczak PTP Interface 140115.pdf \(cardiff.ac.uk\)](#)
- Proximity to brownfield sites has been associated with higher surface temperatures and reduced cooling capacity.
- Considering heat in brownfields redevelopment is crucial for creating more resilient and livable communities.



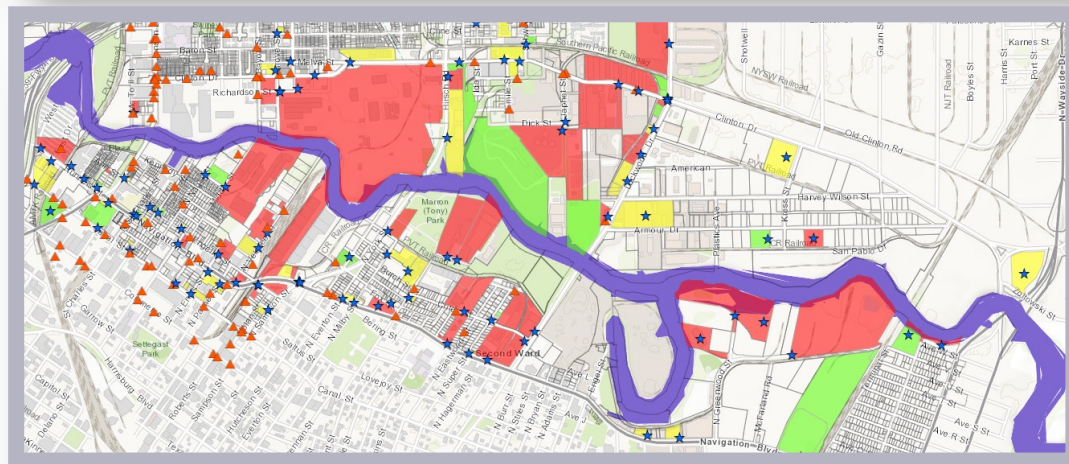
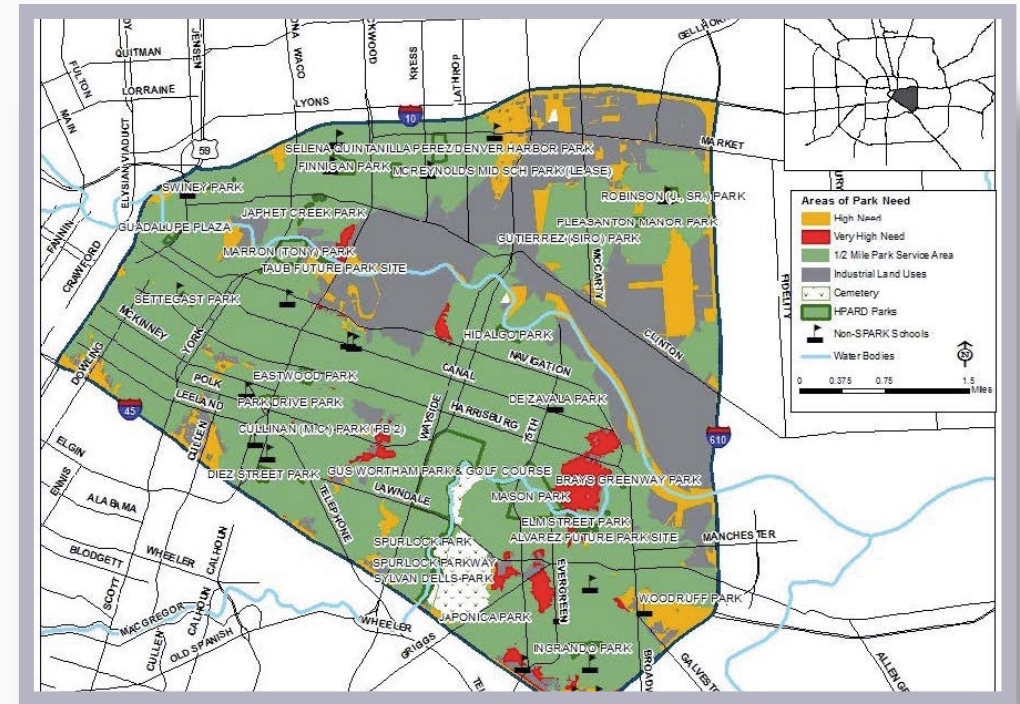
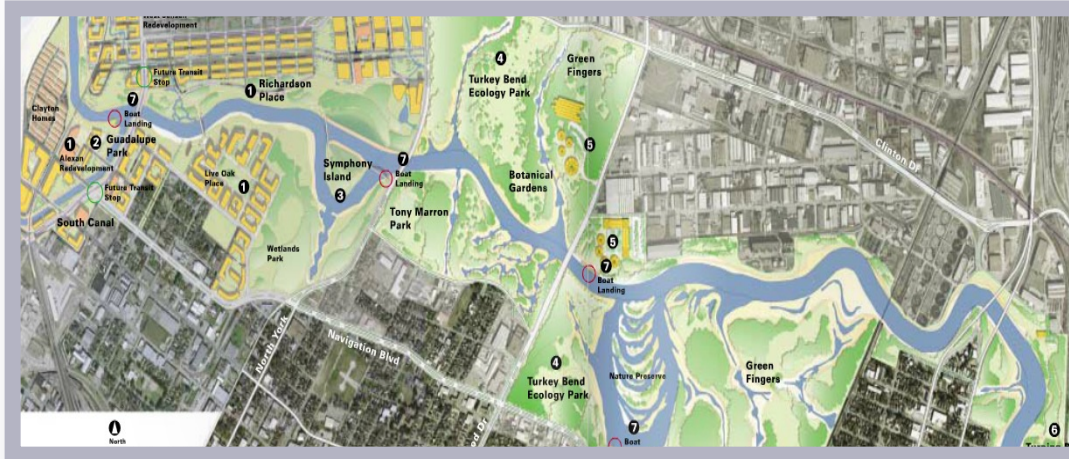
[UHI Mitigation Plan \(airquality.org\)](#)

URBAN RESILIENCE AND BROWNFIELDS

- Cities face multifaceted challenges when it comes to brownfields and extreme heat.
- Brownfields, underutilized or contaminated lands, pose risks to public health, strain infrastructure, and contribute to environmental degradation.
- Extreme heat exacerbates these challenges, with brownfields often acting as heat-absorbing areas and intensifying the urban heat island effect.
- Urban planning plays a crucial role in addressing these issues and integrating brownfields into heat mitigation strategies.
- By strategically redeveloping brownfields, cities can create climate-resilient spaces, reduce heat island effects, and improve overall environmental quality.



BROWNFIELDS CASE STUDIES



Buffalo Bayou Park – Buffalo Bayou Partnership



BUFFALO BAYOU PARK PROJECT

- **Purpose:** The Buffalo Bayou Partnership's mission is to revitalize the Buffalo Bayou area, turning it into a dynamic and vibrant community and event space.
- **Community Focus:** The project seeks to foster community engagement and interaction, creating an inclusive space for all demographics.
- **Heat Mitigation:** The project includes heat mitigation strategies to ensure the area is comfortable and safe during periods of extreme heat. This might involve the use of shade structures, water features, and plantings.
- **Climate-Resilient Design:** The Buffalo Bayou Partnership aims to create a climate-resilient park system. Design elements will be selected for their ability to withstand and adapt to extreme heat conditions.



LANDBANK CONCEPTUAL REUSE PLANNING

Extreme Heat Mitigation

- Climate adaptation: Green roofs can help to mitigate the effects of climate change, such as extreme heat and flooding.
- Urban heat island mitigation: Green roofs can help to reduce the urban heat island effect, which is the phenomenon where cities are warmer than surrounding areas.

Health, Tax, Social

- Health: Green roofs can improve human health by reducing heat stress and providing a place for people to relax and enjoy nature.
- Tax: Green roofs may be eligible for tax breaks in some jurisdictions.
- Social: Green roofs can improve social cohesion by providing a shared space for people to gather and connect with nature.



COMMON HEAT MITIGATION STRATEGIES

- **Green infrastructure and urban greening:** Integrating parks, green spaces, and urban forests to provide shade, evaporative cooling, and manage stormwater runoff.
- **Cool roofs and reflective surfaces:** Utilizing cool roof technologies and applying reflective coatings on building surfaces to reduce heat absorption and minimize energy consumption for cooling.
- **Passive cooling and natural ventilation:** Designing buildings with optimal orientation, cross-ventilation, and shading elements to maximize natural airflow, minimize direct sun exposure.
- **Water management and cool water features:** such as rain gardens and bioswales, to manage stormwater and reduce heat buildup.



IMPORTANCE OF ATTENTION TO EXTREME HEAT IN URBAN PLANNING

- Adapting to climate change and increasing resilience to heatwaves
- Creating sustainable and livable cities for future generations
- Promoting equitable access to heat mitigation resources and strategies



RISKS OF IGNORING EXTREME HEAT IN BROWNFIELDS

- Increased heat-related health risks for future occupants
- Poor indoor thermal comfort
- Heat-related illnesses and discomfort
- Negative impact on energy consumption and costs
- Higher cooling demands and increased energy usage
- Escalated utility costs for residents and businesses
- Reduced resilience to climate change impacts
- Limited adaptive capacity to future heatwaves
- Lack of comfortable public spaces and recreational areas



Source: EPA

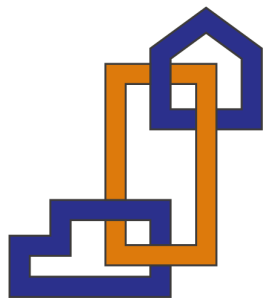
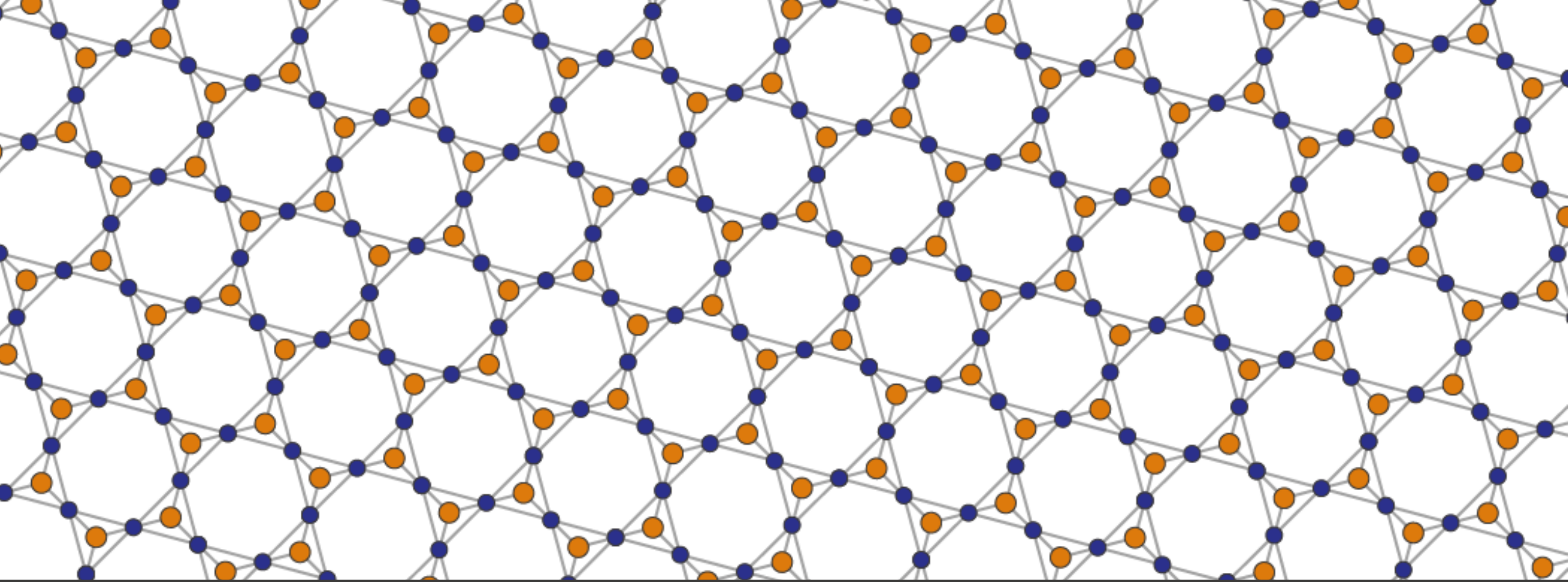
FUTURE IMPLICATIONS

- Broader implications of extreme heat and brownfields redevelopment:
 - Environmental justice and equitable heat mitigation strategies
 - Long-term impacts on community health and well-being
 - Integration of climate resilience in urban planning
- Potential future research directions:
 - Assessing the effectiveness of heat mitigation strategies in brownfields redevelopment
 - Exploring innovative technologies for heat reduction in urban environments
 - Examining the socioeconomic and health disparities associated with heat and brownfields



CONCLUSION

- Extreme heat is a leading cause of weather-related deaths in the United States, and disadvantaged communities bear a disproportionate burden.
- Brownfields programs and redevelopment projects offer actionable opportunities to address heat-related challenges and achieve urban resilience.
- Integrating heat mitigation strategies in brownfields planning is essential to mitigate risks to human health, protect public infrastructure, and manage water and energy consumption.
- Brownfields contribute to urban heat island effects, amplifying extreme heat in affected communities.
- The integration of heat mitigation strategies, such as green infrastructure and cool surface materials, can have numerous benefits, including improved public health, energy efficiency, and climate resilience.
- It is crucial to prioritize equity, environmental justice, and community engagement in brownfields redevelopment and heat mitigation efforts.
- Future research should focus on assessing the effectiveness of heat mitigation strategies, exploring innovative technologies, and understanding the socioeconomic and health disparities associated with heat and brownfields.
- Continued attention to extreme heat in urban planning is essential to adapt to climate change, create sustainable communities, and promote equitable access to heat mitigation resources.



THANK YOU

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