Newspaper Article Features

This summer, we worked with Banana Kelly, which provides affordable housing for residents of the South Bronx. They are working on creating a free print newsletter that can be distributed in their buildings, and we were tasked with creating content on the environmental justice lenses that we chose. We each wrote 6 newspaper features, which will be published in Banana Kelley's inaugural print newsletter to be delivered to residents.

I started off my first article with outlining the urban heat island effect, and the different ways cities across the world are approaching solutions, such as cool roofs, green corridors, and community initiatives, and how these heat strategies can also have indirect positive effects on building community. My next article pairs well with the first one, because it talks about how these solutions could also be a bad for existing communities, which is called green gentrification, which occurs when low-income areas may get more tree coverage, but to their own detriment. This urban canopy is also an amenity, which drives the current population out and brings higher-income residents to these nicer areas.

My third and fourth articles focused on ways that people can get cool in the summer, such as public pools and cooling centers. When I was talking to residents, one of the biggest issues was getting access to cooling centers. One story that I thought was interesting is one of the residents mentioned that she chooses to go to a local White Castle instead of a cooling center, since it's closer to her and easier to get to. It is really interesting to see how, then, food connects with heat in this case. With the cooling centers, then, I wanted to make a map that showed all the cooling centers in the area, since the NYC government map is only active during heat waves.

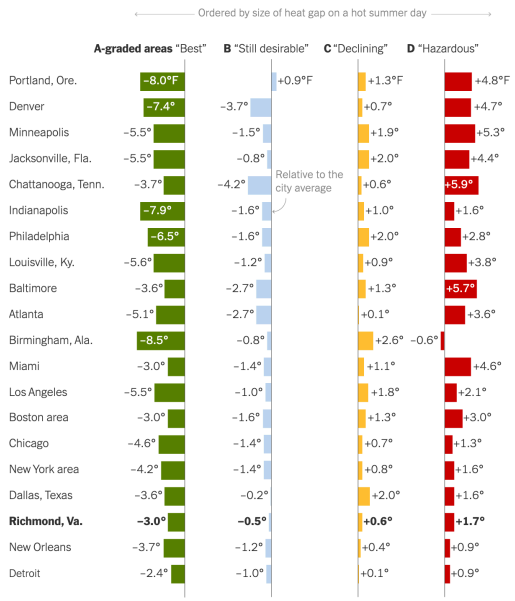
Then, my fifth article featured the Be a Buddy program, which is an awesome program through the Point that pairs volunteers with at-risk residents to make sure that they are able to get to a cooling center during a heat wave. This is really important, because people are usually unprepared for a heat wave, which puts them at even more of a risk. This leads well into my last article, which was a feature on Refreshing Waters, which is the cooling center that Interboro design on Tiffany Street. I had a wonderful chat with Georgeen, one of the co-founders of Interboro Partners and the leader of the Refreshing Water Cooling Station, about the cooling center, and learned a lot about how central community is to design. I think that the cooling center is so unique because it really incorporates community and plays on the things that are already there, rather than just being placed inside it.

These articles are a valuable way of sharing information with residents of the South Bronx. They are already aware of these issues in their community, but by bringing them to the forefront, they are reminded of how these topics can appear in everyday life. Looking forward, I am excited to see how the print production goes and the resident feedback on the articles.

Feature 1:
The Future of Heat: Rethinking Decades of Systemic Inequality

Extreme heat is the most dangerous type of severe-weather event, killing around 12,000 Americans every year. The effect of extreme heat, though, is unsurprisingly unequal.

The South Bronx: A History of Inequity
In the Upper East Side, New York's richest neighborhood, the average surface temperature (the temperature of air near the ground) is 96 degrees. In Hunts Point, on the other hand, the temperature is 100.8 degrees.



The South Bronx handles almost a third of New York City's waste and, as a result, has one of the highest concentrations of truck traffic in the city, piping in hot exhaust to the already sweltering community. Hunts Point has long been a part of the city with one of the lowest parks-to-people ratios and, to add, there are further barriers for people who want to install air conditioners in public housing. Residents must apply for approval and pay an annual fee for each air conditioner they put in their homes.

Hunts Point is one of the NYC neighborhoods with the highest risk of heat-related deaths. This is no coincidence. Neighborhoods demographically similar to the South Bronx, with concentrations of low-income people of color, in cities such as Baltimore, Dallas, Denver, Miami, Portland can be 5 to 20 degrees Fahrenheit hotter in summer than the wealthier parts of the same city.

Community members have voiced their struggles. A resident in the Melrose Houses says that, since she is unable to afford an air conditioner, spends 90-degree afternoons outside against her doctor's orders. She suffers from heart disease, and her granddaughter suffers from asthma. Another resident, who has been living in the Andrew Jackson Houses for 30 years, has high blood pressure and, due to a recent eye surgery, has trouble getting around. Yet, she waits inside until the sun sets to venture out to the closest bodega or supermarket, and keeps her air conditioner on despite the expense.

The Urban Heat Island Effect: A Worldwide Phenomenon
The urban heat island effect, which occurs when cities replace land cover with pavement, buildings, and other surfaces that absorb and retain heat, can make a city 2 to 5 degrees warmer during the day, and up to 22 degrees warmer at night than surrounding suburbs. Since the city has a higher heat storage during the day, the lack of evaporative cooling in the city is somewhat

mitigated; at night, the heat flow reverses, heating the air instead, which is compounded by the heat of the next day. The temperature difference during the night is especially dangerous, as the body needs this time to cool down during the night. In turn, people lose water and salt from sweating during prolonged exposure to high temperatures, and can experience symptoms of heat exhaustion including muscle cramps, weakness, dizziness, headaches, nausea, fainting—and even death.

Cities across the world are seeing the drastic effects of extreme heat. For the past 60 years, every decade has been hotter than the last. Texas, the only state with its own power grid, recently experienced a blackout that left 69 percent of the state without electrical power for almost 42 hours. 115-degree days are becoming increasingly common in Arizona. For residents, this means using less power to avoid more deadly failures in Texas, or facing the question of paying the rent or the electricity bills in Arizona.

In response, many cities are enacting change locally in response to soaring temperatures. Effective approaches to mitigating extreme heat consider lowering the albedo, or reflectivity, of surfaces, increasing urban vegetation (trees, parks, etc.), and decreasing the presence of impervious surfaces (surfaces that inhibit the infiltration of stormwater runoff, such as concrete, parking structures, or rooftops). Some of these solutions, such as cool roofs, are easily implementable by painting building roofs white, while others trigger a new set of concerns not directly related to the heat, including gentrification and displacement. In addition to mitigating heat, a number of these interventions have indirect benefits on their communities, such as crime reduction, social cohesion, and public space access. But at what cost?

A Helping Hand: Learning from Others

Urban Vegetation

As Hunts Point residents know, air conditioning is not a feasible solution moving forward, especially when there are areas to spend money on provisions other than the expensive electricity bills. Environmentally, air conditioning produces a surge in power demand, which subsequently drives climate change and higher temperatures.

Precedent: Medellín's Green Corridor Project

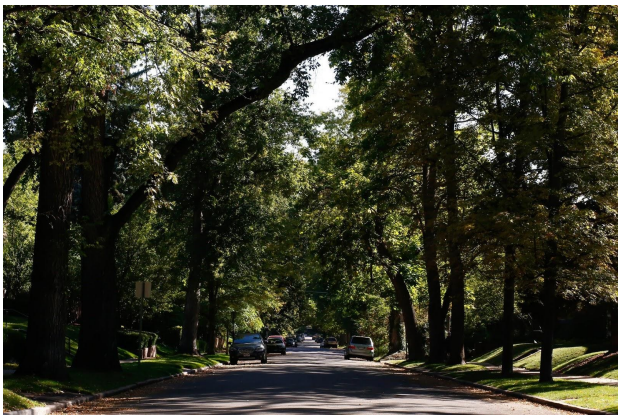
Medellín, Colombia's second-largest city, has launched nature-based solutions—actions that protect, sustainably manage, and restore natural or modified ecosystems while also addressing societal challenges. Its Green Corridor project, which won the 2019 Ashden Award for Cooling by Nature Award, has transformed 18 roads and 12 waterways into a green paradise that reduces the impact of the heat island effect. Tangentially, the communities where these interventions are introduced have seen a decrease in drug-related crime, as the parks have replaced the empty alleyways and families have begun to bring their children out to play.

Green Roofs

The EPA reports that green roofs have been proven to help reduce heat islands. A green rooftop, also known as a rooftop garden, is a vegetative layer grown on a rooftop. The temperatures of

green roofs can be 30–40°F lower than those of conventional roofs and they can reduce city-wide ambient temperatures by up to 5°F. Furthermore, green roofs can reduce building energy use by 0.7%, leading to an annual savings of $0.23 per square foot of a roof's surface. Chicago has the most green roofs in the United States with a total of 7 million square feet, with Washington, D.C., Portland, Chicago, and New York City following suit. Though the long term benefits of this practice are clear, some concerns are the initial costs of installing the green roofs, as compared to cool roofs.

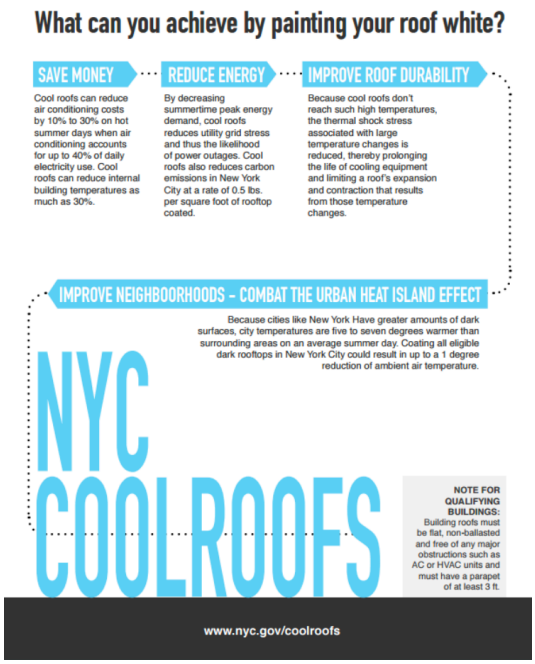
Precedent: Zürich's Green Roof Program
Since 1991, the city of Zürich has made it mandatory for all flat roofs not used as roof terraces to be 'greened' when constructing new housing developments or renovating older ones. Though the initial purpose was to promote biodiversity, subsequent benefits included reducing heat stress.



One of the most significant precedents is the Moos Lake Water Plant green roof, constructed in 1914. The soils are able to keep the water filtration processes inside the building cooler, thus preventing bacteria from developing in the municipal water supply.

Cool Roofs
Cool Roofs, which use white paint to make surfaces more reflective, are low-cost, effective strategies for significantly decreasing buildings' internal temperatures and, as a result, lowering air conditioning costs by 10% to 30%. In New York City, installing cool roofs can reduce up to 30% of internal building temperatures during the summer and increase the longevity of roof and building cooling equipment. Since these installations are provided at no-cost to nonprofits, affordable and supportive housing organizations, cooperatively-owned housing, and public, cultural, and/or community services, these areas have seen an improvement in the comfort of building residents and tenants.

Though cool roofs sound like a low-hanging fruit, some caution that cool roofs may actually be counterintuitive. A Stanford University study poses that reflected heat from cool roofs could reheat brown and black soot particles in the air and actually increase local temperatures, rather than lower them. The deflected heat and sunlight back into the atmosphere could cause a multitude of impacts on our weather system. The result would be thinner clouds and less rain.



Another study from Arizona State University led by Matei Georgescu found that in Florida, for example, reflective roofs have a much smaller cooling effect (about 0.7 degrees) since they cause a slight reduction in local rainfall. “Every city is different, and there’s still more work to do to understand the different trade-offs,” Dr. Georgescu says.

Precedent: NYC’s ºCoolRoofs

The City of New York has invested over $4 million into the NYC ºCoolRoofs program and has coated over 9.2 million square feet of rooftop space since 2009. This initiative is a collaboration between the NYC Department of Small Business Services (SBS), the NYC Mayor’s Office of Sustainability (MOS), the NYC Mayor’s Office of Recovery and Resiliency, and Sustainable South Bronx, a division of the HOPE Program. In addition to lowering temperature and carbon emissions, the CoolRoofs program empowers residents to engage with the community. The city hires 70 job-seekers per year and connects them to permanent employment opportunities upon completion of their training. Following New York City’s lead, Los Angeles is spending $40,000 per mile to paint the city's streets white. Dark-colored asphalt can absorb up to 95% of the sun's rays, raising the temperature of LA streets to as much as 150 degrees Fahrenheit. With white paint, though, the streets would be 10 to 15 degrees cooler.

Solar Power

Cities across the country are moving towards solar power. Locally in Brooklyn, Brad Lander is running for city comptroller with a platform that envisions spending $500 million over the next eight years to install 25,000 solar panels on rooftops citywide. This clean, publicly owned electricity would be owned and operated by the city, which allows it to negotiate better rates with Consolidated Edison, which currently controls the city’s transmission lines. For landlords and homeowners, this is an easy sell: the city will pay rent in exchange for rooftop space. For Hunts Point residents, this means thousands of jobs for residents and transitioning to a future where people are less reliant on these privately-owned power plants.

Precedents: The United States already has enough solar energy installed to power the equivalent of millions of homes. Major American cities are helping to drive the shift to solar energy. San Diego, for example, has a goal of making 100% of all electricity from renewable sources. Milwaukee offers low-interest loans of up to $20,000 for eligible solar panel installations. Resilient Power Puerto Rico supplies community-based energy by directly investing in actions that increase communities’ control over resources and amplifying local voices to empower local

residents to accelerate the flow of impact investments to Puerto Rico's most vulnerable communities.

Local Initiatives

The above large-scale precedents involve city-wide planning and public policy initiatives—but the small acts can also yield important change. What can we as local community members do?

The Extrema App, implemented in Athens, Paris, Mallorca, and other European cities, provides real-time condition updates during heatwaves. Additionally, it directs users to the nearest cooling center by foot or by public transportation. Another useful feature is its individualization, which provides a personalized heat stress risk based on each user's current location, as well as recommendations on reducing the risk. This app could be especially effective in the South Bronx if local residents could educate community members on how to use it.

In the South Bronx, one significant issue when facing heat waves is access to cooling centers. Though Banana Kelly residents are aware of the extreme heat in the community, there is a notable lack of information on strategies to escape the heat. The Point has designed the Be a Buddy program to prepare the community for future climate events through climate health education and community preparedness. The program is centered around local volunteers, who help the most at-risk residents, including the elderly and disabled, who experience more difficulty with mobility. By shedding light on functioning cooling centers around the South Bronx before extreme heat events occur, community members will be better equipped during these events.

Feature 2:
Green Gentrification: A Double-Edged Sword

Gentrification in the South Bronx

When the Grand Concourse was opened in 1909, it was meant to match the lively energy of the famous Champs-Élysées in Paris. In the 1960s, white flight had taken root, leading many of the South Bronx white families to flee to other parts of the borough such as Co-op City and the suburbs. Today, with crime numbers decreasing and a lower rent, many white people are flocking back to the South Bronx, specifically the famous Grand Concourse. As the New York Times describes, following the new residents are signs of gentrification, including clichés such as a yoga studio, arugula and organic spinach at the local Foodtown supermarket, a weekly farmers' market in the warmer seasons, and a new deli that sells croissants and banana-chip yogurt muffins.

The South Bronx, Hunts Point in particular, has been identified by the New York City Environmental Justice Alliance as one of the twelve most heat vulnerable communities in the city, a fact emphasized by the map to the right. One area that stands out, though, is the Grand Concourse, which has a lower heat level, less impervious surface, and more tree coverage.

The increasing gentrification of the glitzy Grand Concourse has seen an increase in tree coverage around the neighborhood. Though positive as evidenced by the lower heat average, this gentrification has also negatively impacted the neighborhood, especially the community members. Felix Rodriguez, 44, a filmmaker, says that he bought a co-op eight years ago for $80,000, which has tripled in value since then. He recalls a woman in her 70s who visited a building she had lived in decades ago. "The only thing that changed was the people," she said. "The neighborhood is pretty much the same." What, then, happens to local residents already living in these buildings?

Introduction

As the New York Times reports, "In most American cities, white residents live near parks, trees and baseball fields, while communities of color are left with concrete and the heat that comes with it." Denver, for example, has established an environmental tax that has added tens of millions of dollars to its budget, meant to go towards purchasing land for new parks, repairing derelict playgrounds, and adding recreation centers and planting trees. Its main goal? Correcting the decades of systematic urban planning that has been used to set apart communities of color.

Unwinding the decades of historical injustice, though, is not so simple. Residents of historically disadvantaged areas in north Denver are concerned that the introduction of better parks and a higher density of trees will lead to a "green gentrification," which attracts wealthier families and in turn prices the current residents out of their homes. Scott Gilmore, the city's deputy manager of parks, notes, "I want to build beautiful parks for all our residents. So am I supposed to say, 'We shouldn't improve that park in that low income area because it could gentrify'? Is that right?

Do lower socioeconomic neighborhoods or communities of color not deserve parks as nice as Wash Park?"

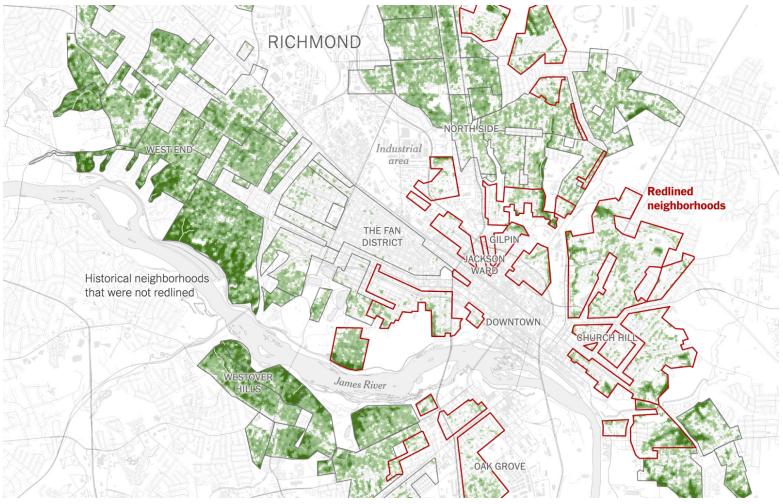
Is gentrification so bad? Returning to the South Bronx, local community member Nattia Russ notes, products of gentrification—abandoned lots replaced by libraries, grocery stores, and schools—can also bring people to the community. More people, then, also means more jobs and more money. Nattia's deep care for her community is clear: "As long as it helps the people in the community, it is good." A study by the Philadelphia Federal Reserve Bank found that gentrification actually creates opportunity and promotes integration. The Philadelphia Fed notes that demographic changes in gentrified neighborhoods are generally associated with better outcomes for low income children growing up in these neighborhoods. Additionally, less educated renters that remained in a gentrifying neighborhood did not see significant increases in rents, while homeowners are able to benefit from increasing prices if they sell their homes, as values increased from about $167,000 to $367,000 and continue to trend up.

Cheesman Park, southeast of the downtown area, one of the city's oldest neighborhoods vs. Homes in Swansea, a predominantly Latino and working-class neighborhood in North Denver. (NYT)

What is Green Gentrification?

Climate change disproportionately affects poorer communities, women, people with disabilities, indigenous groups and other marginalized populations the most. As the World Resource Initiative notes, after Hurricane Katrina hit New Orleans, for example, nearly two-thirds of the jobs that were lost were by women, and nearly 80 percent of the population of flooded neighborhoods were people of color. While cities are beginning to tackle these issues, there is a thin line between implementing the development of green spaces for the benefit of the current residents, and "greening" areas that results in the exclusion and displacement of politically disenfranchised residents. The important pieces to the puzzle, though, are Banana Kelly residents, who have long experienced these prejudices and are essential to designing actions to combat climate change.

Efforts to expand green space in cities like Denver have faced resistance in low-income neighborhoods, as residents worry that they will be left with the costs of maintaining the trees, or see other problems as more urgent. Since the Federal Housing Administration was established in 1934, people of color, especially African Americans, have continued to be denied access to federally backed mortgages and other credit, known as redlining, by rating black and immigrant neighborhoods as "hazardous." A recent study in Richmond, VA revealed that these redlined neighborhoods are today 5 degrees hotter in summer on average than neighborhoods with higher grades, since they have less urban canopy. Similarly, the Grand Concourse is cooler than the areas around it since it has more tree coverage, which was a byproduct of gentrification



Richmond, VA: Correlation between redlined neighborhoods and tree coverage. (NYT)

Crowded Buildings, Rising Sea Levels: A Case Study of Florida

Cities like Boston and Chicago are hardening their waterfronts in the face of climate change and consequent rising sea-levels. However, these adaptations are also amenities. Community members in disadvantaged neighborhoods have seen the effects of these improvements: with the new infrastructure to fight tides, these areas are suddenly not so poor. The longtime residents are pushed out due to rising housing prices.

Compare: Swelling of Lake Michigan from 2013 to 2020. (NYT)

A survey from Redfin, a real estate brokerage, found that Americans are beginning to factor climate change into their moving plans. This form of green gentrification, which results from wealthier families moving to greener areas, pushes low-income families into at-risk areas. Soon, these community members will only be able to afford property in areas plagued by dangerous climate risks. This can be seen along the coast of Florida, where sea-level rise is an imminent threat. The number of home sales in the region has steadily dropped since 2013, inverting the once-high waterfront property prices. Lower-income, inland neighborhoods in Miami are victims to gentrification as wealthier residents escape rising waters.

Green gentrification works two ways—helping struggling residents by increasing urban vegetation, and subsequently pricing the same residents out from the appeal of the resulting improvements. How can this balance be maintained?

Feature 3:
Public Pools and Public Health

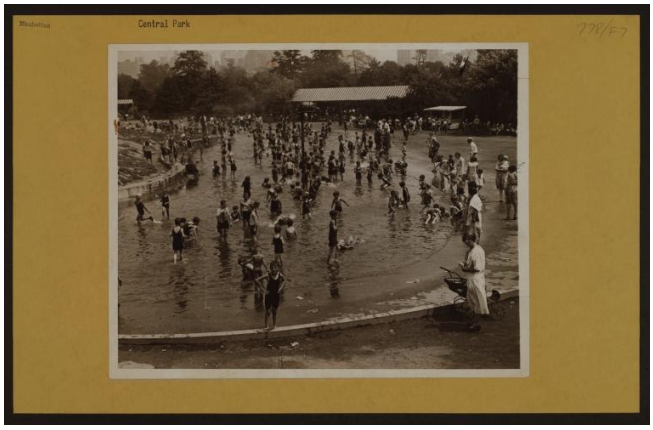
It's summer, which means long, lazy days in the pool to escape the heat. You make the short stroll to the closest public pool, where you'll be greeted by cold water and friendly faces, sneak in a nap on one of the lounge chairs, and try your hand at some of the poolside activities. Besides, what's summer if you're not spending it by the pool?

On June 26th, New York City reopened forty-eight of its outdoor pools in all five of its boroughs. Last summer, Mayor Bill de Blasio announced that outdoor public pools would stay closed for the summer in an effort to save money in the budget, but reversed the decision in June, reinstating just 15 of the 53 outdoor pools. This summer, the city also debuted three recently renovated pools as part of its Cool Pools initiative, which included wall art, lounge chairs, and free poolside activities. In the Bronx specifically, the Van Cortlandt Pool now has a life-size Connect Four, in addition to a new mural and colorful chairs. Though pools are a trademark of summer fun, there are more important public health implications: their cooling features are essential for beating heat, especially in areas like the South Bronx, one of the hottest areas in New York City. How can we manage the city's water supply to meet future demands as the weather continues to heat up?

Where is the Water Coming From? The History of Public Pools
New York City is known for having one of the cleanest and most reliable municipal water sources in the US. The water comes from the Croton, Catskills, and Delaware watersheds, which have a combined capacity of 550 billion gallons. Distributed today across the city via a 6,800-mile network of pipes, water flows to around 109,526 hydrants, 1,103 public bathrooms, 841 spray showers, 3,120 drinking fountains, and 65 active public pool complexes in New York City.

Water, though, was not always so easily and universally accessible. With the construction and expansion of the water supply system, private bathrooms became commonplace for middle and upper-class New Yorkers. Access to fresh water for the majority of working-class people, though, was still limited. Finally, in 1895, the New York State legislature passed a law mandating public baths for all cities with more than 50,000 people in the state.

Subsequently, New York City opened its first municipal bath in 1901 at 326 Rivington Street. This bathhouse became so popular that, during a fatal heat wave a few years later, a small riot broke out in the line there. The site, later renamed the Baruch baths, is no longer in use, though the building still remains. There are other examples of pools that do remain today, such as the pools at the Asser Levy, East 54th Street, Tony Dapolito and Gertrude Ederle recreation centers, which all began as bathhouses. Inspired by European examples, these baths provided public showers, tubs, laundries, and restrooms.



Wading pool in Central Park, year unknown. (NYPL)

Public baths have evolved into public swimming pools, losing their public health purposes and connecting the city's water supply to public spaces for recreation and social interaction. Today, public pools are not only important to keeping people cool during the summer months, but also for bringing communities together. Average attendance on any given weekend day reaches 30,000 people, with the biggest pools each accommodating more than 2,000 swimmers per day. These pools, though, do not have the capacity to match the population as a whole. Given the population of New York City, roughly one pool complex would serve 160,000 New Yorkers, making pools a scarce cooling source. During the pandemic, this issue was further emphasized when public pools were closed, forcing communities to seek out new solutions for "pop-up" cooling centers.

Public Pools and Public Health

Public pools, water splashes, drinking fountains, public bathrooms, and hydrants, for example, are critical infrastructures for health, hygiene, and public space. Public pools can be seen as cooling centers, providing free spaces for families to go to cool down, while also keeping children entertained. These pools are so popular, in fact, that some counties have reported that outdoor cooling sites, including public pools, are used more often than indoor cooling centers.

Astoria Pool in 1936. (WSJ)

Outdoor pools effectively battle heat by circulating water at body temperature or even below. Primary care physician Aditi Chincholi at Mercy Health Associates in Philadelphia notes, “One of the ways the body thermoregulates is through conduction, which is transferring heat from the body to a cooler surface that it’s in contact with. Swimming would transfer excess body heat to the water in the pool, which will help regulate body temperature and keep it within normal body limits.”

Free Swimming Programs

For families with energetic children, public pools are also a perfect way to keep kids and parents active and out of the house. New York City offers free swimming programs for kids, adults, and seniors, such as:

- Learn to Swim
- Swim Teams
- Adult Lap Swims
- Senior Water Aerobics
- Adaptive Swim Program for people with disabilities.

Representation of Public Pools in Media

Pools are commonly romanticized in media, from advertisements for “New York City’s most lavish 360º view rooftop pool”, to the recent film *In the Heights*. These luxurious rooftop pools, however, are usually expensive or located in high-end hotels. The advertisements not only emphasize the exclusivity of the pools, but also set unnecessary standards for outdoor pools that differ significantly from public pools.

In the Heights pool scene (Warner Bros) and Wellness Pool in Governors Island (QC NY).

In the Heights, on the other hand, celebrates the beauty of public pools. During a record-breaking heat wave, the local Highbridge pool acts as a central space for the community to cool down and come together. From b-boys and b-girls to salon ladies to businessmen, all are welcome in the pool.

The purpose of public pools is threefold: a place to cool down, relax in the summer, and connect with the community.

Feature 4:
Where Did all the Cooling Centers Go?

As each summer seems to be impossibly hotter than the last, extreme heat has arrived at the forefront as a pressing issue. Last month, Mayor Bill de Blasio called for New Yorkers to cut down on electric use in the midst of four successive days of intense heat and scattered blackouts across the city. As Banana Kelly residents are aware, heat affects human health in a number of ways, including heat cramps, heat exhaustion, heat stroke, and even death. In fact, extreme heat is the deadliest severe-weather event. Now more than ever, residents need to know how to cool during the summer.

What Are Cooling Centers?
Cooling centers are commonly used across the country in response to summer heat, and are especially appealing tools to public health officials because they are easily implementable and only temporarily open during heat waves. Cooling centers are often located in government-owned buildings or spaces, such as a:

- library
- school
- community center
- religious center
- recreation center
- spray park
- community pool
- public park

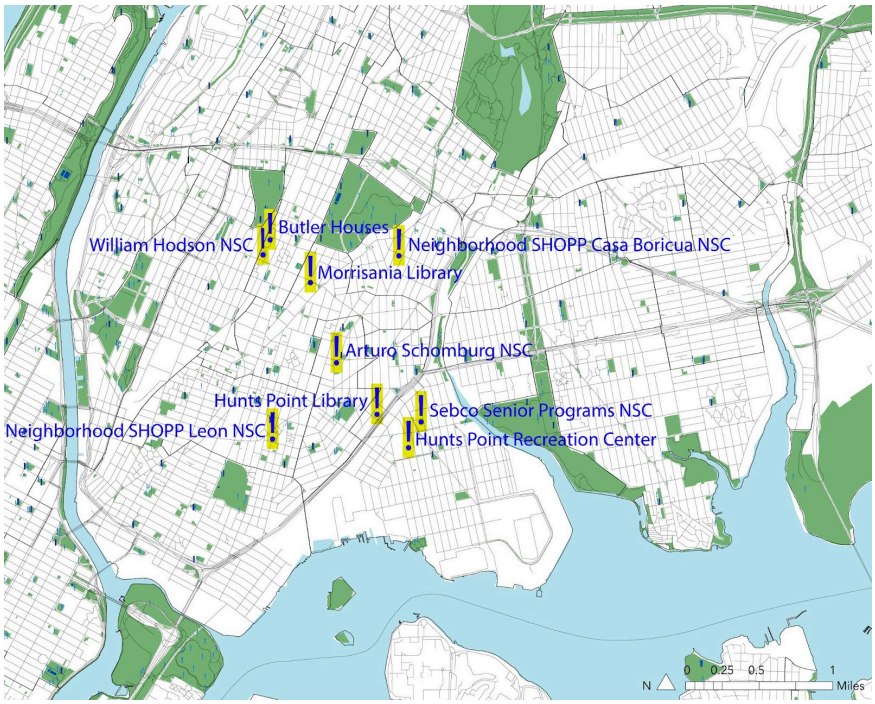
Private businesses can also be used as unofficial cooling centers in the form of a coffee shop, grocery store, shopping mall, or movie theatre. Consistency is a clear issue with official cooling centers in New York City. The centers are only open during heat waves, which are not declared until temperatures have reached 90 degrees or above for three consecutive days. And information about the locations of cooling centers is not available unless a heat wave is already declared, which makes it difficult for residents, especially the elderly or disabled, to get to cooling centers during extreme heat.

Eileen Hannah, President of the Tenants Association at 865 East 167th Street, explains how she used to go to a local White Castle instead, which is less than ten minutes away from her building. The closest cooling center at Morrisania Library, though, is twelve minutes away. She recalls bringing her cat to the White Castle and meeting other neighbors there, as the location allowed people to sit inside and enjoy the air conditioning during the summer. Now that the White Castle is under new management, though, Eileen says that she chooses to stay in her own apartment, where she pays for air conditioning that is not even provided in the lobby of her building. How do local institutions, such as White Castle and other fast food restaurants, that provide air conditioning in exchange for unhealthy food influence residents' relationships with cooling centers?

Cooling Centers in the Area
In the wake of blackouts, energy savings periods enacted by Con Edison, and the overall increase in the number of scorching hot days, it is important for residents to be aware of places to go to cool down — before these events occur. In New York City, there are over 160 cooling centers throughout the city. The nearest cooling center can be located by calling 311 or by visit the City's Cooling Center Finder online.

However, this website is only active during a heat wave, making it critical for residents to know where the closest cooling center is in advance. The map below shows the cooling centers in the South Bronx area. A few local cooling centers include:

- Morrisania Library
- Hunts Point Library
- Hunts Point Recreation Center
- Neighborhood SHOPP Casa Boricua NSC
- Sebco Senior Programs NSC
- Arturo Schomburg NSC
- William Hodson NSC
- Neighborhood SHOPP Leon NSC
- Butler Houses



Map of Cooling Centers in the South Bronx (made by me on Adobe Illustrator).

How Can I Get to a Cooling Center?

Access to cooling centers is notably difficult for the elderly and disabled, as they require planning in advance to make sure it is possible to get to cooling centers safely. The Be a Buddy Program through The Point, for example, has local volunteers who help the most at-risk residents and educate the community about climate preparedness. People who suffer from chronic medical conditions or are on critical life-saving equipment, are elderly and living alone, have a disability or other limitation, or live in households lacking adequate cooling and/or heating equipment are eligible to participate in this program. This

program is especially effective for those at risk, providing support for those who may be afraid to ask for help, or are isolated and unable to.

Looking to other cities, there are several modes of transportation that can be used to reach the nearest cooling center. In Philadelphia during July 2019, Lyft provided two free rides up to $15 each to cooling centers. This would be helpful in the South Bronx, especially if people are taught how to use the app. There are a number of cooling centers scattered around the South Bronx, with the closest to Banana Kelly only 12 minutes away at either Hunts Point Library or Sebco Senior Programs NSC—still, though, walking is daunting in almost 100-degree heat.

A study in the Journal of Transport and Health on cooling centers in the state of New York found that, in metropolitan areas, public transportation improved accessibility of cooling centers. Furthermore, free and accessible transportation can improve cooling center utilization. The study recommended this information to be used for local health officials in program planning during extreme heat events. The Community Arranged Resident Transportation Program (C.A.R.T.) Project, for example, provides free specialized transportation for the frail elderly, and is funded by the New York City Department for the Aging. It operates in Manhattan with five vans, from the Battery to 96th Street on the East Side and to 110th Street on the West Side, and takes seniors to and from medical appointments and hospitals, planned activities at senior centers, and other entitlements.

Subways are known to be hot, dirty, and outdated. Buses, on the other hand, are slightly better, as they offer more seating and are generally cleaner, since they are more frequently updated. The temperature in buses is regulated to accommodate "average ridership", which is around half capacity. This means they will inevitably feel hotter during the summer, and colder during the winter despite air conditioning and heating. Compared to subways, buses are generally cooler and more reliable, making them more appealing to riders. By bus, residents can take the Bx6 three stops from E 163 St/Prospect Ave to E 163 St/Fox St, walking only five minutes to the Hunts Point Library and Sebco Senior Programs NSC, which are located right next to each other.

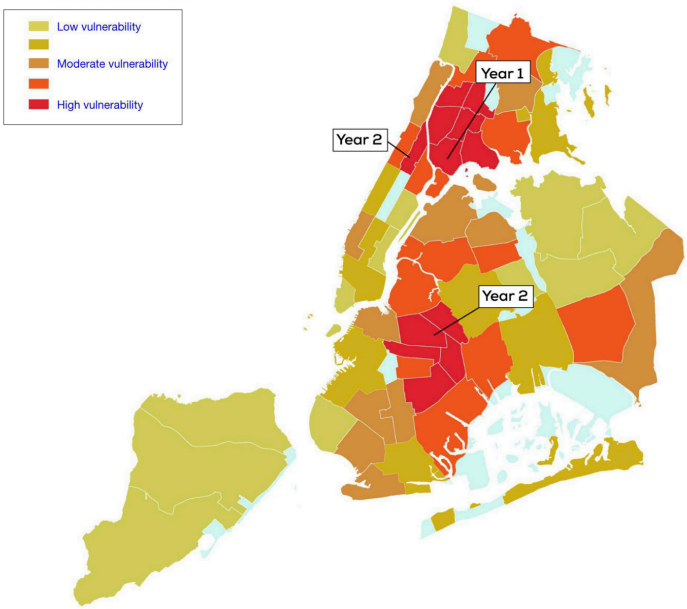
Conclusion

Cooling centers are essential to survive through unbearable heat in the summer. However, without sufficient information on where cooling centers are and how to get to them, they lose much of their purpose. By providing information for residents, many more community members will be better prepared for the next heat wave. Which cooling center will you be going to next?

Feature 5:
The Hunts Point Be a Buddy (BaB) Program

Heat waves and other extreme-weather events are unpredictable, which makes them even more of a challenge to communities. In a press release, Mayor Bill de Blasio said, "This is a question of equity; hotter summers, exacerbated by climate change, are a threat that falls disproportionately on communities of color and the elderly. We are answering that question with programs designed to protect the health of New Yorkers, expand our city's tree canopy, promote community cohesion, and more." We should not be identifying at-risk neighbors in the midst of an extreme heat event. Rather, it is important to build social networks within communities that can help share life-saving information *prior* to an emergency, and then reach out to at-risk neighbors during an extreme heat event.

Heat and Cooling Centers
South Bronx neighborhoods, including Highbridge-Morrisania, Crotonia-Tremont, Hunts Point, and Mott Haven, have some of the highest rates of heat illness and death in New York City. For residents, heat can significantly affect public health through an increased risk of cardiovascular and respiratory illness, increased mental-health related illness such as stress, anxiety and depression, and worsened existing chronic medical conditions.



Heat vulnerability in New York City (Cool Neighborhoods NYC).

Cooling centers are important because they provide relief for communities through the use of air conditioned-buildings, which can lower the risk of developing a heat-related illness. The issue, though, is that many elderly and disabled people, who are important to the community of the South Bronx, may have difficulty getting to their closest cooling center. During a heat wave, it is especially difficult to walk the streets or take public transportation, and without proper

preparation, these at-risk residents are left alone in their homes, which often have no air conditioning. This is where the Be a Buddy Program comes in.

What is the Be a Buddy Program?

The Be a Buddy Program is an initiative led by The Point, in partnership with the Mayor's Office of Recovery and Resiliency "Cool Neighborhoods NYC" program, the NYC Department of Health and Mental Hygiene (DOHMH), and the Fund for Public Health NY (FDPNY). Created in 2017 with a $930,000 investment from New York City, the program is designed to curb the effects of extreme heat. The goal of BaB is to prepare the local community for future climate events, especially heat, through climate health education and community preparedness.

A resident door knocking at the Queensbridge Houses (Cool Neighborhoods NYC).

The goals of Be a Buddy are twofold: training community organizations and volunteers on emergency protective measures and ways to assist vulnerable adults, and engaging communities to identify neighborhood resources for staying cool and to communicate protective health messages to hard-to-reach populations with the help of trusted messengers. The program educates residents with the help of local volunteers, who support the most at-risk residents and informs the community on climate preparedness. In case of a climate-related emergency, the residents who are registered in the BaB will be contacted and assisted by local volunteers—familiar faces from the community. By increasing volunteerism, Be a Buddy hopes to nurture buddy systems between social service and community organizations, volunteers, and vulnerable South Bronx residents. These buddies are prepared for emergencies, when they conduct telephone, door-to-door, and building level checks on these vulnerable individuals. BaB has the ability to save the lives of at-risk neighbors by pairing them with buddies as well as preparing them for extreme heat events.

How Can I Enroll in this Program?

People who are eligible to participate in this program include:

- Anyone who suffers from chronic medical conditions or is on critical life-saving equipment
- Anyone who is considered elderly and living alone
- Anyone who has a disability or other limitation
- Households lacking adequate cooling and/or heating equipment, i.e. air conditioners/ radiators

How Can I Be a Buddy?

If you are interested in becoming a buddy, that is great! For more information on applying, or if you have any questions, you can contact the Be a Buddy Community Resiliency Organizer, Aryanna Osorio at (718) 542-4139 or email BeABuddyHP@gmail.com. The application is also available on the Point website.

Buddies commit to 20 hours a month, which varies depending on what the program is working on and your availability. You will also receive a stipend for $15/hr.

Some responsibilities include:

- 8-10 hours/month - Making calls, checking on participants, outreach to sign up new participants, and taking notes of conversations/observations
- 5 hrs/month - Training/Skill Building (ex: Overdose Prevention, Outreach etc.)
- 2-4 hrs/month - Planning & Debriefing meetings at The Point
- 1-5 hrs/month - Support with pantry, surveys or other community activities

Public Health Information and Community Resilience

A study by the World Bank found that, after the 2011 Great Eastern Japan Earthquake, older people were eager to do something to help their city of Ofunato, Japan recover. Elders and community members planned and built the Ibasho Café, which now acts as a hub that is restoring the community still badly damaged by the disaster. Social cohesion, enhanced by elderly residents and other community members, better prepares communities to withstand natural disasters and their subsequent health impacts.

A Cool Neighborhoods NYC Report found that older adults do not perceive themselves to be at risk to extreme heat. Furthermore, adults noted they did not believe air conditioning was a useful

preventative measure, which Cool Neighborhoods NYC adds is due to media portrayal. News broadcasts tend to focus on children in outdoor locations during extreme heat events instead of the older adults in potentially dangerous indoor environments; these news outlets are at a powerful position for sharing information and promoting wellness, and should be using these platforms to their advantage. Communities cannot be resilient without the necessary information to stay safe, which makes the Be a Buddy program even more important. With the help of local residents, the Banana Kelly community can be better informed for the next extreme weather event, which is sure to threaten the well-being of many at-risk members.

Other Community Outreach Programs

The City of New York has also implemented other community-led programs to help mitigate the effects of heat in the South Bronx. The NYC Cool Roofs Program engages with local individuals to train and empower them to work with a team to coat the city rooftops with a white reflective coating, which reduces the temperature within buildings by up to 30%. As of 2017, the program has coated 6 million square feet of rooftop, and employed almost 6,000 local volunteers. New York City also adopted the Million Trees initiative to plant 1 million trees by 2017. This initiative works to reduce the urban heat island effect, which causes cities to be hotter than the suburbs, while also reducing greenhouse gas emissions.

The Be a Buddy program is a wonderful way to engage members of the Banana Kelly community, whether as a volunteer or as an at-risk neighbor. The program is crucial for informing residents on the effects of heat and strategies for preparing before the next extreme weather event. With the help of the Be a Buddy program, residents will be more resilient when the next heat wave inevitably hits.

Feature 6:
Interboro's *Refreshing Waters* Cooling Station

Nestled in Father Gigante Plaza, next to the NYPL's Hunts Point branch, is *Refreshing Waters*, a pop-up cooling station designed by Interboro Partners. Immediately standing out with the iconic Tiffany blue concrete seating that lines the fence, and covered by a canopy of trees with a pleasant mist that surrounds patrons, the cooling center provides a welcome respite from the heat. Community members can be seen sitting along the fence or on the movable blue chairs, deep in conversation.

Refreshing Waters was born from a partnership between Interboro and the NYC Department of Health and Mental Hygiene (DOHMH) in an effort to promote active design and healthy behaviors in the South Bronx. Since the NYPL and other indoor buildings were closed during the pandemic, the cooling center was especially useful for providing a space for people to escape their apartments during the blazing heat. Cooling centers are essential to public health during the summer, when many residents need to cool down and have no air conditioning.

First and foremost, *Refreshing Waters* builds on the infrastructure that is already there, says Georgeen Theodore, co-founder of Interboro and lead designer of the project. It is an intersection of the built environment, public health, and environmental conditions. The details are in the little things, from the concrete seating to the movable chairs to the blue fans that spray a welcome mist onto sitters.

One of the most important parts of designing the cooling center was the role of the community. Interboro noticed that the roof of the St. Athanasius Church and the Bruckner Expressway were painted blue. Accenting the cooling center in a Tiffany blue color celebrates and signifies the space as belonging to the community. *Refreshing Waters* is constantly building on feedback from the community. How does it affect social life? Do the movable chairs enhance interaction, encouraging residents to stay there longer and meet new people? Georgeen notes that, just last week, there was a "Bookmobile" for locals from the NYPL. The space is intergenerational -- with seniors mingling outside and children playing sports led by UNITAS, a nearby healthcare clinic.

Refreshing Waters is not just a one-off event. Though it began as a pilot cooling center last year, it has returned for another year this summer. Experimental cooling centers have appeared in other areas as well, such as the Urban Cool Umbrella, a type of scaffolding that has appeared in parts of New York City, and the Oasys system, a network of gridded stations and hubs in Abu Dhabi. Additionally, Interboro is building another cooling center at The Point, which is easily distinguishable by the bold yellow fencing. It improves on *Refreshing Waters*, with longer-range misters that provide even more cooling. These new cooling centers, built by and for the people of the South Bronx, nurture social resilience, providing people with a place to gather while also cooling down.

Next time you're looking for a place to escape the heat, be sure to check out *Refreshing Waters*!

Resident Interviews With Community Leaders of the South Bronx

In addition to the six feature articles, we also conducted interviews with Banana Kelly residents. These were an important part to the newsletters, as it provides familiar faces in the newsletter. It inspires people to read the newsletter since they see themselves in it, and enhances the community of Banana Kelly and Hunts Point.

For resident profiles, I had the opportunity to talk with two residents. The first was Nattia, who had great things to talk about community and block parties that bring people together, and is really passionate about homelessness and crime in the area. I also chatted with Janet, who is really excited about food and eating healthy in the South Bronx as well as mental health, since she is a therapist for schizophrenic patients.

Additionally, we were fortunate enough to be invited to the Banana Kelly Resident Council, which included leaders of the community, such as presidents of building tenants associations, Banana Kelly employees, and . These conversations were very valuable as they provided insight into

Nattia Russ
Age: 41
Pronouns: she/her
Time in the Bronx: All her life

“Get involved — even if you are not comfortable.”

“It takes a whole village to raise a child,” Nattia Russ says. She’s lived in the South Bronx her whole life, surrounded by family who also live in the area. Growing up in the Bronx, she wishes that her children could experience the same summers she did—closed off streets, block parties, and having fun with other children only a block away from her. Now, with summer camps becoming more expensive, she goes out biking with them to make sure they’re staying active. There are plenty of parks around her building, most of them connected to the schools, so she’s able to get out when she has a chance.

Nattia’s favorite part about the South Bronx is the community. There are lots of things to do, with nearby parks, beaches, and community centers to stay active physically and within the community. She can easily go to the store around the corner, and there are many food stands and bodegas along Prospect Street.

One recurring issue Nattia’s seen is poverty, homelessness, and crime. She says that people don’t want to go to shelters because of the treatment they receive there, but she is only one person and feels like she alone can’t make an impact, which is why she joined her building’s tenants association. As part of the tenants association, Nattia feels more connected to her neighbors, and is able to help them with any issues with the landlord or the building. Not only has she helped her neighbors, but she has also helped with food drives in the building during COVID-19. Looking forward, Nattia hopes to revive the community around the neighborhood by hosting a block party, so stay tuned!

Janet Brian

“In life, people come for a reason, a season, or a lifetime.”

Janet Brian loves to cook. She prefers to drive out to Costco to get her groceries in bulk instead of buying food from the local bodega. She loves greens, such as asparagus, spinach, and lettuce, which she makes sure to pick up when she makes her trips to Costco. However, Janet is worried for her neighbors—many of them don’t eat healthy food, especially with the presence of bodegas and local fast-food places that sell poor-quality and unhealthy foods, which directly affects their own well-being.

Janet works as a therapist for mental health patients. She cares deeply about her patients, especially since they usually are left in hospitals all alone. What they need most is a person to talk to, and Janet is always there to be that person. She understands people well, and wants to make sure people can fight for themselves. She cares deeply about her community and her neighbors as well. Once, for a neighborhood party, she cooked some of her favorite healthy meals, but found that people weren’t really interested in it. After all the time she spent on cooking, it was disappointing to see that people still didn’t want to eat healthy, so she believes the best thing is to begin with educating young people about how to start including healthy food in their meals, so that they can learn to eat healthier from a younger age.

The issue with food in the South Bronx isn’t that there isn’t enough food. The issue is that bodegas are meant for emergency shopping, since they provide corn, bananas, meats, turkey, fish, etc., but the quality of the food is all bad. As Janet mentions, a local Chinese fast-food restaurant hypocritically sells incredibly unhealthy food for people to eat, yet the restaurant owners don’t even eat the food themselves. A lot of people would like to have healthy food, she says, but they don’t know where to start. As Janet continues to cook her greens, she hopes her neighbors will too.

Best Practices Tool Box

Towards the end of the summer, we each created a Best Practices Tool Box, which highlights different heat mitigation strategies that have been employed around the world. I believe that we can learn a lot from others, and this best practices tool box focuses on creative and exciting ways to approach the universal problem of heat, especially in urban spaces.

These projects focused on increasing the urban vegetation in the area, painting roofs white, and helping residents be more aware of the climate and area they are living in. I think that community is an essential part to staying cool during these heat waves, and if people are more prepared for the next incident, they can also be more resilient. One interesting part of this research was that, often, these interventions can have positive side-effects. For example, the Medellín Green Corridor Project also saw a decrease in crime, since these areas that were previously used for criminal activity were now occupied by families in the parks. It is interesting to see how one intervention can produce many positive results.

Case Study Title: Urban Vegetation: Medellín's Green Corridor Project	
Description:	Medellín, Colombia's second-largest city, has launched nature-based solutions—actions that protect, sustainably manage, and restore natural or modified ecosystems while also addressing societal challenges. Its Green Corridor project, which won the 2019 Ashden Award for Cooling by Nature Award, has transformed 18 roads and 12 waterways into a green paradise that reduces the impact of the heat island effect.
What Other Lens Does the Project Touch On?	Air, Sound
Where Was It Used?	Medellín, Colombia
Who Used It?	Medellín, Colombia
What Did It Cost?	$16.3 million initial investment, maintenance costs $1.50 per square meter every two to three months based on work done by 150 gardeners
What Was Learnt?	Tangentially, the communities where these interventions are introduced have also seen a decrease in drug-related crime, as the parks have replaced the empty alleyways and families have begun to bring their children out to play.
What Are The Pitfalls?	There is a very large investment cost that may pose a barrier to entry, though the long-lasting effects may outweigh these negatives. Additionally, the issue of green gentrification may arise.
Links	https://www.unep.org/news-and-stories/story/medellin-shows-how-nature-based-solutions-can-keep-people-and-planet-cool, https://www.reuters.com/article/colombia-heatwave-environment-nature-idAFL8N2OY69Q, https://www.c40knowledgehub.org/s/article/Cities100-Medellin-s-interconnected-green-corridors?language=en_US
Images	  

Case Study Title: Green Roofs: Zürich's Green Roof Program	
Description:	Since 1991, the city of Zürich has made it mandatory for all flat roofs not used as roof terraces to be 'greened' when constructing new housing developments or renovating older ones. Though the initial purpose was to promote biodiversity, subsequent benefits included reducing heat stress. One of the most significant precedents is the Moos Lake Water Plant green roof, constructed in 1914. The soils are able to keep the water filtration processes inside the building cooler, thus preventing bacteria from developing in the municipal water supply.
What Other Lens Does the Project Touch On?	Food, Air
Where Was It Used?	Zürich, Switzerland
Who Used It?	Zürich, now Europe and US too
What Did It Cost?	The cost for a green roof ranges from $10.30 to $12.50 per square foot more compared to a conventional, black roof.
What Was Learnt?	Green roofs have been proven to help reduce heat islands. The temperatures of green roofs can be 30–40°F lower than those of conventional roofs and they can reduce city-wide ambient temperatures by up to 5°F. Furthermore, green roofs can reduce building energy use by 0.7%, leading to an annual savings of $0.23 per square foot of a roof's surface. Chicago has the most green roofs in the United States with a total of 7 million square feet, with Washington, D.C., Portland, Chicago, and New York City following suit.
What Are The Pitfalls?	Though the long term benefits of this practice are clear, some concerns are the initial costs of installing the green roofs, as compared to cool roofs.
Links	https://www.urbangreenbluegrids.com/projects/zurich-switzerland/, https://www.gsa.gov/cdnstatic/Cost_Benefit_Analysis.pdf
Images	 

Case Study Title: Cool Roofs: NYC's ºCoolRoofs	
Description:	The City of New York has invested over $4 million dollars into the NYC ºCoolRoofs program and has coated over 9.2 million square feet of rooftop space since 2009. This initiative is a collaboration between the NYC Department of Small Business Services (SBS), the NYC Mayor's Office of Sustainability (MOS), the NYC Mayor's Office of Recovery and Resiliency, and Sustainable South Bronx, a division of the HOPE Program. In addition to lowering temperature and carbon emissions, the CoolRoofs program empowers residents to engage with the community. The city hires 70 job-seekers per year and connects them to permanent employment opportunities upon completion of their training. Following New York City's lead, Los Angeles is spending $40,000 per mile to paint the city's streets white. Dark-colored asphalt can absorb up to 95% of the sun's rays, raising the temperature of LA streets to as much as 150 degrees Fahrenheit. With white paint, though, the streets would be 10 to 15 degrees cooler.
What Other Lens Does the Project Touch On?	Air
Where Was It Used?	New York City
Who Used It?	Collaboration between the City of New York, NYC Department of Small Business Services (SBS), the NYC Mayor's Office of Sustainability (MOS), the NYC Mayor's Office of Recovery and Resiliency, and Sustainable South Bronx
What Did It Cost?	$4 million initial investment, free to install for nonprofits, affordable and supportive housing organizations, cooperatively-owned housing, and public, cultural, and/or community services
What Was Learnt?	Cool Roofs, which use white paint to make surfaces more reflective, are low-cost, effective strategies for significantly decreasing buildings' internal temperatures and, as a result, lowering air conditioning costs by 10% to 30%. In New York City, installing cool roofs can reduce up to 30% of internal building temperatures during the summer and increase the longevity of roof and building cooling equipment. Since these installations are provided at no-cost to nonprofits, affordable and supportive housing organizations, cooperatively-owned housing, and public, cultural, and/or community services, these areas have seen an improvement in the comfort of building residents and tenants.

What Are The Pitfalls?	People — including businesses — may not know about the cool roofs program.
Links	https://www1.nyc.gov/assets/orr/pdf/Cool_Neighborhoods_NYC_Report.pdf, https://www.businessinsider.com/new-york-city-painted-6-million-square-feet-of-rooftop-white-2018-8
Images	  

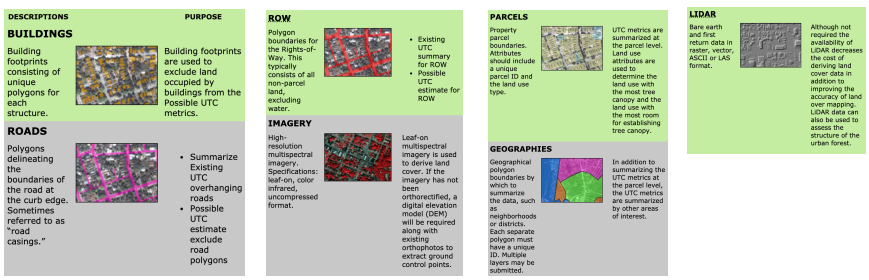
Case Study Title: Solar Power: Resilient Power Puerto Rico	
Description:	Resilient Power Puerto Rico supplies community-based energy by directly investing in actions that increase communities' control over resources and amplifying local voices to empower local residents to accelerate the flow of impact investments to Puerto Rico's most vulnerable communities.
What Other Lens Does the Project Touch On?	Air
Where Was It Used?	Puerto Rico
Who Used It?	Puerto Rico
What Did It Cost?	$2.5 million initiative
What Was Learnt?	Continuous access to distributed renewable energy is a critical stepping-stone to a community's ability to engage in recovery and build a sustainable and equitable future.
What Are The Pitfalls?	Storage for renewable energy is still limited, but Resilient Power Puerto Rico is working to create storm resilient microgrids that utilize solar energy and battery storage systems, like the Tesla Powerwall.
Links	https://resilientpowerpr.org/, https://www.solarpowerworldonline.com/2018/03/resilient-power-puerto-rico-launches-2-5-million-solar-campaign/
Images	  

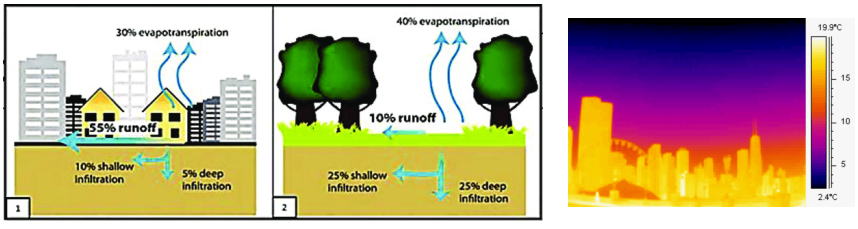
Case Study Title: Extrema App	
Description:	The Extrema App, implemented in Athens, Paris, Mallorca, and other European cities, provides real-time condition updates during heatwaves. Additionally, it directs users to the nearest cooling center by foot or by public transportation. Another useful feature is its individualization, which provides a personalized heat stress risk based on each user's current location, as well as recommendations on reducing the risk.
What Other Lens Does the Project Touch On?	Air
Where Was It Used?	Athens, Paris, Mallorca, and other European cities
Who Used It?	For the purpose of citizens
What Did It Cost?	EXTREMA project is funded 75% by the Directorate−General for European Civil Protection and Humanitarian Aid of the European Commission (EC). 25% is funded by own contribution of the partners.
What Was Learnt?	To maintain an acceptable quality of life for the future, cities must increase the population's resilience to extreme temperatures and self-protection by establishing disaster risk reduction actions and by building the capacity of the population to anticipate and respond to disasters. This phone application is especially effective because it leverages the high penetration rate of smartphones and is able to use this information to produce accurate information for citizens. This app could be especially effective in the South Bronx if local residents could educate community members on how to use it.
What Are The Pitfalls?	People may not know how to use smartphones / apps.
Links	https://extrema.space/, https://www.c40.org/case_studies/extrema-emergency-notification-system-for-extreme-temperatures
Images	 

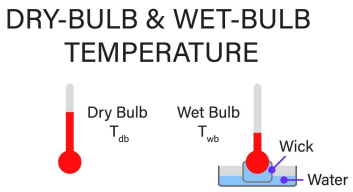
Case Study Title: Be a Buddy Program	
Description:	The Point has designed the Be a Buddy program to prepare the community for future climate events through climate health education and community preparedness. The program is centered around local volunteers, who help the most at-risk residents, including the elderly and disabled, who experience more difficulty with mobility. By shedding light on functioning cooling centers around the South Bronx before extreme heat events occur, community members will be better equipped during these events.
What Other Lens Does the Project Touch On?	Air, Noise, Food
Where Was It Used?	New York City
Who Used It?	The Point
What Did It Cost?	Free! Volunteers are unpaid.
What Was Learnt?	In the South Bronx, one significant issue when facing heat waves is access to cooling centers, as there is a notable lack of information on strategies to escape the heat. One of the most valuable resources, though, is community members themselves. With their help, isolated community members, such as the elderly and disabled, feel like they have someone they can turn to during these heat waves.
What Are The Pitfalls?	People may be apprehensive about asking for help, or not know what resources are out there.
Links	https://thepoint.org/be-a-buddy-program/
Images	 

Evaluation Tool Box

We also created a Best Practices Tool Box, which includes three different, less-obvious ways of measuring heat. I chose to focus on Urban Tree Canopy, which measures the amount of tree coverage, which directly affects the temperature of the area, Impervious Surface, or the amount of concrete which also contributes to temperature, and Wet Bulb Temperature, which allows someone to see their capacity to cool down given a certain area. These different ways of measuring heat are important because they provide different perspectives on how our environment contributes to heat, and the actions we can do to fight it.

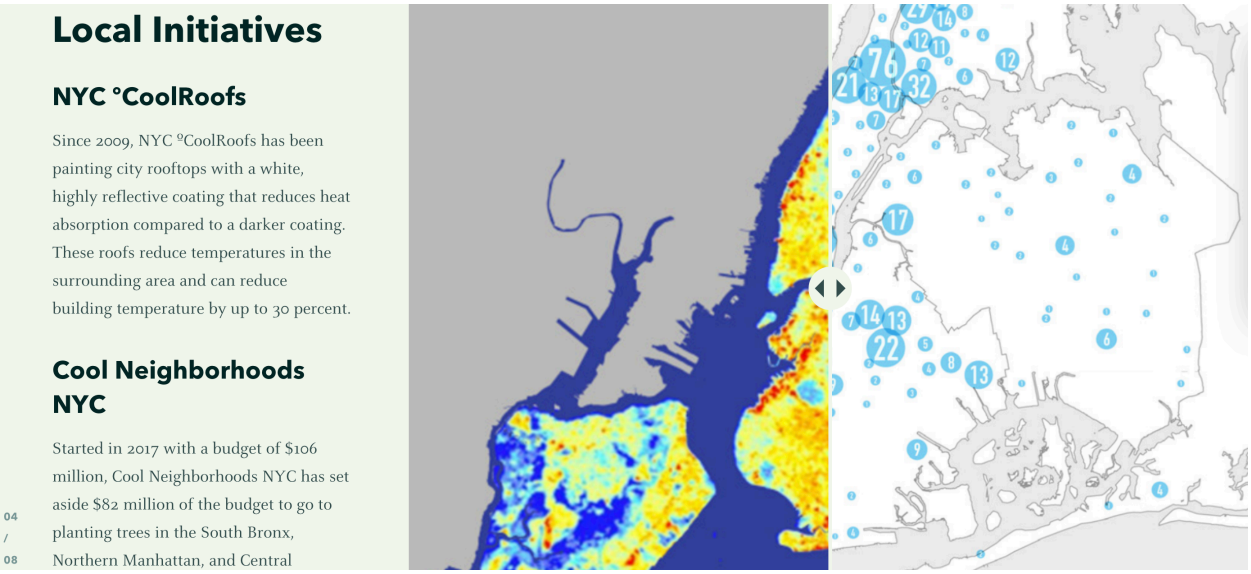
Tool: Urban Tree Canopy (UTC)	
Description:	Measures the layer of tree leaves, branches, and stems that provide tree coverage of the ground when viewed from above. The values are presented as a percentage of ground area that is covered by tree crowns. UTC assessments use top-down remote sensing or bottom-up on-the-ground tree surveys to measure existing urban tree canopy to identify the different types of forest in the community, including public (street trees, riparian corridors, parks) and private (residential, commercial, industrial areas) areas. This information can be used for establishing and implementing municipal tree canopy goals as part of broader urban greening and sustainability initiatives.
Where Was It Used?	Originally used to map and quantify land cover for Baltimore City, now used nationwide, including Canada. The assessment covers about 8.5 million acres, which is home to over 37 million people.
Who Used It?	UTC is used by the USDA and was developed by the U.S. Forest Service in 2006. Now, it is used nationwide.
What Did It Cost?	~$5 per 100 sq. ft.
What Was Learnt?	The aim of the UTC assessment is to help decision makers understand their urban forest resources, particularly the amount of tree canopy that currently exists and the amount that could exist at multiple scales. UTC can provide answers to finding where it is socially desirable and financially efficient to plant trees for communities. A UTC assessment is most useful when it is analyzed with other data layers, such as impervious surfaces, socioeconomic information, traffic density, and heat island maps.
Links	https://www.nrs.fs.fed.us/urban/utc/, https://www.nrs.fs.fed.us/urban/utc/data/, https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Urban%20Tree%20Canopy%20paper.pdf, https://sustainablecitycode.org/brief/expand-tree-canopy-cover-2/, https://www.edmondok.com/1403/What-is-Urban-Tree-Canopy
Images	Data Layers for UTC 

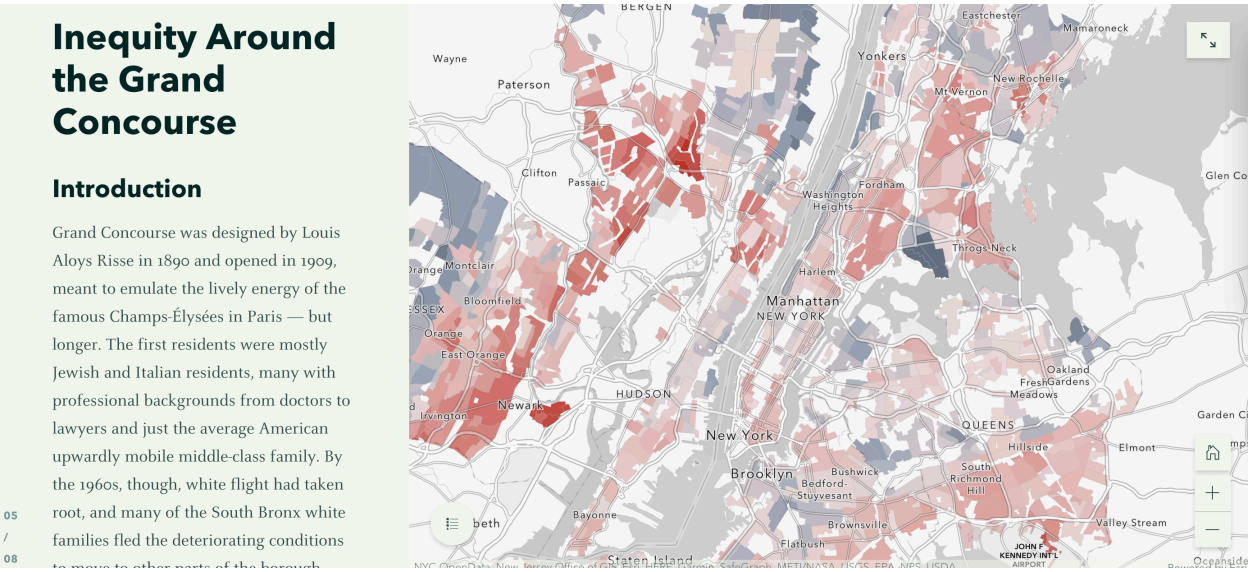
Tool: Impervious Surface	
Description:	Impervious surfaces are manmade hard areas such as roofs, driveways, or decks that do not allow precipitation to infiltrate the ground, instead causing rain or snowmelt to runoff. In built areas with impervious surfaces, water cannot soak naturally into the earth. Instead, it rushes across the landscape, carrying pollutants and biological contaminants into waterways, poisoning fish, wildlife, and people. Impervious surfaces contribute significantly to the urban heat island effect as asphalt, concrete and rooftops absorb the sun's energy during the day and subsequently re-release it at night.
Where Was It Used?	The method of measuring impervious surfaces is used around the world as a metric for water runoff as well as the urban heat island effect.
Who Used It?	In Vermont, for example, the Vermont Shoreland Protection Act establishes a maximum of 20 percent impervious surface area for a landowner's portion of their lot if located within the Protected Shoreland Area.
What Did It Cost?	Not sure about the exact cost, but in order to collect baseline data from the original large-scale photographs, expensive equipment is required, in addition to the significant amount of time necessary and hiring a professional photogrammetrist. However, after these precedents are created, the information should be more widely available for use, such as on ArcGIS.
What Was Learnt?	There are several methods for measuring impervious surfaces; stereo photogrammetry is the most accurate method for acquiring land cover information, using large-scale photographs and specialized equipment.
Links	https://nemo.uconn.edu/tools/impervious_surfaces/pdfs/NEMO_tech_3.pdf, https://news.climate.columbia.edu/2010/07/13/no-more-pavement-the-problem-of-impervious-surfaces/, https://sustainability-innovation.asu.edu/research/project/modeling_urban_impervious_surface_areas_in_relation_to_urban_heat_island_effects/, https://dec.vermont.gov/sites/dec/files/wsm/lakes/docs/Shoreland/lp_AppendixFImpervious.pdf
Images	

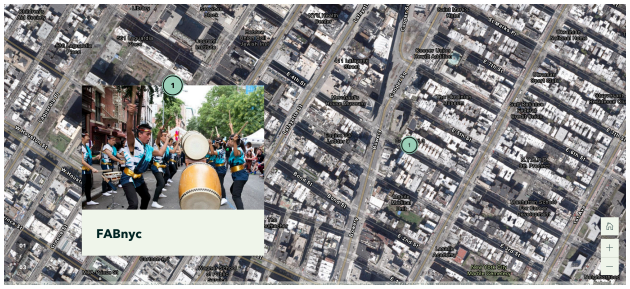
Tool: Wet Bulb Temperature	
Description:	Compared to your usual temperature measurement on your phone, wet bulb temperature accounts for both heat and humidity (ambient temperature, on the other hand, is also known as dry bulb temperature). Wet bulb temperature reflects what the combination means for the human body's ability to cool down. The term wet bulb comes from how to measure the metric, by wrapping a piece of wet cloth around the end of a thermometer to see how much evaporation can decrease the temperature. A study on wet-bulb temperatures published in Science Advances found that some places on Earth have already experienced conditions too hot and humid for human survival. Wet bulb temperature is important because, while air temperature is increasing, the moisture in the air is also increasing, which adds to the detriment of climate change. A Washington Post article notes that, as the climate continues to heat up, looking at the wet-bulb temperature before going outside to work or exercise could save people from heatstroke or worse.
Where Was It Used?	Across the world in the sciences.
Who Used It?	Mostly scientists, but citizens are becoming more cognizant of its importance.
What Did It Cost?	Not sure, but a wet bulb thermometer can be purchased on Amazon for less than $30.
What Was Learnt?	As the air around you gets more humid, your body is less able to sweat effectively, meaning you can't cool off as successfully. That's why dry heat feels more tolerable than extreme humidity. A wet-bulb temperature of 35°C marks humans' upper physiological limit, yet climate models project the first 35°C TW occurrences by the mid-21st century.
Links	https://advances.sciencemag.org/content/6/19/eaaw1838, https://www.washingtonpost.com/weather/2021/07/24/wet-bulb-temperature-extreme-heat/, https://www.sciencedirect.com/topics/engineering/wet-bulb-temperature
Images	 

ARCGIS Storymaps

I created an ARCGIS Storymap as another way to present information. I enjoyed creating the Storymap, because it provides a more immersive way of seeing information, especially in terms of mapping. It was interesting to overlay two different maps, one of the cooling centers in the New York City and the other a heat map of vulnerability in New York City, and see that not all of the hottest areas of New York City, specifically Hunts Point, had less cooling centers. Mapping is an important part to orienting oneself, as well as providing a new way of presenting public-facing information.







Introduction

Hunts Point is one of the neighborhoods with the highest risk of heat-related deaths. The neighborhood is located near the two heavy industries that fulfill the two city-wide necessities: bringing food in and getting waste out. It is also home to the largest wholesale produce market in the world and hosts more than a dozen waste-transfer stations. The South Bronx as a whole handles almost a third of New York City's waste. As a result, Hunts Point has one of the highest concentrations of truck traffic in New York City, with vehicles coming in and out and piping in hot exhaust which contributes to higher rates of asthma linked to pollution.

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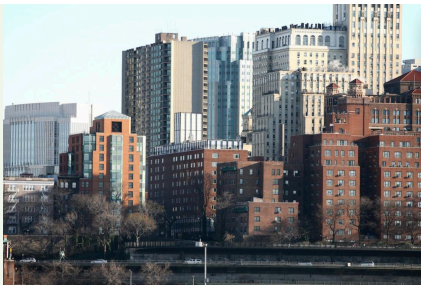
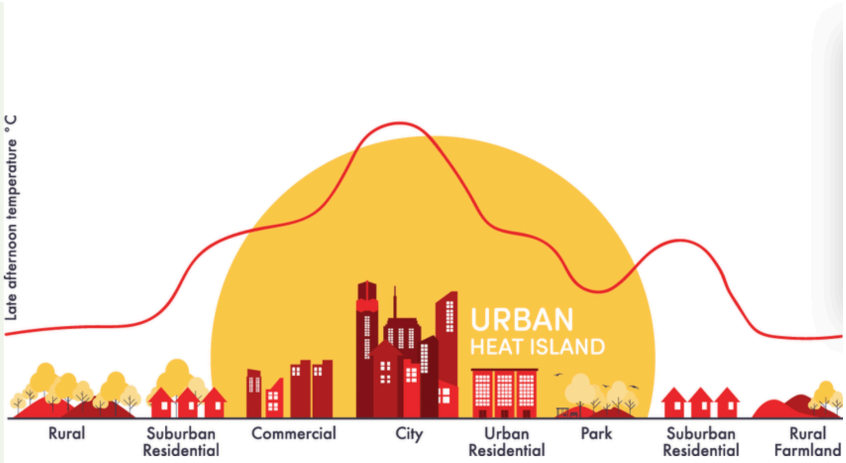


The Urban Heat Island Effect

The urban heat island effect can make a city 2-5 degrees warmer during the day and up to 22 degrees warmer at night. During the day, the lack of evaporative cooling in the city is somewhat mitigated by the higher heat storage. This heat flow reverses at night so that heat flows out, warming the air at night. When the next hot morning comes, yesterday's heat is still there. Higher temperatures also accelerate the formation of harmful smog, as ozone precursors combine faster to produce ground-level ozone, which exacerbates respiratory symptoms and diseases by damaging lung tissue, reducing lung function, and sensitizing

02 / 08



Strategies for Mitigation

Some causes of the urban heat island effect include:

- lack of vegetation
- widespread concrete
- asphalt
- tall buildings that block normal wind patterns
- dark colored paints and building materials (higher level of solar radiation absorption)

Intuitively, some solutions for mitigating theses issues begin with:

- increasing urban vegetation

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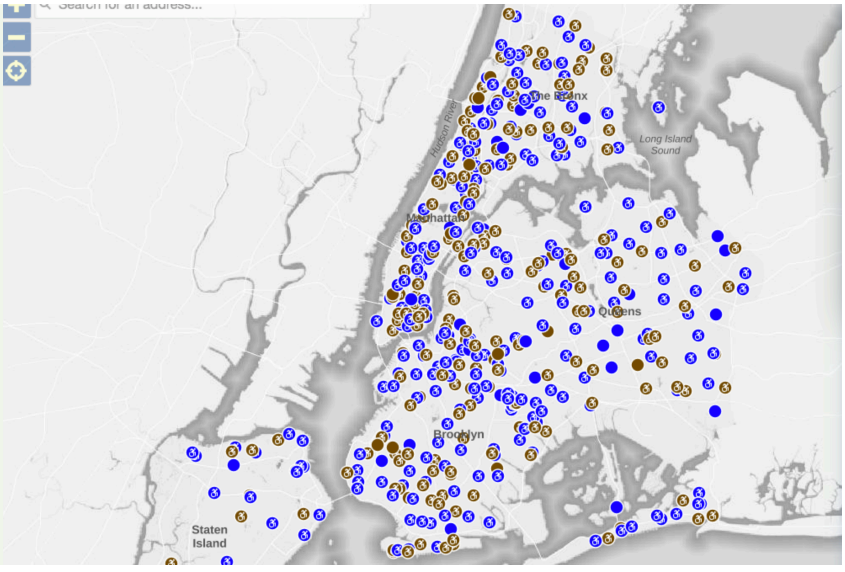
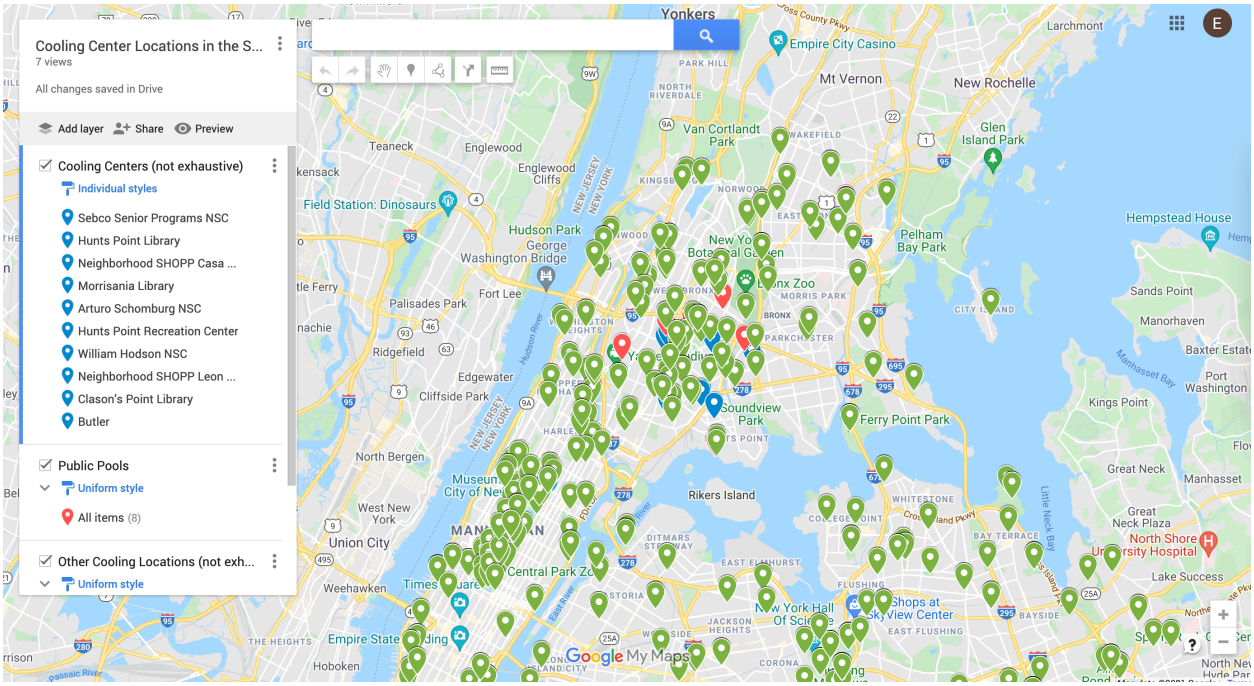


Google MyMaps of Cooling Centers, Public Pools, and Cooling Locations

One important piece of information that I created was a Google MyMaps of cooling centers in New York City. When talking with residents of the South Bronx through one-on-one interviews, and also in the Resident Council, one point that stood out most to me was the lack of information surrounding coolings centers—where they are located, when they are open, and how to get to them. One resident even mentioned that she chose to go to the local White Castle for air conditioning instead of finding a cooling center.

Inspired by these concerns, I created a Google MyMaps of the cooling centers in the South Bronx, as well as other public pools and cooling locations in New York City. Ideally, this map could be posted in apartment buildings for residents to see, as well as the information of when these cooling centers are open. If people know ahead of a heat wave where the cooling centers are located, especially the elderly or disabled, they can be better prepared to escape the heat during the events. An alternative to this map was a map that I created through Adobe Illustrator that includes cooling centers in the South Bronx, which can be found in my Feature 4 article.



Further Research: More Ideas

Some other ideas for public-facing information include a walking map, stickers, and a Stories of the South Bronx. I think a walking map that highlights the cultural monuments of the South Bronx while providing cooling centers along the way could be incredibly effective, as it not only promotes the cultural diversity of the area, but also informs residents of where cooling centers are located. Stickers that point toward the nearest cooling center could also be effective, making it easier for residents to identify cooling centers without searching for the information. Stories of the South Bronx could also be interesting, highlighting familiar faces of the area and asking them where they go to cool down, their favorite place to eat, and their favorite sounds of the South Bronx. All of these ideas not only provide strategies for heat mitigation, but also foster a community-led environment.