



Resilient Midwestern Cities

Improving Equity in a Changing Climate

By Cathleen Kelly, Miranda Peterson, Erin Auel, Gwynne Taraska, and Philine Qian April 2016

Center for American Progress



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Introduction and summary

The Midwest is known as America’s heartland and breadbasket, home to the Great Lakes. Despite the constancy of these iconic images, however, cities across the nation’s central region are adjusting to a new normal: more frequent and intense storms; heavy downpours; heat waves; and cold snaps. These dangerous effects of climate change hit hardest in low-income communities and communities of color, where residents confront daily the symptoms of historic inequities. These symptoms include economic instability as well as poor-quality housing, which is ill-equipped to weather safely severe storms, extended periods of stifling heat, and freezing temperatures.

Faced with growing risks of flooding, heat-related deaths, and poor air and water quality; skyrocketing energy bills; and costly damage to homes and infrastructure, some Midwestern city officials and community advocates are taking steps to improve their cities’ resilience to the effects of climate change. For example, cities such as Ann Arbor, Michigan; Chicago; Cleveland; St. Paul, Minnesota; and Toledo, Ohio, are implementing strategies such as installing green infrastructure; upgrading aging water, electric grid, and public transportation infrastructure; supporting home energy efficiency and weatherization; and strengthening community engagement and social cohesion. For many cities, building community resilience to climate change and other shocks is simply effective and efficient planning to meet community-specific needs.

Still, the financial burden of reducing climate change risks can be crushing for cash-strapped cities already struggling to modernize crumbling infrastructure and to improve the quality of city services. Under the strain of tight budgets, urban sustainability and resilience programs in the region are often underfunded, and they are sometimes designed by city and state officials without adequate input from community members or advocates.

This report includes case studies on how five cities—Ann Arbor, Chicago, Cleveland, St. Paul, and Toledo—are building resilience to climate change in low-income areas. These case studies reveal that reducing the risks of climate change in the region’s disadvantaged areas will require cooperation among many groups.

Midwestern city officials, state and federal policymakers, and community groups must work together to build upon ongoing social justice efforts to improve access to quality housing, infrastructure, and jobs; to promote equity and inclusivity; and to build trust between community members and government officials. These leaders also must connect resilience initiatives to related environmental justice initiatives and other community priorities, such as protecting public health and safety, improving air and water quality, and preserving local culture and history. Based on the findings from these case studies, this report recommends that policymakers:

- Ensure meaningful community engagement in designing resilience programs, partnerships, and policies, and improve public awareness of climate change risks and effects
- Assess the vulnerability of low-income communities to climate change and other environmental threats
- Improve the energy efficiency and weatherization of homes to reduce energy costs and carbon pollution
- Expand access to distributed solar energy in low-income communities in order to lower energy bills and carbon pollution levels
- Improve access to public transportation and bike-share programs to increase mobility and cut carbon pollution
- Plant more trees, community gardens, and other green infrastructure to reduce flood, urban heat island, and water pollution risks
- Strengthen social cohesion and networks to increase support during extreme weather events
- Leverage Community Development Block Grants from the U.S. Department of Housing and Urban Development to invest in resilient and equitable communities
- Recognize and support resilience and social justice leadership

By supporting these principles and actions—as well as efforts to curb lead contamination, improve emergency management services, and create green jobs in low-income communities and communities of color—policymakers and community leaders can help ensure a safe, healthy, and prosperous future for all people living in the Midwest region.

The Midwestern reality: Resilient and equitable communities are key for cities to thrive in a changing climate

The threats of climate change to U.S. coastal areas—from sea level rise to more frequent and severe storms such as hurricanes Sandy and Katrina—are often the focus of the media, policymakers, and advocates seeking climate change solutions. Although far from the country’s saltwater coasts, the Midwest also is threatened by climate change and is among the regions most vulnerable to climate change effects such as more extreme heat, heavy downpours, and flooding. These effects are putting infrastructure, public health, and air and water quality in the region at risk. For different Midwestern cities, climate change creates or exacerbates distinct sets of challenges. For this reason, when studied collectively, Midwestern cities offer insight into a diverse array of strategies to improve urban equity and climate change resilience. This section explores the socio-economic challenges, climate change threats, and types of resilience strategies that city and community leaders are using in areas that are hit hardest by the symptoms of a warming world.

Low-income communities and communities of color in the Midwest

The six Midwestern Great Lakes states—Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin—comprise one of the most populous regions in the country. Approximately 52.2 million people¹—one-fifth of the American population—reside there. All six of these states also rank within the top 20 for gross state product, or GSP,² outputs due to the strength of their agricultural, automotive, energy, aerospace, and transportation sectors.³

However, disparities run deep in the region. More than one-quarter of people of color in Great Lake states live with financial instability—with poverty rates at 27.5 percent for African Americans and 25.3 percent for Hispanics—compared with the 9.8 percent of non-Hispanic whites living below the federal poverty line.⁴

While the average unemployment rate in the Great Lakes states is 4.6 percent,⁵ African American unemployment is more than double that at 10.2 percent.⁶ The region was heavily affected by the 2008 economic crisis, which saw a rapid rise in home foreclosures and the number of high-poverty neighborhoods compared with other regions, especially within communities of color. Since 2000, there has been a 16.3 percent increase in the number of Midwestern African American residents living in areas of concentrated poverty and a 10.3 percent increase for Hispanic residents, many of whom are renters.⁷

What's more, toxins and other contaminants are more prevalent in low-income communities and communities of color: The current lead crisis affecting Flint, Michigan's, drinking water is a stark example of this injustice. Beyond Flint, Cleveland and Chicago have the most serious lead poisoning cases in Midwestern cities. Fourteen percent of children in Cleveland have elevated lead levels, mainly due to the persistence of lead paint in old buildings.⁸

These significant problems, in addition to other challenges facing low-income neighborhoods—older housing and infrastructure, income disparities, poor public health, high crime rates, failing schools, and fewer jobs—often perpetuate and entrench poverty across generations.⁹

Climate risks in the Midwest

People across the Midwest region are experiencing the high costs of climate change and extreme weather. Between 2010 and 2015, 36 percent of U.S. extreme weather events that caused more than \$1 billion in damage occurred in the Great Lakes states.¹⁰

Annual average temperatures in the Midwest have increased significantly over the past century, rising more than 1.5 degrees Fahrenheit since 1900. Recent yearly averages have increased even more sharply; between 1980 and 2010, warming rates were three times those between 1900 and 2010.¹¹ More heat waves in the region are worsening air quality, threatening public health, and increasing mortality, particularly in low-income communities, which experience higher rates of asthma.¹²

In the winter, the region is prone to cold snaps, or brief periods of extreme cold and biting wind chills. A growing body of climate science studies indicate that rapid warming in the Arctic is slowing down the jet stream, which typically prevents icy Arctic air from leaking down to lower latitudes;¹³ continued warming could increase the frequency of these cold snaps.¹⁴ In 2014, a slower and more slack jet stream brought frigid air down into the Midwest and Northeast regions of the United

States, causing the so-called polar vortex and setting local record lows across the region, including -25 degrees Fahrenheit and -17 degrees Fahrenheit in Flint and Cleveland, respectively.¹⁵ During the polar vortex, wholesale electricity prices in parts of the Midwest nearly tripled,¹⁶ causing financial burdens, particularly for low-income people.¹⁷ Those who cannot afford to pay for increased heating costs or for energy efficiency solutions are forced to endure the cold or, worse, to move.

The Midwest's warmer months bring regular precipitation with occasional heavy downpours that flood homes and businesses and overwhelm sewage systems. According to the 2015 National Climate Assessment, or NCA, precipitation events will become less frequent but more intense as the climate changes.¹⁸ Heavy downpours threaten public health and safety, particularly in cities with large expanses of impervious surfaces such as roads and parking lots. As rain flows into already strained drainage systems, sewage systems overflow into basements, lakes, rivers, and streams, damaging ecosystems, polluting drinking water, and putting public health at risk.¹⁹ According to the U.S. Army Corps of Engineers, the Great Lakes states are in need of approximately \$119 billion in upgrades to outdated drinking water and wastewater infrastructure.²⁰

Midwestern climate resilience

Low-income city residents in the Midwest are already feeling the disproportionate risks of climate change effects that come with financial instability, poor-quality housing and infrastructure, and minimal access to critical services, including home upgrade and disaster recovery programs that favor homeowners over tenants.²¹ To reduce the health and economic risks of climate change in all communities, and especially in low-income areas and communities of color, Midwestern cities must become more resilient and equitable. According to Chicago's Chief Sustainability Officer and Senior Policy Advisor Chris Wheat, "Cities like Chicago have been working on resilience for decades, but it wasn't always called that. Resilience is just part of smart and equitable planning."²² Increasingly, city and community leaders define community resilience as action that creates opportunities for communities to "bounce forward"—that is to say, to become more sustainable and prepared to meet the challenges and risks of extreme weather and economic opportunities of the 21st century.²³

As the case studies in this report reveal, climate resilience initiatives look somewhat different across cities and states in the Midwest region. But the most effective programs and policies—as demonstrated in this report—promote social justice and inclusive economic growth and are designed and implemented with meaningful engagement of community members and groups.

City case studies

In the Midwest, several cities stand out as leaders, taking innovative steps to reduce climate change risks and to increase access to jobs, cleaner air, and water in low-income areas and communities of color. For example, Ann Arbor, Chicago, Cleveland, St. Paul, and Toledo are implementing a range of projects and initiatives to improve community equity and resilience, from green infrastructure and home energy efficiency to water, electric grid, and public transit infrastructure upgrades. These and other resilience initiatives by these five Midwestern cities are described below.

Ann Arbor: Building resilient communities through public housing and transit

Although Ann Arbor, Michigan, lacks the distressed communities found in nearby Detroit, it has an approach to city planning that is mindful of the dual needs to build sustainability and address the most pressing needs of low-income communities. “The city developed its “Sustainability Framework” in 2013—a set of 16 overarching goals that the City Council adopted as an element of its ‘Master Plan’—and equity is built into each of these goals,” says Matthew Naud, the city’s environmental coordinator.²⁴ This holistic approach to city planning is evident in Ann Arbor’s current initiatives to provide equitable access to public transit and access to safe, healthy, and affordable housing.

Efficient and affordable housing

Energy efficiency is a key tool to help Ann Arbor reduce its greenhouse gas emissions, given that buildings account for a significant share—77 percent—of its total emissions and that energy efficiency improvements lower energy use.²⁵ But energy efficiency improvements are also integral to low-income community resilience, given that they lower energy costs while simultaneously protecting against the worst effects of extreme heat and cold.²⁶

The Ann Arbor Housing Commission is currently engaged in a high-efficiency overhaul of its entire portfolio of 18 public housing sites through renovation or rebuilding, according to Jennifer Hall, its executive director.²⁷ Among the improvements are efficient lighting and appliances, efficient heating and cooling equipment, water conservation devices, insulation, and air sealing. At the end of the project, the commission expects to have 418 energy efficient apartments.²⁸

To lower energy costs further and promote sustainability, in September 2015, the Ann Arbor Housing Commission completed a 42-kilowatt solar array on its largest property, Miller Manor.²⁹ The solar power system, which spans approximately 10,000 square feet of roof space, is expected to generate enough electricity to cover common-area usage, or 8 percent to 10 percent of the total electricity needs for more than 100 apartments.³⁰ The commission now aims to raise funds for solar arrays in three new construction projects to cover common-space energy use and more.

The efficient and affordable housing initiative has health benefits as well, notes Jason Bing, healthy buildings director at the Ecology Center, a nonprofit that is partnering with the housing commission. “The project has aimed to reduce or eliminate toxicity and protect tenants with better materials,” he says.³¹ Hall notes that avoiding toxic materials and improving ventilation are of particular importance given that Ann Arbor’s public housing serves many people, such as elderly residents, who tend to spend more time at home.³² The commission also has community spaces at two of its apartment sites—and is building a third—that can serve as emergency centers during times of extreme weather.³³

Sustainable and equitable transit

Limited public transit is an acute problem in low-income communities: Restricted access to doctors’ offices, grocery stores, pharmacies, and places of employment has adverse health and economic effects. A major initiative is therefore underway in the Ann Arbor area to increase equitable access to public transit. Although bus service has been widely accessible in the city of Ann Arbor itself, the neighboring city of Ypsilanti—which is less economically prosperous—has had more limited service, including limited night and weekend service.³⁴ Public transit improvements not only strengthen low-income communities and contribute to social justice but also dovetail with climate efforts through air quality benefits and reductions in greenhouse gas emissions, insofar as private cars create more air and carbon pollution.

The Ann Arbor Area Transportation Authority, or AAATA, proposed a transit millage to generate more than \$4 million for a five-year transit improvement program and bus service expansion.³⁵ Ann Arbor, Ypsilanti, and Ypsilanti Township voters approved the millage in 2014. “We’re increasing service by 44 percent, and a lot of that increase will be going to the Ypsilanti area to boost their transit to an appropriate level,” says Sarah Pressprich Gryniewicz, a business analyst with the AAATA.³⁶

The initiative will contribute to meeting local climate action plan goals to enhance public transit and provide transit within a quarter-mile of every household in Ann Arbor.³⁷ The AAATA also is seeking to reduce its carbon footprint, and it completed a sustainability plan with emissions reduction targets for 2030 and 2050 in October 2015.³⁸

Chicago: Building a more resilient and equitable city

Chicago is a city defined by contrast. A mere 15-minute drive separates high-end lake side neighborhoods from the city’s poorest communities. The 22.6 percent of Chicagoans living below the federal poverty line cope daily with high crime rates, failing schools, high unemployment, and limited access to healthy food and other essential services.³⁹

As average temperatures rise, experts suggest that Chicago’s heat waves and heavy rainfall—the city’s two leading climate change risks—are becoming more frequent and intense.⁴⁰ The disproportionately worse effects of heat exhaustion and flooding in Chicago’s low-income areas are alarmingly evident: During a deadly 1995 heat wave, 739 individuals died from heat-related causes, mainly in the city’s poorest neighborhoods of Englewood, Fuller Park, and Roseland.⁴¹ In low-income areas, poorly built homes are not well-insulated and often lack air conditioning, making heat waves and extended cold snaps painful and dangerous, driving up heating and cooling costs for those who do have air conditioning, and straining already tight household budgets.

Chicago relies heavily on the city’s 120-year-old sewer system, which can cause flooding during rain storms and may cause sewage-infused flood waters to seep into streets and basements.⁴² Additionally, many neighborhoods, particularly in low-income areas, are heavily paved, with roads, parking lots, and asphalt that radiate the sun’s heat and prevent the ground from absorbing rainfall, exacerbating heat and flood risks.⁴³

Chicago's sustainability and resilience agenda

In 2012, Mayor Rahm Emanuel (D) launched the Sustainable Chicago 2015 Action Agenda, which committed the city to a number of actions, including planting and expanding urban parks and gardens, improving energy efficiency and access to clean energy, and supporting transit-oriented development.⁴⁴ Since the agenda's launch, the city has rebuilt or refurbished 225 parks and has installed other green infrastructure to help reduce the growing risks of floods and heat waves.⁴⁵ On severely hot days, Chicago activates its six cooling centers—air-conditioned facilities where residents can find relief from extreme heat—which people can locate by calling 311.⁴⁶ The city also has doubled its investment in water infrastructure, spending more than \$250 million annually since 2015 to expand and modernize the sewer network.⁴⁷ In April 2016, the city of Chicago hired a chief resilience officer to oversee and strengthen its resilience planning efforts.⁴⁸

In 2014, *Bicycling* magazine rated the Windy City the second-best cycling metropolis in America because of its highly successful Divvy bike-share program—which is quickly expanding to low-income areas—and because of Mayor Emanuel's plan, initiated in 2011 when he took office, to build 100 miles of protected bike lanes by 2015.⁴⁹ In July 2015, Chicago cut the annual Divvy membership fee from \$75 to \$5 for residents who do not have a credit card or debit card and who earn less than \$35,000 each year.⁵⁰

Latrice Williams, director of garden initiatives at the Urban Juncture Foundation, is leading community-based resilience and equity efforts in the Bronzeville neighborhood on Chicago's South Side. From community gardens to bike programs, a roof top farm, rain barrel workshops, and healthy cooking demonstrations, Williams is supporting local initiatives that build on the neighborhood's rich African American history of art, culture, and thriving local businesses. These initiatives also lower carbon pollution, improve air quality, fight food deserts—or areas that lack grocery stores, farmers markets, and healthy food providers—reduce flood risks, and promote healthy living.⁵¹

The Center for Neighborhood Technology also leads an innovative initiative to help communities better weather more frequent floods and droughts. The center's RainReady program works with residents to coordinate home building, plumbing, and landscaping upgrades and to install permeable pavement, smart water meters, and rain sensors.⁵²

'Meet the people where they are'

In a warming world, extreme weather risks and information about these risks are not evenly shared. According to Williams, “The unequal distribution of resources and information needed to reduce climate change risks leaves low-income communities more vulnerable. The digital divide plays into this: Information may be available online but not at schools, churches, or community centers.” To fix this, Williams says, “You need to meet the people where they are.”⁵³

In 2013, the Chicago-based Institute of Cultural Affairs in the USA, or ICA, launched the Chicago Sustainability Leaders Network, or CSLN, to connect the city’s community grassroots leaders to share resources and support collaboration.⁵⁴ According to Seva Gandhi, program director at the ICA, the network has engaged roughly 150 community groups aiming to create more inclusive, just, and sustainable communities.⁵⁵

In 2015, the CSLN developed five principles for city sustainability programs, partnerships, and policies: prioritize equity and inclusivity; ensure meaningful community engagement; conserve community history and culture; advocate for public space; and create collaboration and citywide connection.⁵⁶

“The city of Chicago has a history of top-down decision-making,” Gandhi says.⁵⁷ Chicago will begin to develop a new sustainability plan this summer, and Gandhi hopes that the city will embrace the CSLN’s five principles and listen to community groups in the process.⁵⁸

Some of Chicago’s most creative sustainability, resilience, and equity strategies come from low-income communities. “We have found that community groups in Chicago’s [low-income] South and West Sides are spearheading some of the most innovative sustainability approaches by understanding that climate change is complex, part and parcel of many other challenges communities face,” Gandhi says. “You can’t talk about environmental justice without talking about social justice, and we have found some of the most impactful projects are those taking this type of holistic approach to change-making in communities.”⁵⁹

Cleveland: Neighborhood-led resilience

The city of Cleveland faces poverty rivaled in the United States only by Detroit: More than one-third of its total residents and half of all its children live in poverty.⁶⁰ Mindful of the fact that climate change disproportionately harms communities with existing economic and social hardships, Cleveland has focused on initiatives that address the most pressing needs of challenged communities while also building climate resilience.⁶¹

Cleveland is rich in distinctive neighborhoods, each with its own history and character. Building on this existing strength, the city has developed a progressive, community-centric approach to low-income climate resilience that is evident in its plans and its many green-space initiatives.

Climate Resilience and Urban Opportunity Plan: A bottom-up approach

The Cleveland Climate Resilience and Urban Opportunity Plan includes a range of ideas to build low-income resilience, including targeted energy efficiency and stormwater management programs.⁶² Led by the non-profit Cleveland Neighborhood Progress in collaboration with the city of Cleveland, Kent State University, Environmental Health Watch, and the University at Buffalo, the plan focuses on four representative Cleveland neighborhoods, including both distressed and economically diverse communities.⁶³

Rather than dictating climate policies, the plan aims to support neighborhood-led solutions. “The model is bottom up instead of top down, with a focus on social cohesion,” says Matthew Gray, director of the Cleveland Office of Sustainability.⁶⁴ To implement this bottom-up model, the initiative is training neighborhood members in climate science and the local effects of climate change—including the effects on public health and water quality—so that they may serve as climate ambassadors who work with neighborhoods to identify the projects that best respond to local needs. “This approach allows us to pinpoint the reality of community challenges and to organize resources accordingly,” says Terry Schwarz, director of the Cleveland Urban Design Collaborative at Kent State University. “We ask about energy bills and about asthma—about the way that climate change manifests in peoples’ lives.”⁶⁵ The plan was completed in 2015; implementation began in January 2016 and will run through 2018.⁶⁶

Cultivating green spaces: Urban tree canopy and urban agriculture

Although known as “The Forest City,” Cleveland has lost half of its street trees since the 1940s and loses nearly 100 acres of tree canopy annually, due to a variety of factors including development, pests, and disease.⁶⁷ This is a particular problem from the perspective of low-income resilience, given that trees help improve air quality and respiratory health; increase property values; counteract high heat, with benefits for health and energy costs; and reduce flooding by absorbing rainwater.⁶⁸

In order to reverse the trend of tree loss, the city has partnered with a number of organizations to create the Cleveland Tree Plan, which was adopted by the Cleveland City Planning Commission in early March 2016.⁶⁹ “The tree plan has a strong focus on the equitable distribution of canopy,” says Gray.⁷⁰ In order to maximize the socio-economic and environmental benefits of canopy restoration, the plan includes an equity index by neighborhood so that communities with the most need can be prioritized.⁷¹

A second facet of the green-space movement in Cleveland is its strong record of urban agriculture. There are now more than 300 community gardens and urban farms in the city, which has multiple benefits for low-income resilience.⁷² These initiatives can transform vacant lots, promote access to healthy food, reduce heat through the replacement of pavement with vegetation, and promote economic development by attracting businesses and even providing employment.

The Urban Agriculture Innovation Zone in the Kinsman neighborhood, for example, has created an inner-city agricultural district from more than 20 acres of previously vacant land.⁷³ Within this district are initiatives including Kinsman Farm, an incubator farm that provides land to gardeners learning to farm at scale, and the Rid-All Green Partnership, an urban farm with an education program that produces vegetables and tilapia.⁷⁴ Chateau Hough, named for the Hough neighborhood, is an inner-city vineyard with nearly 300 vines that was developed with support from Reimagining Cleveland, an initiative to transform vacant lots.⁷⁵

St. Paul: Designing resilience strategies where it counts—in the community

In the lower 48 states, chilly Minnesota holds the record for fastest-warming winters.⁷⁶ The state’s famous 10,000 lakes remain uncovered by ice for longer stretches each year, and Minnesota has been hit by a growing number of damaging storms, summer heat waves, and treacherous subzero cold snaps.⁷⁷

Although Minnesota has some of the lowest poverty and unemployment rates in the country, the Minneapolis-St. Paul metropolitan region has one of the largest income gaps between whites and people of color in the United States, with the largest concentration of racial economic disparity in St. Paul.⁷⁸ In low-income communities such as the Frogtown neighborhood, air conditioning for many is an unaffordable luxury, and the aging and poorly built housing is often not insulated to keep out the cold on bitter days.⁷⁹

The city of St. Paul is taking steps to reduce the risks of climate change to its residents, including in low-income areas and communities of color. St. Paul has a long history of climate action that dates back to the early 1990s.⁸⁰ The city is currently in the process of formulating an inclusive climate action plan and is planning and implementing initiatives to build resilience and cut carbon pollution through smart transportation, food, energy, and water policy.⁸¹

In 2015, St. Paul Mayor Chris Coleman (D) launched the Sustainable Saint Paul Awards to recognize citizens, businesses, and community groups who are working to make St. Paul more environmentally friendly and livable.⁸² Honorees included teens from Frogtown, who conducted focus groups on barriers to walking and biking in their neighborhood; the Face to Face program, which organizes wilderness experiences for at-risk youth that qualify as credits for high school graduation; and Payne Phalen Pocket Parks, a grassroots program to turn the space around vacant lots and foreclosed properties into community gardens and public art spaces.

Even in a forward-leaning city such as St. Paul, Christie Manning, visiting assistant professor in the Environmental Studies and Psychology departments at Macalester College,⁸³ says that meaningful public engagement on climate change policy development and planning can be a challenge. “Getting people to show up who already care is easy,” Manning says. “It’s reaching the people who don’t know [the risks of climate change to their communities] that is hard.”⁸⁴

In an effort to change this dynamic, the St. Paul Mayor’s Office, Macalester College, and the Science Museum of Minnesota launched the three-year Community Climate Change Conversations project in 2013 to support public education and resilience capacity building in four St. Paul districts with low-income communities.⁸⁵

Several individuals from each community volunteered as community partners for the project and helped build inroads to neighborhoods by personally inviting community members to the workshops. The workshops also provided child care, meals, and a \$50 stipend for workshop participants to encourage participation.⁸⁶

Participants were given a primer on climate change risks to their communities and the city as a whole. They then discussed how climate change affects them personally and the importance of social cohesion to reduce climate change risks to vulnerable community members, including the elderly.⁸⁷ According to Manning, workshop participants “were very concerned about the social justice aspects of climate change. That became clear.”⁸⁸

Workshop participants also were invited to a listening session with Mayor Coleman and other city leaders to share their perspectives on their communities’ climate vulnerabilities and resilience needs.⁸⁹

In 2015, the project provided grants between \$500 and \$2,500 to participants to implement resilience and sustainability strategies that they helped develop during the workshops, including holding more climate education sessions to engage more community members; environmental justice classes for at-risk youth; a neighborhood environmental newspaper; and projects to strengthen community networks to help people get the support they need during extreme weather events.⁹⁰

Manning described the project as having “a relatively small budget” but a big payout for collaborating with communities and engaging residents to build resilience and sustainability strategies from the bottom up.⁹¹ Manning added that “it was very encouraging that social networks and a sense of community were seen as so key to facing unpredictable times. People at our meetings came to that conclusion on their own.”⁹²

Toledo: Climate change brings water management to the forefront of city planning

What do you do when 400,000 people lose their access to clean water?⁹³ That was the emergency facing city officials in Toledo, Ohio, for two days in August 2014 after a toxic algal bloom settled right over the city’s water intake pipes in Lake Erie.⁹⁴ City officials set up free water distribution centers in communities across Toledo.⁹⁵ Without a quick response to the emergency from the city, the nearly 30 percent of the city’s residents living in and on the edge of poverty would have been hit hard by the crisis.

Katie Rousseau, director of clean water supply for the Great Lakes at American Rivers, has seen firsthand that water incidents can affect Toledoans unequally. “The City did a great job of distributing free water to everyone,” Rousseau said, “but people know this can happen again at any time. I walk around my neighborhood and there are garages full of water just in case another crisis happens. I can’t imagine not being able to afford to save a few extra bottles of water for my family to drink or mix baby formula with [during water shortages].”⁹⁶

Water quality

In Toledo, an increase in intense storms and midwinter snowmelts brought by a changing climate are putting water quality at risk.⁹⁷ Across the Great Lakes, a rising volume of stormwater runoff is eroding fertilizer-laden soil from farms and sweeping this soil, along with street pollution and untreated sewage from urban environs, into Lake Erie.⁹⁸ Hazardous algal blooms in the lake are becoming an increasingly common threat to the water supply, as an increase in hot, sunny days feeds the pollution-loving algae.⁹⁹ “Every time we get a lot of snow or rain and then hot weather right afterwards, we are at a [water quality] tipping point,” says Patekka Bannister, the city of Toledo’s chief of water resources.¹⁰⁰ To alert residents to water quality problems, in 2015, the city launched an online dashboard, which communicates real-time water quality readings to the public.¹⁰¹

Flooding

Despite improvements in water quality monitoring and public awareness, the city’s long history of development over wetlands, which dates back to before its founding, makes Toledo highly susceptible to flooding and drainage issues.¹⁰² Water management is a growing challenge for the city, with chronic flooding and mold becoming everyday hazards for Toledo residents. Less than an inch of rain or snowmelt can overwhelm the city’s stormwater and wastewater systems and cause a mix of sewage and stormwater to back up into streets, driveways, and basements.¹⁰³ In 2014, the city received 1,078 requests for service due to sewage-steeped floodwater in residents’ basements.¹⁰⁴

In Toledo, home foreclosure rates were increasing even before the city was hit hard by the subprime mortgage crisis of 2007.¹⁰⁵ More frequent and damaging storms threaten to further reduce property values and access to safe and affordable housing, including for residents already living in public assistance housing.¹⁰⁶

Tackling the issue

In 2014, the city of Toledo and Lucas County released its “Going Beyond Green” sustainability plan with goals to jump-start planning to address the area’s growing climate and social equity challenges.¹⁰⁷ Priorities outlined in the county plan include developing a detailed regional climate action plan; improving energy efficiency in buildings; increasing pedestrian-friendly planning; and increasing access to local, healthy foods.¹⁰⁸ Through these efforts, city and county officials aim to deliver the triple bottom-line benefits of improving the area’s natural systems, economic strength, and social equity.¹⁰⁹

The city is also in the final stages of implementing the Toledo Waterways Initiative, an 18-year, \$521 million capital improvement plan to alleviate combined sewer backups.¹¹⁰ The initiative aims to cut untreated stormwater and wastewater runoff by 80 percent.¹¹¹ Local leaders and federal partners are also prioritizing various green infrastructure strategies, from sand filters to green roofs, which are estimated to save Toledo an estimated \$90,000 annually in avoided water pollution and flood damage costs to buildings.¹¹²

The Toledo-Lucas County Green Infrastructure Task Force, which sprung out of the area’s sustainability plan, is exploring ways to bring green infrastructure to disadvantaged areas.¹¹³ In low-income areas of Toledo such as the Maywood Avenue and Junction Avenue communities, rain gardens, bioswales, and permeable pavement installations help reduce threats and damage from flooding and water pollution and build home equity.¹¹⁴ According to Bannister, these projects help address other community priorities, including reducing crime by turning vacant lots into community gardens, beautifying neighborhoods, and improving access to waterways.¹¹⁵ Community members work together to maintain green infrastructure, which supports local project ownership and community.

Started by Rep. Marcy Kaptur (D-OH), the Rain Garden Initiative of Toledo-Lucas County—a collective of 16 governments and organizations including the city of Toledo—holds regular public workshops, such as rain barrel installation trainings,

in an effort to support education and engagement with at-home green infrastructure solutions.¹¹⁶ The city also has reached out to private sector partners, such as General Motors, whose engineers organized a weeklong watershed academy and rain garden installation for kids at the Frederick Douglass Community Center.¹¹⁷

Bannister is cautiously optimistic about efforts by the city of Toledo and partners to reduce the city's climate change risks. "While Toledo can't control the climate or pollution from upstream," Bannister says, "we can manage our infrastructure needs and curb the pollution we are putting into waterways."¹¹⁸

Recommendations

The case studies in this report demonstrate the need for well-designed local initiatives to build equitable climate resilience. In many cases, these initiatives can be coupled with federal policies and programs to leverage additional action to address the threats of climate change in low-income communities. The recommendations below highlight effective approaches to enhancing climate resilience in low-income communities and communities of color; policymakers should embrace these approaches to maximize their success in strengthening community resilience in the Midwest—and across the United States.

Ensure meaningful community engagement in designing resilience policies, and improve public awareness of climate change risks and effects

Community leaders across the country consistently make the case that resilience programs are often successful when they support existing community priorities and are designed and implemented with community member input and buy-in.¹¹⁹ Community, city, and state leaders should work together through new and existing programs to communicate the effects and risks of climate change to residents, as Cleveland, St. Paul, and Toledo have aimed to do. Communities that are well-informed of oncoming extreme weather are better able to prepare and prevent injury and costly damage to their homes and are more likely to support strategies to reduce carbon pollution and climate change risks.¹²⁰

Assess the vulnerability of low-income communities to climate change and other environmental threats

As the case studies demonstrate, extreme weather events exacerbate the health, safety, and financial problems that low-income communities and communities of color are already facing.¹²¹ Low-income individuals may only be capable of affording cheaply built and/or very old housing that is highly exposed to climate change hazards.¹²² Unforeseen crises such as natural disasters jeopardize struggling families'

ability to keep up with daily expenses and may drive them into poverty.¹²³ Finally, low-income households typically rent homes rather than purchasing them; this creates problems when homeowners are heavily favored for disaster aid in times of crisis, and rental prices skyrocket when rental units are destroyed due to extreme weather circumstances.¹²⁴ Federal agencies should expand support to cities to assess the climate change vulnerability of low-income communities, and Congress should ensure that federal agencies have the resources to provide the support that communities need to understand their climate change risks. City and state officials should conduct data-driven assessments of services available to low-income people and their vulnerabilities to climate change, as has been done in Chicago.¹²⁵

Improve the energy efficiency and weatherization of homes to reduce energy costs and carbon pollution

Weatherization and energy efficiency programs help improve the quality and safety of homes while lowering residents' energy bills and improving indoor air quality, particularly during heat waves and cold snaps.¹²⁶ The U.S. Department of Energy's, or DOE's, federal Weatherization Assistance Program, or WAP, provides grants to states to fund home efficiency upgrades for low-income people in cities across the Midwest and the United States.¹²⁷ Energy efficiency greatly benefits low-income households, as households making less than \$50,000 per year spend 21 percent of their income on energy bills, compared with only 9 percent for higher-income households. A 2014 DOE evaluation of WAP found that it provided \$4,890 in benefits per upgraded household; reduced average household electricity consumption by 7 percent; and cut carbon pollution in the United States by 2,246,000 metric tons in 2008 alone.¹²⁸

However, WAP currently has a multiyear waiting list, which is projected to increase because the program is vastly underfunded.¹²⁹ Congress should authorize additional funding for WAP, as requested by President Barack Obama in his 2017 budget proposal. Additionally, city and state officials can encourage landlords of multifamily housing properties to take advantage of federal incentives for efficiency measures, such as the partnership between the Environmental Protection Agency and Freddie Mac that seeks to incorporate efficiency measures into financial valuations and loan underwriting of multifamily buildings.¹³⁰

Expand access to distributed solar energy in low-income communities in order to lower energy bills and carbon pollution levels

By installing distributed energy, such as rooftop solar, households can save money that can be used for other expenses.¹³¹ With the cost of rooftop photovoltaic solar panels plummeting, installations have skyrocketed across the Great Lakes as customers seek to lower energy bills.¹³² Nonetheless, people in low-income communities and communities of color face barriers to installing rooftop solar power; these barriers include meeting credit requirements for solar leases, insufficient income to take advantage of incentives, and lack of decision-making authority over roof space due to residents' status as tenants.¹³³ Federal, state, and city officials should target solar incentives and information-sharing toward low-income communities and communities of color by expanding community solar programs, like the efforts in Ann Arbor, and by working with community development organizations to leverage tax credits and bulk purchase agreements for solar installations.¹³⁴

Improve access to public transportation and bike-share programs to increase mobility and cut carbon pollution

Functional and affordable public transportation is crucial to city residents, particularly in low-income areas. As the Center for American Progress has previously reported, a lack of public transportation in many low-income communities can build barriers to affordable housing and to good jobs and schools, public services, and fresh food.¹³⁵ Upgrading and expanding access to public transportation—including affordable bike-share programs such as the one in Chicago—can help address these issues, in addition to cutting carbon pollution, reducing traffic congestion, and improving public health.¹³⁶ Also, without safe transportation options, low-income residents in particular face obstacles to getting out of evacuation zones and to shelters before extreme weather events hit and to returning to work and school after severe storms.¹³⁷

Plant more trees, community gardens, and other green infrastructure to reduce flood, urban heat island, and water pollution risks

With 80 percent of the American population now living in cities, it is more important than ever that strategically targeted tree-planting and green infrastructure become part of urban development plans.¹³⁸ As Chicago, Cleveland, and Toledo have demonstrated, planting and maintaining rain gardens and trees are one of the most cost-effective actions to conserve energy, cool urban heat islands, and reduce the amount of rainwater and snowmelt runoff that pollutes waterways and causes flooding.¹³⁹ In addition to their environmental benefits, tree-planting and rain gardens also improve property values, quality of life, social cohesion, and aesthetic beauty while reducing noise pollution, stress, and violence in many areas.¹⁴⁰ Federal, state, and city leaders should expand investments in low-cost, high-benefit green infrastructure to help create more vibrant, livable, and healthy communities. For example, a \$10 million investment by the federal government would allow approximately 70,000 trees to be planted in 10 cities across the Midwest region—with \$1 million for each city—to reduce flood risks, health impacts, and crime rates.¹⁴¹

Strengthen social cohesion and networks to increase support during extreme weather events

Strengthening the social cohesion of low-income areas, such as efforts in Chicago and St. Paul, improves resilience, as residents are more likely to get the support they need before and during emergencies and are able to return to daily life more quickly in the aftermath of extreme weather.¹⁴² According to previous CAP analysis, local and state governments can enhance social cohesion by regularly communicating with community leaders, municipal officials, and residents in low-income communities about emergency management plans and ways to improve extreme weather response that are specific to communities' climate vulnerabilities and resilience needs.¹⁴³ Governments also can support efforts by community leaders to seek input from residents on climate resilience strategies at community events and gathering places such as block parties, fairs, schools, and community centers.

Leverage Community Development Block Grants from the Department of Housing and Urban Development, or HUD, to invest in resilient and equitable communities

More than 1,200 units of government—including the cities mentioned in this report—use Community Development Block Grants, or CDBGs, to invest in safe and affordable housing, strengthen infrastructure, and foster economic opportunity in low- and moderate-income communities.¹⁴⁴ Many CDBG awards are already used in ways that build resilience, such as improving home weatherization and reducing flood risks through green and gray infrastructure, including improved sewer and drainage systems.¹⁴⁵ HUD should embrace these successes and shape this powerful tool to build resilience in vulnerable communities nationwide.¹⁴⁶ By implementing climate risk training for federal CDBG officers and award criteria for applicant communities, HUD can initiate more conversations between federal and local partners about ways to build resilience to alleviate current and future climate change effects.

Recognize and support resilience and social justice leadership

As this report has demonstrated, groundbreaking ideas from across the country often come from people working on the ground within communities, and these ideas can do even more good when leaders adopt them in other areas. With these idea-sharing tactics in mind, the White House created the Champions of Change initiative to amplify best practices across a wide range of issues, including recognizing 12 leaders who have helped build community climate resilience.¹⁴⁷ The White House should continue to recognize and amplify the success of local leaders, including those effectively working with low-income communities to reduce climate risks and to improve social justice and inclusive economic development.

Conclusion

Faced with rising climate change risks, cities across the Midwest are taking action to increase resilience and build upon ongoing community efforts to improve social and environmental justice. Resilience initiatives, when well-designed through an inclusive process, help local leaders pursue priorities such as increasing access to high-quality jobs, affordable housing, and clean energy; protecting public health and safety by lowering extreme weather risks and improving air and water quality; and other community efforts, such as fighting crime and building culturally vibrant and cohesive communities. Climate resilience efforts will vary across cities and states, but effective programs and policies will prioritize social justice hand in hand with sustainability and will strengthen communities and grow opportunities for all community members to prosper.

About the authors

Cathleen Kelly is a Senior Fellow at the Center for American Progress. She specializes in international and U.S. climate mitigation, preparedness, resilience, and sustainable development policy. Kelly served in the Obama administration at the White House Council on Environmental Quality, where she led a 20-plus agency task force to develop a national climate resilience strategy. This strategy helped form the basis of the climate preparedness pillar of President Barack Obama's Climate Action Plan. Kelly also helped formulate the Obama administration's positions on international sustainable development and climate policy issues.

Previously, Kelly directed the Climate & Energy Program at The German Marshall Fund of the United States, where she led a highly acclaimed paper series and events on climate and clean energy policy that drew the world's top energy and climate policy players. She also held policy director and senior policy adviser positions at The Nature Conservancy and the Center for Clean Air Policy. Kelly was also a professor of international and environmental policy at the Johns Hopkins University Paul H. Nitze School of Advanced International Studies, or SAIS. Kelly is a prize-winning graduate of SAIS, where she earned a master of arts in international relations and energy and environmental policy.

Miranda Peterson is a Research Assistant for the Energy Policy team at the Center. She works on North American climate strategy and resilience policy. Prior to joining the Center, Peterson worked in the U.S. Department of Homeland Security's Office of Infrastructure Protection, where she assisted with terrorist and extreme weather preparedness. Previously, she was an education intern at Earth Day Network and joined that organization again as a team member for the U.N. Framework Convention on Climate Change in Copenhagen. Peterson received her B.A. in international studies and environmental affairs from Virginia Tech.

Erin Auel is a Research Assistant for the Energy Policy team at the Center. She previously worked as an intern at the White House Council on Environmental Quality. Auel also interned at the Center, working on domestic energy and environmental policy matters. As a student at Georgetown University, she served as secretary of sustainability and worked to reduce the campus' footprint and establish the university's Office of Sustainability.

Auel graduated with a B.A. in government from Georgetown, with minors in environmental studies and French. She also studied abroad at Sciences Po Lyon in Lyon, France.

Gwynne Taraska is the Associate Director of Energy Policy at the Center, where she works on international and U.S. climate and energy policy. Her recent work has concentrated on multilateral climate negotiations and finance, including the Paris agreement, the Green Climate Fund, and carbon pricing.

Philine Qian is an intern for the Energy Policy team at the Center. She is a student athlete at Clemson University studying international relations, the environment, and natural resources.

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