1 Changing Local Systems to Promote Environmental Health and Justice

When Hurricane Katrina devastated New Orleans in 2005, the nation witnessed environmental injustice in graphic detail. Low-income people—predominantly African Americans—suffered most from this crisis, were underserved by disaster response efforts, and recovered more slowly. Many residents were permanently displaced. As researchers, agencies, and the media searched for explanations, it became clear that historical patterns of land use had put low-income communities and people of color in harm's way (Levitt and Whitaker 2009). Lack of resources limited the ability of marginalized communities to recover. Multiple vulnerabilities including chronic disease, mental health issues, and addiction compounded the effects of the disaster on these populations. According to Bates and Swan (2010, 21), "Katrina swept away the 'traditional belief' that natural disasters are equally devastating on populations and do not discriminate in terms of what is destroyed."

Long-standing policies and practices created the environmental disparities that lay at the root of the hurricane's disproportionate impacts on these communities (Pastor et al. 2006; Levitt and Whitaker 2009; Pardee 2005; Wailoo, Dowd, and O'Neill 2010). Decades of land use and economic development decisions led to concentrated poverty in areas at high risk of flooding. Housing policies failed to provide safe housing, particularly for communities of color. Lack of transportation resources limited the mobility of poorer residents. These and other environmental conditions—such as low-income residents' lack of access to affordable and nutritious foods, preventive health care, and opportunities for physical activity—contributed to the high rates of chronic disease and the poor health status of these same communities, reducing their resilience to environmental disaster.

It is clearly better to address underlying environmental health inequities before a disaster like a hurricane, oil spill, or industrial accident reveals them through devastating impacts on disadvantaged communities. Doing so, however, requires new ways of promoting environmental health at the local level. All over the country, communities, governments, and researchers are working together to change the policies, systems, and environments that drive health inequities. This book explores the promise of these local initiatives by taking an in-depth look at three efforts to address long-standing environmental health issues: childhood lead poisoning, unhealthy built environments, and environmental hazards associated with commercial ports. These case studies all focus on urban environments and communities grappling with environmental health inequities. Environmental health collaborations also arise in rural and suburban settings; however, because the resources, community engagement approaches, and decision processes may be significantly different, this book focuses on comparative analysis of urban initiatives. The case studies explore the evolution of collaborative initiatives to reveal how they operated, what they achieved, and how it may be possible to build on their successes to promote environmental health equity in other communities.

Coalition to Prevent Lead Poisoning—Rochester, NY

The negative health effects of lead—particularly on children—have been known for centuries. Nonetheless, lead was added to gasoline and paint in the United States in the early 1900s, spreading it through homes and roadsides. Since lead was banned in the 1970s, population-wide blood lead levels have plummeted. However, children living in older housing in poor repair continue to be poisoned at alarming rates. In 1999, an elementary school principal in Rochester, New York, discovered that 41 percent of his incoming students had elevated blood lead levels—twenty times the national rate. This striking disparity galvanized diverse stakeholders including researchers, lawyers, health officials, city officials, educators, and child advocates to work together to prevent lead poisoning. The resulting coalition improved health and housing agency coordination, developed a comprehensive communications campaign, and passed a groundbreaking city lead law in 2005 (Korfmacher 2008). By 2012, the number of Rochester

Figure 1.1
Case study locations
(Map credit: Karl Korfmacher)

children with elevated lead levels had decreased over 90 percent, 2.4 times faster than in similar upstate New York cities (Kennedy et al. 2014).

Healthy Duluth—Duluth, MN

Amid national concern over growing rates of obesity, the "healthy communities" movement has highlighted evidence that people living in poorer neighborhoods often lack access to healthy, affordable food and opportunities to be physically active in their daily lives. Community groups and public

health professionals in Duluth, Minnesota, recognized these patterns in their community and hypothesized that they contributed to the higher rates of chronic disease and shorter life expectancies in lower-income areas of the city. Despite being voted "Best Town Ever" by *Outside* magazine, Duluth's poorest neighborhoods had limited access to trails, grocery stores, and safe walking routes (Pearson 2014). Stakeholders began learning about national efforts to promote healthier community environments and undertook several projects to integrate these concepts in local land-use plans. Over time, these efforts expanded to include transportation, brownfield redevelopment, trails, and health systems planning. This work culminated in a 2016 announcement by the mayor of Duluth that health and fairness would be added as core goals of the city's new comprehensive plan (Larson 2016).

THE Impact Project—Southern California

Air pollution was a primary driver of early land use laws separating industrial from residential developments. However, the regional nature of air pollution made local management ineffective. Continued industrialization only worsened air quality. In the United States, air quality has improved dramatically since the passage of the Clean Air Act in 1970, but certain areas continue to exceed health-based standards. Communities living adjacent to major industrial and transportation hubs are particularly at risk. Meanwhile, emerging research shows negative health effects from even low levels of air pollution, particularly for vulnerable populations. Southern California has been an epicenter of air quality concerns for decades. In the early 2000s, expected growth in shipping through the ports of Los Angeles and Long Beach increased community concerns about the cumulative impacts of industrial transportation. THE Impact Project was a collaborative effort by academic and local environmental justice groups to increase consideration of health effects in all decisions related to goods movement in the area (Hricko 2008). In conjunction with ongoing community efforts, THE Impact Project succeeded in attracting media attention to these issues, enhancing community participation in decision processes, and promoting analysis of health equity impacts in decisions about highway, port, and railyard expansions.

These three initiatives highlight the potential for collaborative efforts between communities, technical experts, and decision makers to make

significant improvements in local environmental health problems that disproportionately impact historically marginalized populations. Although these initiatives were primarily local, their successes have national implications. Could these initiatives hold lessons for other communities about how to reduce environmental health inequities? If so, what can be done to better foster and support similar initiatives in other communities?

Answering these questions is crucial both to public health and to environmental protection in the United States. Ballooning health care costs and growing health disparities have brought renewed attention to the social determinants of health—the economic, social, and environmental factors that shape people's ability to live healthy lives. Local collaborations between community, government, and academic stakeholders can change the systems that shape environmental determinants of health and offer promising approaches to reducing health disparities. Lessons learned from these collaborations provide insights into roles, tools, processes, and institutions through which communities can support health-promoting environmental changes.

Local environmental health initiatives also hold potential for reinvigorating public support for environmental management. Although the mission of the U.S. Environmental Protection Agency (EPA) is "to protect human health and the environment," public perception and political rhetoric in recent years has increasingly painted the agency as needlessly blocking economic development to preserve narrow environmental interests. To counter this narrative, former EPA administrator Gina McCarthy embraced "Making a Visible Difference in Communities" as a top theme of the agency's 2014 strategic plan (U.S. EPA 2014a). McCarthy said, "Now that pollution is invisible, people don't actually know what EPA [Environmental Protection Agency] does and [they] don't value it. So, we tend to be more distanced from communities than state-level actions. But we need people to know what we do and why we do it" (McCarthy 2018). She initiated a series of cross-agency projects to make immediate, concrete contributions to local environmental problem-solving. Many of these efforts worked collaboratively with low-income urban communities to address environmental justice concerns (U.S. EPA 2014b). Public communications about the Making a Visible Difference initiative underscored the EPA's work with communities to solve locally identified environmental health problems. Other environmental organizations have also recognized that more

explicitly connecting their work to community health can build awareness of and support for their work (Iannantuono and Eyles 2000).

Environmental health inequities exist because of the historical economic, social, and policy forces that shaped urban development. Our policies to manage environmental and public health impacts rely on technically focused, top-down management institutions separated by issue area with limited public engagement, local flexibility, and coordination. This siloed approach to addressing the environmental and public health legacies of urban development has proved insufficient to reverse unfair burdens on underserved communities. Place-based, collaborative local efforts have potential to form bridges between these silos and promote systems changes to address these intractable problems.

Environmental Health Equity and Justice

Environmental and public health stakeholders are increasingly attentive to the environmental conditions that can contribute to health inequalities in underserved communities. The terms "environmental injustice," "environmental health disparity" and "environmental health inequity," are all used to refer to the disproportionate health impacts of environmental hazards.

Environmental managers operate within legal, policy, and regulatory systems designed to protect human health. Despite this extensive system of health-based environmental laws, however, many communities remain exposed to hazards. Underserved communities are most likely to suffer from these gaps in environmental protection. As former U.S. EPA Administrator Gina McCarthy said, "Environmental protection tends to go from the grassroots up because pollution tends to go down … it hits the most vulnerable the most. There are communities that really are left behind when you do national rulemaking because you can't really get at those issues effectively through regulation … not at the national level. You have to rely on states and you have to rely on local communities" (McCarthy 2018).

Environmental justice is defined by the U.S. EPA as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (U.S. EPA 2018e). The environmental justice movement began with communities recognizing their excessive exposure to environmental hazards and

organizing to reduce these risks. Although these concerns have existed for decades, the environmental justice movement is often traced to citizen protests of 1982 in response to a proposal to dump hazardous waste in Warren County, North Carolina, a community already burdened by multiple waste facilities (Bullard 2008). Similar stories emerged across the county of communities subjected to environmental hazards from past industrial land use or targeted for new polluting facilities (Bryant 1995; Bryant and Mohai 1992; Cole and Foster 2001; Hofrichter 2002). The environmental justice movement grew from connections between these disparate communities that organized around their experiences of unfair environmental burdens as issues of social justice and civil rights (Cole and Foster 2001; Bullard 2008; Novotny 2000). According to Bryant (1995, 9), "Environmental justice is broader in scope than environmental equity. It refers to those cultural norms and values, rules, regulations, behaviors, policies, and decisions to support sustainable communities, where people can interact with confidence that their environmental is safe, nurturing, and productive." Although the term "environmental justice" does not explicitly call out health, the movement has focused on the threats that pollution poses to community health and well-being. Environmental justice efforts have also underscored the unequal distribution of environmental benefits—like parks, urban trees, and safe, walkable streets—that can promote health.

The environmental justice movement emphasizes that current burdens of environmental exposure reflect historical patterns of development and social interaction shaped by racism, economic inequality, and the limited political power of low-income communities and people of color. These dynamics are perpetuated by the power of industry and lack of meaningful community input in public decisions. Environmental justice advocates emphasize that engagement of local communities is therefore essential to developing effective solutions. Thus, "environmental justice" can refer to a movement, an ethical principle, a process of empowerment, or an outcome.

"Health equity" is an ethical principle based on viewing health as a fundamental human right. As Braveman (2014, 7) writes, "Health equity means social justice in health (i.e., no one is denied the possibility to be healthy for belonging to a group that has historically been economically/socially disadvantaged). Health disparities are the metric we use to measure progress toward achieving health equity." By extension, environmental health equity focuses on different groups' access to environmental benefits

and exposure to environmental risks. Environmental health disparities are the variations in health outcomes associated with the differing quality of people's environments. According to the National Institute of Environmental Health Sciences (NIEHS), "Environmental health disparities exist when communities exposed to a combination of poor environmental quality and social inequities have more sickness and disease than wealthier, less polluted communities" (NIEHS 2018b). Concerns about controlling health care costs, preventing disease, and reducing disparities have contributed to health professionals' growing interest in promoting environmental health equity.

This book generally uses the term "environmental health equity" to refer to patterns of environmental exposures or resources and "environmental health disparities" for associated health outcomes. To distinguish the community-based perspective of the environmental justice movement, the term "environmental justice" is generally reserved for organizing, advocacy, and policy efforts that self-identify as such. Environmental justice is also used to emphasize processes with equitable participation, community power-sharing, and a focus on fairness.

According to the NIEHS, "When environmental justice is achieved, environmental health disparities will be reduced" (NIEHS 2018b). This cause has public appeal, as evidenced by the popular press coverage of "death by zip code" maps that show striking disparities in life expectancy between adjacent urban neighborhoods (Raab 2013; Parks 2016). Public health professionals' increasing interest in environmental health equity reflects an emerging consensus that (1) environmental inequities contribute to health disparities; (2) changing these patterns requires changing the policies and systems that shape environmental quality; and (3) doing so requires new connections between community, research, environmental, and health groups.

The environmental justice movement has shown the power of local organizing, partnerships, and collaborations to address environmental health crises. There have been many individual successes—for example, pollution sources being controlled or shut down, hazardous wastes cleaned up, and destructive new developments blocked. As the impacts of Hurricane Katrina showed, it is important to proactively change the underlying systems that create environmental health inequities before crises happen. This book focuses on local environmental health initiatives that aimed to do just that.

Silos, Systems, and Boundary Spanners

The separation of policy by issue-area is often described as "siloed" management (John 1994, 5; Delreux and Happaerts 2016, 66). The image of silos evokes a lack of connection, coordination, or interaction between different areas of environmental practice (United Nations Development Program 2013). Boschken (2009, 1) defined the "silo effect" as "the dysfunctional segregation of policy disciplines often caused by differences in ideology, scientific fragmentation, and professional misunderstanding that limit the ability of one discipline to sufficiently interact with another." As examined in chapter 2, public health and environmental management agencies operate under different policy mandates, regulations, funding streams, and, often, levels of government. Silos separating different aspects of environmental health protection can both create gaps that contribute to environmental inequities and pose barriers to resolving these problems (United Nations Development Program 2013).

Siloed institutions face inherent challenges in managing complex systems. "Systems thinking" means viewing problems as interconnected webs of multiple causes, flows, and feedbacks. Originally developed in the context of ecosystem sustainability, systems thinking has also been applied to computer science, business, economic modeling, and other fields (Meadows 2008; Senge 2013). Public health scholars have increasingly promoted viewing public health as a system, particularly with regard to environmental health (Northridge, Sclar, and Biswas 2003; Trochim et al. 2006; Ashe et al. 2016). According to Ashe and colleagues (2016), "The essence of systems thinking lies in a shift of thinking to see interrelationships rather than linear cause-effect chains, and longer-term processes of change rather than simply snapshots in time. … Through systems thinking, we know that we have to look for the fundamental causes of the problems we are trying to solve."

In this context, "systems thinking" means examining the multiple causes of environmental health problems that lie in different sectors (health or environment), levels of government (federal, state, local), or stakeholder roles (community, academic, government, private sector, etc.). It implies that effective, sustainable solutions often require multilevel changes throughout the management system. Focusing on systems change calls

attention to the key role of "boundary spanning" in solving local environmental health problems (Guston 2001). A fundamental dynamic encountered in environmental health problem-solving is that health and environmental interests are not well integrated in decision-making structures. Involving individuals from various institutions in systems-change efforts requires stakeholders to form bridges between their organizations. Solutions often require individuals within existing agencies, groups, and systems to see their roles differently, act in new ways, and shift their organizations' practices. Doing so may involve stepping outside the boundaries of their normal responsibilities, disciplinary training, and professional experience. Collaboration can contribute to successful systems change, particularly when promising solutions involve multiple organizations, new roles, and diverse targets for action.

When we think about public health as a system, it is clear that poverty—ameliorated or exacerbated by social forces like racism and discrimination—is the underlying driver of health disparities, including those related to environmental determinants. Although environmental and public health professionals may recognize poverty, racism, and social discrimination as root causes, their institutions do not have the tools to directly address these underlying causes (Freudenberg 2004).

However, thinking about environmental health equity as part of a larger system can guide collaborations with other community efforts to reduce poverty. For example, working with anti-poverty efforts can ensure that environmental health activities maximize economic benefits to disadvantaged communities (e.g., workforce development, local hiring) and avoid socioeconomic hardships (e.g., gentrification and displacement). Engaging with local residents, organizations, and community groups can inform efforts that are ethically responsible, suited to local conditions, and culturally appropriate. This engagement can be done in ways that empower communities and build their capacity to self-advocate in multiple issue-areas (Freudenberg, Pastor, and Israel 2011). Highlighting environmental health inequities can justify additional environmental programs, resources, and policies devoted to assisting disproportionately burdened communities. Thus, while environmental efforts are often portrayed—especially at the national level—as threatening economic improvement, community-engaged local initiatives can complement efforts to fight poverty.

Local Environmental Health Initiatives

Many communities have undertaken efforts to address local environmental health inequities. However, most are time-limited, funded for a specific campaign, or focused on a single development project, policy, plan, or practice. This book defines local environmental health initiatives as collaborative problem-solving efforts that aim to make durable changes in systems in order to reduce environmental health disparities. Environmental health inequities persist despite existing laws, regulations, and agencies that aim to protect human health from environmental hazards. Therefore, efforts to address local environmental health inequities are likely to challenge existing systems. Multisector involvement, community engagement, and sustained collaboration are essential.

Initiatives aiming to address environmental health problems must be informed by health, environmental, and community knowledge. Public health data can help highlight the economic and social benefits of preventing disease through environmental change. Accessing public health knowledge does not necessarily require formal involvement by health systems or public health agencies. Informal relationships, internal research capacity, or consultants can also inform the effort. Public health groups may include government agencies, health care institutions, health foundations, or community health organizations. Because of rising concerns about health care costs, the ability to engage public health interests can be a powerful and sustaining source of moral, political, and financial support for environmental health equity efforts.

Local environmental health initiatives must also be able to characterize environmental health risks. In some cases, this means simply analyzing existing data and presenting it in a new light, such as estimating the economic impacts of environmental exposures, showing the geographic distribution of health outcomes, or summarizing the existing research in the context of local conditions. Other initiatives may access experts whose cutting-edge environmental health research helps them demonstrate how existing environmental standards are insufficient to protect health. Some groups conduct "citizen science" to document previously unrecognized hot spots of exposures. Local environmental health initiatives can develop credible, effective solutions if they are able to make use of high-quality, multidisciplinary information.

Meaningful engagement of communities is vital to the success of local environmental health initiatives for several reasons. First, it is ethically essential. As environmental justice advocates have long argued, communities have a right to participate in decisions that affect their health and well-being—especially communities that have not had this opportunity in the past. Second, environmental health inequities manifest at the neighborhood level. Therefore, community knowledge is critical for designing effective solutions. Third, the voice of communities that experience environmental health disparities can be a source of political power to drive systems change. Local environmental health initiatives can provide a vehicle for community influence on policies, systems, and environments that current decision processes lack.

Community engagement may take many forms. In local environmental health initiatives that arise from community-identified concerns, community members may remain active as leaders or partners throughout the collaboration. In other cases, the environmental health issue may not be a high priority for residents, in which case the initiative may work with existing community groups to raise public awareness. Or, residents may be concerned about the issue but lack the capacity to participate directly, in which case the initiative may devote resources to eliciting their input, representing their perspectives, and building their capacity to engage in the future.

Finally, collaborative initiatives must be structured in ways that allow them to influence policies, systems, and environments. Knowledge and strong community engagement contribute to the credibility of an initiative, but they must be coordinated effectively over a period of time to achieve systems change. Participants must understand *why* existing systems are failing to protect environmental health equity and whether local levers (e.g., policies, practices, funding) can be shifted to address these gaps. Stakeholders with experience in policy change may be helpful by identifying promising advocacy strategies. Involving stakeholders from multiple sectors can inform effective boundary-spanning solutions. As well, participants may influence the decisions and behaviors of their home institutions, encouraging them toward ongoing collaboration. Most environmental health problems require action in multiple sectors over a period of years. Therefore, a sustainable collaborative structure is essential for success.

This begs the question: What is a successful local environmental health equity initiative? Collaborative initiatives may have complex goals,

evolving objectives, and diverse modes of action, which makes evaluating the impacts of local environmental health initiatives challenging. As well, their effects may be indirect, long term, or influenced by external factors, further complicating efforts to assess their impacts. This book takes the broad view that a successful local environmental health initiative engages community perspectives, fosters multisectoral collaboration, and contributes to systems changes that are likely to improve environmental health equity over time.

This book refers to local environmental health "initiatives," rather than calling them organizations, collaboratives, partnerships, or coalitions. The term "initiatives" emphasizes the diversity in their structures and highlights that while the individuals involved may consider themselves to be collaborators, their employers, institutions, or agencies may have no formal relationship with or commitment to the efforts. Finally, calling these efforts "initiatives" emphasizes that they are problem-oriented—the collaboration may disband or adopt a different form over time.

A number of national groups and agencies have promoted this type of local collaboration. One example is the Community Outreach and Engagement Cores (COEC) within the NIEHS environmental health research core centers (NIEHS 2018a; O'Fallon et al. 2003).[1] The twenty or so COECs across the country participate in innovative efforts to address community environmental health and justice problems. The NIEHS encourages COECs to leverage their environmental health research resources in support of partnerships that can develop solutions to address identified community needs. Another example is the Robert Wood Johnson Foundation's Active Living by Design program, which has provided funding and technical support for communities to take a data-driven "policy, systems, and environment approach" to creating healthier community environments (Sallis et al. 2006; Active Living by Design 2018). The EPA's Collaborative Problem-Solving Model was developed to guide community-based environmental justice efforts funded through its Environmental Justice Cooperative Agreement Program (U.S. EPA 2018b). Most of these EPA grant-funded partnerships focus on particular projects or facilities, rather than policy processes and systems. Nonetheless, the Collaborative Problem-Solving Model embodies many of the principles of local environmental health initiatives described here. Many other government agencies, foundations and nonprofit organizations have supported similar efforts in their sectors of interest.

Despite some isolated efforts by academics, journalists, and foundations to disseminate these experiences, local environmental health initiatives have not been comparatively analyzed across sectors, geographies, or issue-areas. To fill that gap, this book explores what gives rise to such initiatives, what resources they need to thrive, how effective they are in achieving systems change, and how to foster more effective local environmental health collaborations.

Local environmental health initiatives hold underexplored promise for promoting environmental health equity for several reasons. First, environmental injustices are most often identified at the community level. People living in disproportionately polluted neighborhoods readily perceive the unfairness of being exposed to hazards and having fewer environmental amenities than other communities. Their voices can be a powerful moral, political, and economic driver of systems change. Second, environmental disparities often result from gaps between existing federal and state regulatory systems and require locally informed solutions that are adapted to the unique resources, needs, preferences, and constraints of communities. Third, environmental health problem-solving requires coordination between sectors. Such collaboration is generally easier to initiate and sustain at the local level than between state or federal bureaucracies. Fourth, localities are an important source of innovation and new approaches to intractable problems. Cities have created, tested, and implemented many public health and environmental innovations that have eventually informed broader policy change. Fifth, many of the policies that drive environmental conditions are locally controlled, including land use, transportation, redevelopment, and housing. Finally, particularly in a time of limited budgets and gridlock within state and national legislatures, local initiatives may hold the greatest promise for effective and timely solutions to environmental health challenges.

Introduction to the Case Studies

In each of the three cases presented, local action succeeded in addressing a long-standing issue of environmental injustice: housing-based lead hazards, the built environment, and the environmental impacts of ports. The cases have common features, as well as differences. Comparing the cases provides an opportunity to identify resources, approaches, and strategies that may contribute to successful local health initiatives in other communities. Table 1.1 provides an overview of these case characteristics.

Table 1.1
Case study characteristics

	Coalition to Prevent Lead Poisoning	Healthy Duluth	THE Impact Project
Geographic target of action	Pre-1978 housing; focus on private rental housing in high-risk city neighborhoods	Streets, trails, healthy food access transportation, and land use in Duluth	Regional transportation facilities associated with ports of Los Angeles and Long Beach
Population of area (2010 Census)	City of Rochester, NY: 210,000	City of Duluth, MN: 86,000	Los Angeles County, CA: 10,000,000+
Target population	Children living in high-risk rental housing	All residents; focus on low income and residents of color	Transportation hub-adjacent communities
Environmental issue	Lead in paint and soil around pre-1978 housing	Limited access to active transportation and healthy food sources	Air pollution and other impacts from ships, trains, trucks, and port equipment
Health disparity	Elevated rates of lead poisoning among children living in high-risk neighborhoods	Lower life expectancy in low-income neighborhoods	High rates of asthma, chronic disease, risk of cancer near transportation hubs
Convening/host organization(s)	Community (United Way, Finger Lakes Health Systems Agency)	Multiple community/ government/ conveners (city, county, Healthy Duluth Area Coalition)	Academic (University of Southern California)/community (4 partner groups)
Scope of systems change	*Narrow*: city housing inspection policy (also county and housing authority inspections)	*Medium*: local decisions about roads, public transit, city planning, brownfields, data systems	*Broad*: environmental review of rail, highway, warehouse facilities; local land-use decisions; air quality policies

All three cases were "locally initiated" collaborations, meaning that the problem was identified by local stakeholders. Although all of the cases had significant interaction with national networks, funders, or technical resources, they were not primarily led or supported by a single source of external funding or part of a national program. This dynamic allowed for examination of the role of outside expertise and resources in supporting local initiatives. The process of issue framing, decisions about appropriate structures, objectives, and approaches, and leveraging resources to support the effort were part of the local initiative's work. These decisions may have been influenced by external organizations, but in general they were driven by local stakeholders.

Each initiative was sparked by a growing awareness of an environmental health inequity in the local area. The environmental issues addressed had all been long known to cause health problems, and emerging research had shown even greater reason for concern than was previously thought. Notably, these environmental health problems exist in many other areas, which suggests that the approaches used in these cases might be relevant to other contexts. Finally, there are well-developed policy systems in each of these issue-areas. Thus, rather than starting from scratch, each of these local environmental health initiatives reframed an old problem in a new way, relied primarily on existing data, and focused on shaping how decisions are made within existing policy frameworks.

The three cases differed with respect to institutional structure, decision-making process, and the roles of government, community groups, and academia in the collaboration. For example, THE Impact Project was hosted by a university, whereas the Coalition to Prevent Lead Poisoning was housed at a community health agency, and the Healthy Duluth built environment efforts were convened by a several different government and community groups over time. Although various sectors played different roles in the cases, none was dominated by a single organization. The internal decision-making processes ranged from informal consensus to specific bylaws and voting rules.

These three initiatives were active over at least ten years, and in each case there was substantial documentation that made it possible to describe the initiative's formation, evolution, the sustainability of impacts, and the likely future trajectory. Because many local collaborations are not formal, there is often limited record keeping about their formation, processes, activities, and

outcomes. In these cases, however, a combination of data sources including strategic plans, project reports, funding proposals, news articles, and key informant interviews allowed for in-depth analysis of decision processes, activities, and outcomes over time (see the methodological appendix).

All of the initiatives had significant impacts on local policies, systems, and environments, but the nature of their activities and the scope of systems change varied greatly. Early on, the Coalition to Prevent Lead Poisoning in Rochester was narrowly focused on passage and implementation of a local lead law. Over time, it pursued changes in intergovernmental relationships, promoted community awareness, and facilitated broader partnerships. The Healthy Duluth efforts began by integrating health considerations into specific local area plans and brownfields redevelopment, but eventually expanded to influence the city's comprehensive plan. THE Impact Project had the broadest scope: to increase attention to health in a wide spectrum of transportation, land use, and air quality decisions related to the movement of goods in Southern California. The target of action for these initiatives ranged in scale from the household (Rochester) to neighborhood (Duluth) to regional (Southern California).

Although all are based in urban settings, these cases represent diverse geographies, scales, contexts, and issue-areas. Duluth, Minnesota, the smallest city represented, has a population of around 86,000 and is surrounded by rural areas. Rochester, New York, is a midsize city of around 210,000 within a metropolitan area of around a million people. The goods-movement case focuses on communities living adjacent to transportation hubs across Los Angeles County, which is home to over 10 million people.

In each of these cases, stakeholders responded to perceived environmental health injustices by collaborating to change the systems that allowed these inequities to persist. Each initiative leveraged diverse information sources, community connections, and cross-sector collaboration in response to a place-specific concern about environmental health inequities. They all took a broad, upstream view of what drove the distribution of environmental harms and access to benefits in their communities. Instead of targeting single decisions, developments, or projects, they addressed multiple decision sectors to reduce environmental contributors to health disparities. The phrase "policies, systems, and environmental change" is often used to describe this kind of effort (ChangeLab Solutions 2018b; Public Health Institute 2018). While these collaborations focused on local systems, in

some cases state or federal strategies that impact multiple communities emerged from the local work. They all engaged in a range of education, research, projects, campaigns, and data analyses over time to support their systems change goals. Recognizing that policy systems are dynamic, they also sought to change how, by whom, and by what criteria future decisions are made. Thus, although these groups differed with respect to issue-area, structure, stakeholders, scope, and scale, they all engaged multidisciplinary stakeholders, communities, and collaborative approaches to develop new solutions to long-standing environmental justice issues.

Each of these initiatives reframed an existing issue as one of environmental health inequity. As noted previously, the identified environmental concerns were improving overall but continued to plague historically marginalized communities. These initiatives present a potential model for proactively identifying gaps in existing systems that result in environmental health disparities, filling these gaps, and reducing future health disparities. This potential is why it is important to explore their effectiveness, what contributed to their successes, and how to build on their potential in the future. In addition, it is important to consider whether these approaches—or the solutions they devised—can be replicated in other communities to leverage their impact on promoting environmental health equity throughout the country.

Chapter Overviews

Chapter 2 begins with an overview of how environmental and public health management systems in the United States began as an integrated field but evolved separately to create the current siloed system. The gaps created by these silos contribute to persistent environmental health inequities. Chapter 3 presents burgeoning efforts to rebuild bridges between environment and health to impact the social determinants that contribute to persistent health disparities. These integrative efforts parallel the development of ecosystem management in the 1990s as a way to more effectively manage natural resources. Borrowing from social science research evaluating ecosystem management, chapter 3 presents a Local Environmental Health Initiative Framework as a conceptual guide to analyzing the cases.

The three case studies comprise chapters 4 through 6. Chapter 4 traces the development of an innovative housing-based approach to lead poisoning

prevention in Rochester, New York. Chapter 5 examines a diverse set of local efforts to promote a healthier built environment in Duluth, Minnesota. Chapter 6 analyzes the development and results of THE Impact Project, a systematic effort to consider community health in decisions related to goods movement from the ports of Los Angeles and Long Beach, California.

Chapter 7 analyzes the case studies using the conceptual framework laid out in chapter 3, highlighting how these initiatives reframed environmental problems as issues of health equity, what resources and approaches supported their efforts, and how they changed their communities.

Chapter 8 reflects on how such local environmental health initiatives might be expanded. It examines the initiatives' ability to address gaps in existing systems of environmental management and public health and to create sustainable solutions to problems of environmental justice. This final chapter identifies key themes and opportunities to enhance learning, dissemination, and replication of successful initiatives, and the changes in all sectors that could support future efforts.

This book intends to inform those who are doing—or hope to do—local environmental health and justice work. Community groups, government agencies, academic institutions, funders, and private-sector partners all have important roles. To maximize accessibility to those diverse audiences, each case study provides a brief overview of relevant policy structures and systems. Lessons learned from the three cases may be translated to different sectors, issue-areas, and geographic, political, and social contexts. Environmental professionals may see new ways to gain support for their efforts by connecting them to public health and equity. Public health professionals may glean insights into how they can engage in systems change to address environmental determinants of health. Community groups may identify new approaches they can use to engage government and academic institutions in addressing environmental justice problems. Finally, these initiatives suggest that academic researchers, students, and funders all play critical roles in supporting local problem-solving based on their unique skills and resources. Collaborating effectively, however, requires stakeholders to appreciate each other's diverse incentives, capacities, and constraints. For that reason, this book emphasizes the development of collaborative relationships that often had impacts beyond the scope of the local environmental health initiative.