Rethinking Sustainability Through Environmental Justice Discourse & Knowledge Production: Institutional Environmental Violence Through the Lens of the Flint Water Crisis

by

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ABSTRACT

Sustainability and environmental justice, two fields that developed parallel to each other, are both insufficient to deal with the challenges posed by institutional environmental violence (IEV). This thesis examines the discursive history of sustainability and critiques its focus on science-based technical solutions to large-scale global problems. It further analyzes the gaps in sustainability discourse that can be filled by environmental justice, such as the challenges posed by environmental racism. Despite this, neither field is able to contend with IEV in a meaningful way, which this thesis argues using the case study of the Flint Water Crisis (FWC). The FWC has been addressed as both an issue of sustainability and of environmental justice, yet IEV persists in the community. This is due in part to the narrative of crisis reflected by the FWC and the role that knowledge production plays in that narrative. To fill the gap left by both sustainability and environmental justice, this thesis emphasizes the need for a transformational methodology incorporating knowledge produced by communities and individuals directly impacted by sustainability problems.

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LIST OF ABBREVIATIONS

ACLU	American Civil Liberties Union
BLL	Blood lead level
CPSA	Concerned Pastors for Social Action
DPW	Department of Public Works
DWSD	Detroit Water and Sewerage Department
EM	Emergency Manager
EPA	Environmental Protection Agency
FHA	Federal Housing Administration
FWC	Flint Water Crisis
FWS	Flint Water Study
GM	General Motors
IEV	Institutional Environmental Violence
KWA	Karegnondi Water Authority
LCR	Lead and Copper Rule
MDEQ	Michigan Department of Environmental Quality
NBPOC	Non-Black people of color
NGO	Non-governmental organization
PPB	Parts per billion
SDWA	Safe Drinking Water Act
TJ	Transformative Justice
TTHM	Trihalomethanes
WTP	Water Treatment Plant

INTRODUCTION

"I'm not so sure Flint is the community we want to go out on a limb for. At least without a better understanding of where all that money went." – Debbie Baltazar, chief of EPA Region 5 Water Division's State and Tribal Programs

As the professional and academic fields of sustainability grow more visible and influential through institutional and corporate integration, their emphasis on large-scale global problems and the science-based technical solutions they develop to solve them raises the risks that they are becoming increasingly exclusionary of already marginalized populations through. In doing so, the practical and ideological gap between sustainability and environmental justice widens. This is significant because such a gap may cause sustainability concepts and practices to overlook and/or perpetuate some of the very problems they seek to address. Of particular concern, large-scale global problems cannot be abstracted from local issues of institutional environmental violence (IEV) which frequently underlie the emergence of un-sustainability. I argue herein that the grassroots, systemic approach to institutional environmental violence, grounded in environmental justice, centers as a requisite element in sustainability, and that in bridging this gap using a transformative lens, we can begin to address the immediate and long-term harms caused by IEV.

As the field of sustainability becomes more mainstream, it is at risk of losing sight of the notion that an embodied reality of transformative justice is critical to addressing the large-scale global problems that sustainability tries to address. Science-based solutions, for example, cannot be imagined as totally independent of existing systems of social power, knowledge and justice. To pretend otherwise is to concede to institutionalized social injustices that could be at the root of sustainability problems to begin with. Perhaps nowhere is this better illustrated than in the case of the Flint Water

Crisis, a public health and institutional violence emergency ghost-written by sustainability problems such as polluted water, infrastructural instability, and weak environmental regulations. Neither sustainability nor environmental justice are equipped with the discourse or praxis to address the harm caused by IEV in Flint. Compounding this is the aforementioned emphasis on global problems and science-based technical solutions, which implies the use of certain forms of knowledge production that fit within the rigid standards enforced by positivist science. If academic training in sustainability reinforces this bias, then the field may become more rigid, narrower, more scientistic, and more corporate. By looking at the case of Flint, it is clear that the optics of sustainability were and are, ironically, too narrow to "see" the problem in its multiple dimensions and its language tends to be too restrictive to call for or design solutions to implement radical transformative change.

If this is true at a local scale, like in Flint, there is no way that sustainability will be able to meaningfully address the wicked, global-scale problems like climate change. Herein, I contend that in addition to glaring ethical concerns, environmental justice—and indeed evolving principles of justice generally—must be incorporated into the field of sustainability if we have any hope of meaningfully addressing both local and large-scale global problems. Furthermore, this must include a lens of institutional transformation that builds off of existing transformational justice literature and indeed social justice movements themselves. In order to illustrate this, I will first introduce and define the concept of IEV.

UNSUSTAINABILITY AND INSTITUTIONAL ENVIRONMENTAL VIOLENCE

Environmental injustice and unsustainability are constitutive of violence. What this means is that environmental injustice and unsustainability as physical conditions are directly responsible for the physical, mental, and emotional harm experienced by people and communities impacted by them. Solnit (2014) illustrates this through the example of top-down and bottom-up violence attributed to climate change, arguing that climate violence is used almost exclusively to refer to bottom-up violence committed by individuals and communities affected by climate change. This is a more traditional kind of violence inflicted "by hands, by knife, by club, or maybe modern hands-on violence, by gun or by car" (Rebecca Solnit, 2014). However, this is not the only kind of violence experienced by communities affected by environmental degradation. Solnit (2014) asserts:

> If you're tremendously wealthy, you can practice industrial-scale violence without any manual labor on your own part. You can, say, build a sweatshop factory that will collapse in Bangladesh and kill more people than any hands-on mass murderer ever did, or you can calculate risk and benefit about putting poisons or unsafe machines into the world, as manufacturers do every day. (Rebecca Solnit, 2014)

This top-down form of violence, what I call *institutional environmental violence* (IEV), refers to the direct physical, mental, and emotional harm to members of a community caused by built or natural environmental degradation or lack of access to built or natural environmental services. These are directly or indirectly caused by institutional actions, policies, or decisions that enable industrial-scale violence to occur. In this context, the term "institution" refers to state structures such as the federal, state, and local government, academic organizations such as schools, and social/economic structures such as capitalism. The Flint water crisis (FWC) is an ongoing act of IEV.

Alone, neither the current practices associated with sustainability solutions nor environmental justice can sufficiently address IEV—sustainability for its narrow focus and environmental justice for its lack of institutional power. What we need is to center the knowledge of people directly impacted by IEV in order to address the direct harms while likewise tackling the institutional factors that cause and contribute to IEV (Agyeman, 2008; Agyeman, Bullard, & Evans, 2002; Agyeman & Evans, 2004; Bullard, 1993; GenerationFIVE, 2017; Kershnar et al., 2007). In this thesis, I evaluate the case of lead poisoning through the water supply of Flint, Michigan, as a cautionary tale that calls for a centering of knowledge production not typically valued by fields like sustainability. I do this by (1) examining the discursive histories and limitations of sustainability and environmental justice; (2) retelling the narrative of violence in the FWC; and (3) analyzing the role of knowledge production in sustainability broadly and the FWC specifically.

CHAPTER 2: THE LIMITS OF SUSTAINABILITY AND ENVIRONMENTAL JUSTICE

In this chapter, I briefly outline the discursive histories of sustainability and environmental justice. I then go on to highlight the role that racism plays in instances of environmental injustice, asserting that race in the United States is the *master category* of oppression in instances of IEV. In this brief history, it is apparent that the fields of sustainability and environmental justice are not incompatible, but they do face significant challenges in communicating with each other. This is due, in part, to the colorblind approach that sustainability tends to take in both theory and praxis as well as the way that sustainability defines problems. In defining problems, sustainability tends to rely on top-down, power-over framing techniques that reinforce existing hegemonic structures and limit the discursive scope of sustainability. I conclude this chapter by asserting that if the field of sustainability wishes to address the so-called "wicked" problems (or problems that are unduly difficult to address) posed by unsustainability, it must center the theories of environmental justice.

SUSTAINABILITY

Sustainability as an academic and professional field has seen unprecedented growth since the turn of the 21st century (Clark & Dickson, 2003; Hart & Bell, 2013; Kates, Clark, Corell, Hall, & Jaeger, 2001; Komiyama & Takeuchi, 2006; Miller et al., 2014a; Yarime, Takeda, & Kajikawa, 2010). This is clear in the widely publicized adoption of sustainable policies and practices by major corporations as well as the large-scale funding of institutions teaching sustainability by private donors like the Walton family or the Koch brothers, multi-billion-dollar companies infamous for their global-

scale pollution and depletion of natural resources. Despite the steadfast refusal to acknowledge sustainability threats (like climate change) by the U.S. government, sustainability has risen to center stage and remains at the forefront of American collective consciousness. In this collective consciousness, sustainability is intrinsically linked with climate change, a large-scale problem for current and future generations that threatens the Earth and its inhabitants writ large. This idea of inter- and intra-generational justice as well as the emphasis on large-scale, global problems is central to the discourse of sustainability (Agyeman, 2005; Dobson, 1999; World Commission on Environment and Development, 1987). Because of the sheer magnitude of the problems tackled by sustainability, the field employs a largely *top-down* global or national lens, looking to "international processes and committees, government structures, think-tanks and international [non-governmental organization (NGO)] networks" (Agyeman et al., 2002, p. 88). Environmental justice, on the other hand, is typically understood as a grassroots or *bottom-up* response composed of expert-defined "stakeholders" with interests in major top-down decisions like siting or policy (Agyeman et al., 2002, p. 88).

Sustainability is historically thought to have grown out of the 1987 Report of the World Commission on Environment and Development: Our Common Future, commonly referred to as the Brundtland Report, which defined sustainable *development* as **"**development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). More recently, the field of sustainability *science* has grown in an attempt to convey the urgency of the problems illustrated in the Brundtland Report and develop systematic, evidence-based, effective solutions based on the scientific evidence

(Tarlock, 2002). The development of sustainability science as a field worthy of pursuit and study was largely cemented by Kates et al. (2001), wherein they argue the need for an understanding of the "fundamental character of interactions between nature and society" (Kates et al., 2001, p. 641). Kates et al. further assert that "such an understanding must encompass the interaction of global processes with the ecological and social characteristics of particular places and sectors," situating the field as necessarily inter- and trans-disciplinary (Kates et al., 2001, p. 641). Integral to the development of sustainability science was the focus on tangible solutions to sustainability problems, which necessitated the inclusion of and focus on "different ways of knowing and learning" that sought to enhance the scientific process through the inclusion of a variety of voices and disciplines (Kates et al., 2001, p. 641). In particular, Kates et al. contend that "in a world put at risk by the unintended consequences of scientific progress, participatory procedures involving scientists, stakeholders, advocates, active citizens, and users of knowledge are critically needed" (Kates et al., 2001, p. 641).

This emphasis on integration and social participation in scientific problem-solving has been echoed by sustainability scientists like Yarime et al. (2012), who argue that the complexity of sustainability *problems* demands the integration of "knowledge and information from various academic disciplines, including natural sciences, engineering, social sciences, and humanities" (Yarime et al., 2012, p. 102). Wiek et al. (2012) similarly contend that it is necessary for scientists to "engage with a broad range of stakeholders from other domains of society, not only to improve the collective understanding of coupled systems […] but also to develop joint and coordinated strategies for how to solve sustainability problems" (Wiek, Farioli, Fukushi, & Yarime, 2012, p. 6). The significance

of practical application of *solutions* is central to the field of sustainability science, coming out of an understanding that sustainability *problems* are inherently urgent and therefore work done in the field must precipitate or involve the application of a tangible *solution*. Consequently, sustainability science is innovative and radical in the world of academia (Benessia et al., 2012; Carlson, 2017; Miller et al., 2014b; Yarime et al., 2012). That said, the field grew out of academic spaces—specifically, the field of sustainable development, which cultivated a largely positivist scientific tradition that regards the scientific process as a producer of objective truths not influenced by bias (Kates et al., 2001, p. 641). Sustainable development specifically (through large-scale neocolonial projects like the World Bank and the International Monetary Fund (Carrasco, 2002; Durokifa & Ijeoma, 2018; Käkönen, 1975; Mawuko-Yevugah, 2010)) and academia broadly are reliant on hegemonic structures of Western colonial white supremacy and cisheteropatriarchy that define Western culture writ large through the ongoing structure of settler colonialism (Dei, 2016; Fanon, 1963; Glenn, 2015). These hegemonic structures value certain—white, cisgender (a person whose gender identity matches the gender they were assigned at birth), male—bodies and types of knowledge typically produced by those bodies over marginalized groups and individuals. These structures, overwhelmingly present in sustainable development projects of large-scale development banks, are likewise present in sustainability science (Carrasco, 2002; Durokifa & Ijeoma, 2018; Käkönen, 1975; Mawuko-Yevugah, 2010). For the purposes of this paper, both sustainability science and sustainable development will be referred to as simply *sustainability*. I also feel the need to specify that when discussing sustainability and environmental justice, I am specifically discussing the narrative realities of the fields—how they appear in the collective

consciousness of people outside of the fields. This is significant because there are a number of significant contributors to both fields that are actively addressing the critiques I raise in this thesis (Agyeman et al., 2002; Agyeman & Evans, 2003; Alkon & Agyeman, 2011; Braz & Gilmore, 2006; Bullard, 1993; Checker, 2011; Gonzalez, 2015; Haas et al., 2018; Mares & Peña, 2011).

ENVIRONMENTAL JUSTICE AND ENVIRONMENTAL RACISM

Environmental justice in the United States has historically focused largely on the distribution of risk of environmental harm (Schlosberg, 2013). Furthermore, "the roots of contemporary environmental injustice lie in colonialism," which means that the distribution of risk largely impacts already marginalized communities (Gonzalez, 2015, p. 159). Despite this, a more mainstream conception of environmental justice centers the role of white mothers in a standard narrative. This is perhaps most clear in the case of Love Canal, wherein

> Hooker Chemical dumped large amounts of some very nasty stuff in a hole in Niagara Falls, New York, and then covered it up—literally and figuratively—before selling the property to the local school board for $1. In the 1970s, large amounts of rainfall caused some of the buried waste to leak out of its containers, flow to the surface, and contaminate homes in the area. (Blum, 2008, p. 1)

Upon discovering this toxic history, residents of Love Canal realized that the poor health they were experiencing was likely caused by this contamination. Lois Gibbs, a white mother and homeowner, spearheaded the effort "to get the entire neighborhood relocated" (Blum, 2008, p. 1). She had little help from the government, who refused to act without absolute *scientific* proof of causation:

> The relevant governmental body, the New York State Department of Health, failed to find any relationship between proximity to Love Canal and higher incidence of disease, implying, accordingly, that there was no evidence of a negative health effect from the canal. In response, residents conducted health surveys indicating the incidents of cancer and other diseases in the community. With the help of

> Beverly Paigen, a professional cancer researcher, local activists overlaid their results onto a map. (Edelstein, 2000, p. 126)

The case of Love Canal is critical to understanding environmental justice in a number of ways—in particular, it highlights the structural racism that shapes American government and society. While the popular narrative of Love Canal focused on a white mother, Lois Gibbs, the truth was that "gender, race, and class played a vital role in how the residents of Love Canal experienced and dealt with the environmental crisis" (Blum, 2008, p. 2). Furthermore, this narrative obscures the role that Black activists who played a central role in exposing the toxic history of the area (Blum, 2008). Racism is present in every instance of environmental injustice; this is not to say that the only people who experience environmental injustice are people of color (POC), but rather that the social construction of race contributes to the distribution of risk and harm. Pulido (2017) draws attention to this, asserting that it stems from a mis-conceptualization of the problem of environmental justice, "including not giving sufficient weight to the ballast of past racial violence, and assuming the state to be a neutral force, when, in fact, it is actively sanctioning and/or producing racial violence in the form of death and degraded bodies and environments" (Pulido, 2017, pp. 524–525).

Omi & Winant (2015) regard race as the "*master category* of oppression and resistance in the United States," meaning that "in the United States race has served as a *template* for both difference and inequality" (Omi & Winant, 2015, p. 245). In the context of environmental justice this means that race is always a factor, which necessitates the application of an anti-racist lens. It is important here to recognize the great human sacrifice that "created the United States and all the Americas: the twin genocides of conquest and slavery," as this history shapes our society and our spatial reality to this day

(Omi & Winant, 2015, p. 245). This is clear in the distribution of risk and harm, which disproportionately impacts communities of color. This assertion has since been backed up by countless scholars and activists who argue that environmental justice cannot be separated from race; while environmental injustice impacts individuals and communities across lines drawn by race, class, and gender, race persists as the *master category of oppression* in instances of environmental injustice (Blum, 2008; Bullard, 1993; Ford & Airhihenbuwa, 2010; Macias, 2016; Massey, 2004; Roby, 2016; Schulz et al., 2016)

In recognizing this, I turn to the disproportionate burden of environmental *racism* that is placed on Black Americans, which is compounded by a lack of access to "social, economic, and political resources with which to mitigate the adverse health effects of" environmental hazards (Schulz et al., 2016, p. 287). Schulz et al. (2016) reference the Detroit metropolitan area in particular, contending that environmental hazards and associated health risks "disproportionately affect the health of communities of color, those with heightened economic vulnerability, and those with heightened age-related susceptibility" (Schulz et al., 2016, p. 299). While it is easy to attribute this increased risk to class and income disparities related to physical geography, it is likewise important to recognize the role that race plays in these issues, particularly when looking for ways to "solve" them:

> While both class and race determine the distribution of environmental hazards, racial minorities are more likely to be exposed to environmental threats than are whites of the same social class. Race is a powerful predictor of many environmental hazards, including the distribution of air pollution, the location of municipal solid waste facilities, the location of abandoned toxic waste sites, toxic fish consumption, and lead poisoning in children. (Bullard, 1993, pp. 319–320)

Environmental racism thus becomes a critical lens in understanding IEV in particular communities and how justice is (not) addressed, serving as an extension of the existing

state of racism and inequality that shapes the reality of the United States settler colony (Dunbar-Ortiz, 2014; Fanon, 1963; Omi & Winant, 2015).

THE PROMISE AND LIMITS OF "JUST" SUSTAINABILITY

Sustainability and environmental justice are not incompatible, but the synergies between them remain insufficiently acknowledged and developed. The two discourses have largely "developed in parallel and, although they have touched, there has been insufficient interpenetration of values, framings, ideas and understandings" (Agyeman et al., 2002, p. 88).

This is clear in the discursive divide between the two disciplines, wherein scholars from both fields tend to argue that the other is too limiting. In discussing sustainable development, Salkin et al. (2012) contend:

> Because sustainable development is a form of development, it automatically includes the entire sphere of economic and social development, raising basic questions about acceptable forms of economic development anywhere. While many environmental justice issues are framed in terms of impacts of a particular project or activity […], sustainable development raises basis systemic questions. (Dernbach, Salkin, & Brown, 2012, p. 18)

On the other hand, Agyeman (2008) asserts that in terms of the United States, "the environmental sustainability movement does not have an analysis or theory of change with strategies for dealing with […] issues" of justice and equity, leaving it unable to transform the systems it claims to critique like the state (Agyeman, 2008, p. 751). Agyeman (2008) attributes this, in part, to the growing acceptance of sustainability by corporate and government structures—the very institutions that *both* discourses argue must be radically transformed in order to secure a sustainable/just future—and the stratification of privilege between the two discourses. Agyeman (2008) asserts, "there is abundant research that characterizes the environmental sustainability movement as

largely white, educated and middle class while the environmental justice movement is largely low-income, people of colour driven" (Agyeman, 2008, pp. 752–753). Pulido (2017) asserts that this must be combatted by rethinking the state as "a site of opposition" that is antithetical to the goals of environmental justice (Pulido, 2017, p. 525). Furthermore, while there is a large body of literature lobbying for the inclusion of environmental justice—or, at the bare minimum, *justice*—in sustainability discourse and strategy from the environmental justice side, there is very little recognition as yet from the sustainability side about the value of including justice. The exception to this might be sustainable development, a field steeped in such controversy as to virtually require the integration of social justice praxis (Alkon & Agyeman, 2011; Farley, 2013; Kauffman, 2009).

In many ways, sustainability as a field is colorblind, subscribing to the hegemonic discourse that in their quest to "save the world," "they are saving it for everyone *equally*, which somehow absolves them from wider discussions of equity and justice" (Agyeman, 2008, p. 751). Colorblindness, a form of racism, ignores the role that race plays in instances of structural violence and discrimination, instead "placing blame for the conditions of inequity on those who have been the targets of systemic injustice" (Wise, 2010, p. 19). Colorblind approaches to sustainability might include financial incentives to reduce gasoline use, such as a gas tax applied equally to everyone, that would reduce the output of greenhouse gasses but place the burden on those who can least afford it. While race is not overtly present in any of these approaches, the long history of Black exclusion from wealth accumulation means that they would all place a disproportionate burden on Black and non-Black communities of color (Feagin, 1999; Ferguson, 2004; Ford &

Airhihenbuwa, 2010; Gallagher, 2003; Lipsitz, 2009). Furthermore, the root causes of sustainability problems are likely to be misidentified if approached through a lens of colorblindness. Without examining the historical contexts and traumas that shape the sustainability *problem*, any *solution* is necessarily going to strengthen structures of inequity—structures that are antithetical to the goals of sustainability.

In their seminal essay decrying the *Death of Environmentalism*, Nordhaus & Shellenberger (2005) lambast the environmental sustainability movement for its weakness on social justice and narrow vision of technocratic solutions-based thinking:

> Nearly all of the more than two-dozen environmentalists we interviewed underscored that climate change demands that we remake the global economy in ways that will transform the lives of six billion people. All recognize that it's an undertaking of monumental size and complexity. And all acknowledged that we must reduce emissions by up to 70 percent as soon as possible. But in their public campaigns, not one of America's environmental leaders is articulating a vision of the future commensurate with the magnitude of the crisis. Instead they are promoting technical policy fixes like pollution controls and higher vehicle mileage standards — proposals that provide neither the popular inspiration nor the political alliances the community needs to deal with the problem. (Nordhaus & Shellenberger, 2005)

Part of this, they argue, comes from the way that environmental sustainability defines problems:

> Why, for instance, is a *human*-made phenomenon like global warming — which may kill hundreds of millions of *human beings* over the next century — considered 'environmental'? Why are poverty and war not considered environmental problems while global warming is? What are the implications of framing global warming as an *environmental* problem — and handing off the responsibility for dealing with it to 'environmentalists'? (Nordhaus & Shellenberger, 2005)

Taking this critique even further, I contend that the problem lies not only in *how* a problem is defined, but also *who* is defining it. Traditionally, *problems* are defined by "experts" within traditional academic models such as scientists or researchers. This is significant in that "the way a problem is framed determines the possible policies that can

be crafted to offer a solution" as well as the direction that research takes, which necessitates funding (Ascher, 2007, p. 144; Farley, 2013, p. 8). Likewise, when problems are defined by experts identified by academia rather than experts identified by impacted individuals and communities, those definitions thus "imply a set of underlying assumptions that confine or constrain our ability to raise questions and think about possible alternatives" (Roby, 2016, p. 4).

Howieson et al. (2019) argue that this sort of problem framing draws on traditional policy discourse that relies on a "neoliberal leadership paradigm" that operates using "power-over" (Howieson, Burnes, & Summers, 2019). This is clear in the field of sustainable development, wherein *sustainability* is defined by powerful financial and political organizations such as the United Nations (UN), International Monetary Fund (IMF), and World Bank (WB). Therefore, "the way sustainable development is discussed also frames the problems sustainable development is meant to address which limits the possible policy alternatives that might be used" (Farley, 2013, p. 8). Sustainability science is likewise exclusionary in that in order to be considered a *problem*, "a situation needs to get recognized and judged to be averse, in terms of sustainability, on justifiable grounds, and by a group of legitimate stakeholders" (Wiek, 2015, p. 16). The idea of *legitimate stakeholders* here implies a certain type of knowledge found in hegemonic structures of positivist science. Sustainability prides itself on pragmatism and innovation, yet its reliance on traditional definitions of problems combined with its increasing integration with institutional and corporate interests keeps it firmly rooted hegemonic Western structures of knowledge and action. In practice, this strengthens Howieson et al.'s (2019) neoliberal leadership paradigm, a paradigm

> that prioritises the pursuit of profit through free markets, private enterprise, deregulation and a reduction in state power, taxation and expenditure. Its rationale is that society works best when people, organisations and governments operate on a free market basis, and leaders are motivated by the pursuit of profit, which is seen not only as a common good but as the prime and possibly the only common good. (Howieson et al., 2019, p. 1)

Sustainable problems cannot be meaningfully addressed under this type of hegemonic leadership, as the type of radical transformational change that is required does not—and cannot—conform to the values espoused by the neoliberal free market.

The problems that sustainability and environmental justice are trying to address are what Batie (2008) refers to as "wicked problems," which tend to be "dynamically complex, ill-structured, public problems" (Batie, 2008, p. 1176). The wickedness of these problems

> Stems not only from their biophysical complexity but also from multiple stakeholders' perceptions of them and of potential trade-offs associated with problem solving. Identification of solutions becomes as much a social and political problem as it is a scientific endeavor. (Batie, 2008, p. 1176)

Batie (2008) goes on to assert that wicked problems cannot be addressed without "meaningful engagement of stakeholders in decision making that propels knowledge into action" (Batie, 2008, p. 1181). While the term "stakeholders" is too derivative to apply to individuals impacted by IEV, the idea of meaningful collaboration that underpins Batie's (2008) assertion stands. In terms of the wicked problems of unsustainability and environmental injustice, it follows that they

cannot be solved without inclusion, stakeholder participation, and the serious involvement of non-experts in defining problems and developing solution options. To seriously embrace a commitment to inclusion requires admitting that solutions may sometimes require a radical transformative justice approach that calls into question the very institutions that brought about those problems. While there is an abundance of

sustainability literature that espouses the importance of transformative approaches, they lack the focus of *justice,* leaving them unable to comprehensively address IEV (Wamsler et al., 2018; Wiek, Ness, Schweizer-Ries, Brand, & Farioli, 2012; Wiek, Withycombe, & Redman, 2011). In many ways, environmental justice already employs many of the transformative justice tools needed to combat IEV. In this thesis, I contend that if sustainability truly wants to address climate change and other major environmental problems, environmental justice *must* be given a central voice in sustainability discourse using a lens of institutional transformation.

In this chapter, I provided a brief overview of the discursive histories of sustainability and environmental justice. Following this, I highlighted the colorblind approach that sustainability tends to take and asserted that this exacerbates existing environmental racism, a concern that arises from the lack of discursive communication between the two fields. In the following chapter, I will examine the role of IEV in the case of the FWC, asserting that neither sustainability nor environmental justice alone were or are sufficient in addressing the immediate and long-term harm caused by the FWC.

CHAPTER 3: THE FLINT WATER CRISIS: A CASE STUDY IN IEV

In this chapter, I retell the story of the FWC in a chronological narrative, focusing first on the popular narrative as told by government officials and media outlets at the time of the crisis. This narrative is critical to the understanding of environmental justice discourse because of its similar structure to other instances of environmental injustice and IEV. In April 2013, the City of Flint, under the direction of an Emergency Manager (EM) appointed by Governor Rick Snyder, joined the Karegnondi Water Authority (KWA), which would bring water from Lake Huron to Flint and be processed through the Flint Water Treatment Plant (WTP) before distribution to the city's nearly 100,000 residents. This decision, which has since been widely critiqued by local organizations such as Flint Rising, was made ostensibly to save the City and its residents money and was largely seen as a response to the Detroit Water and Sewerage Department's (DWSD) consistent rate increases (Hanna-Attisha, 2017; Moore, 2018). In the interim, Flint had planned to continue purchasing water from the DWSD, the city's water supply since 1967, but elected to use treated Flint River water instead after negotiations with DWSD broke down in late 2013. In April 2014, Mayor Dayne Walling pushed a button in the WTP that switched the water source from DWSD to the Flint River and subsequently ignited one of the worst environmental crises in the nation's history.

Almost immediately following the initial switch, residents began alerting local authorities of their concerns with the water quality, citing brown water, odd smells, and a variety of health concerns including skin inflammation and rashes in children (Zahran, McElmurry, & Sadler, 2017, p. 160). This is where the common narrative of the FWC starts to center on one resident's concerns in particular—those of LeeAnne Walters, a

white mother of three young boys. On January 21, a now-famous photo of Walters was taken as she held up bottles of brown water from her tap in from of EM Jerry Ambrose (Flint Water Advisory Task Force, 2016, p. 92):

Figure 1. *LeeAnne Walters showing water samples to EM Jerry Ambrose on January 21, 2015*

Shortly after this confrontation, Walters called the Environmental Protection Agency (EPA) and subsequently the Department of Public Works (DPW) in to test her water, and "WOW!!! Did [they] find LEAD! 104 parts per billion" (ppb), nearly 10 times the federal action level of 15 ppb (Flint Water Advisory Task Force, 2016, p. 93).

Despite the high lead level at Walter's residence, the Michigan Department of Environmental Quality (MDEQ) maintained that the water was safe to drink, blaming Walters' high lead level on lead plumbing inside her home (all of which was, in fact, PVC) and claiming that it was an outlier and did not impact the city's compliance with the national Lead and Copper Rule (LCR). On April 27, 2015 Miguel Del Toral from the EPA visited Walters' home to investigate the high lead levels and gave Walters the contact

information for Professor Marc Edwards, who worked to prove that lead was present in Washington D.C.'s municipal water system. Two key things came out of this meeting: (1) Miguel Del Toral's Draft Memo and (2) the Flint Water Study (FWS). On June 24, Del Toral sent his "Interim Report: High Lead Levels in Flint, Michigan" to his supervisor at the EPA, outlining a number of concerns regarding lead in Flint's water including the lack of corrosion control treatment at the WTP (Flint Water Advisory Task Force, 2016, p. 97). This report takes on the air of civil disobedience in the common narrative today—a "rogue employee" coming out to tell the residents of Flint that there was lead in the water while the rest of the EPA remained silent—particularly after he shared the memo with LeeAnne Walters, who leaked the memo to the press (Flint Water Advisory Task Force, 2016, pp. 97, 103). In reality, Del Toral may not have known that Walters' would share the memo with the press, and his decision to share his findings with a directly impacted party were not unusual for EPA employees.

Around the same time, Dr. Edwards established the FWS with a team of graduate students from Virginia Tech. The FWS took samples from homes in Flint using a procedure that notably differed from what the MDEQ was using and sent them back to the Virginia Tech lab for analysis. Significantly, the FWS published all of their results online and called residents to inform them of their home's lead levels, which brought a great deal of local attention to the high lead levels being found (Edwards, Roy, Rhoads, Parks, & Mantha, 2015). At this point, no action had been taken to mitigate the problem of lead leaching into Flint water by the state, county, or local governments, although quite a lot of action had been taken to cover it up, including allegedly changing blood lead data to reflect lower lead levels (Fonger, 2018; Moore, 2018). The community was justifiably

enraged by the time Dr. Mona Hanna-Attisha, a pediatrician in Flint, released her study on blood lead levels (BLL) in children before and after the water switch on April 24, 2014. Dr. Hanna-Attisha's data showed a correlation between the switch and high BLLs, which she announced at a press conference immediately after tests were completed, bypassing the peer-review process in favor of disseminating the information, arguing that the situation was too urgent to wait for peer review (Hanna-Attisha, 2017). After several days of trying to discredit Dr. Hanna-Attisha and poke holes in her data and methods, the city finally issued a public health advisory admitting that there was lead in Flint drinking water. A month later, Governor Rick Snyder and President Barack Obama declared States of Emergency just days apart.

In terms of the common narrative, this is where the story ends. The city switched back to DWSD water, elected a new mayor, and went on with their lives. The residents of Flint were saved by scientists, doctors, and a single vocal resident speaking out against a corrupt government. The FWC has not "ended," nor has it been solved; in the following sections, I will outline parts of this story that have been left out—sometimes intentionally—and offer analysis of the FWC as an ongoing instance of IEV before detailing the significance of the FWC in sustainability and environmental justice discourse, and how it might serve as a test case for a hybrid concept of just sustainability.

INSTITUTIONAL ENVIRONMENTAL VIOLENCE IN FLINT

The people of Flint have been poisoned by their government. In a scathing Facebook post, Flint Councilmember Wantwaz Davis (a mayoral candidate at the time) wrote:

> It has become apparent to me that the emergency manager and Governor Rick Snyder is creating an obvious genocide against the residents in Flint, Michigan,

> who are forced to drink the contaminated, unhealthy water, that is going to commit an imminent danger to the lives of those who have a compromised immune system, and infants who biologically doesn't have a fully developed immune system. […] This is a picture of *[sic]* reminder that in the past summer, I conducted 4 protest against the contaminated water and high water bills, I was telling people about the unhealthy water, before any notices came out to the public, attempting to keep these issues at the forefront, as mayor I will continue to fight even harder, these issues will not die until justice is brought to the people and someone is charged for this imminent genocide. (R. Fonger, personal correspondence, April 6, 2015)

Activists in Flint tend to refer to the FWC in much the same way—as an act of violence; in particular, an act of violence against Black Americans:

> @BlckGirlsMatter
> #TamirRice's murder and the deadly effects of the #Flint #lead water are ALL connected as gratuitous violence against Black communities
> 5:08 PM – 18 Jan 2016 (BlckGirlsMatter, 2016)

In a study on youth perception of critical race theory in the FWC, a number of young residents likewise echoed this sentiment:

> Speaker 66 [forum 4.2, male, Black, 16, grade 11]: I think that's [the official narrative] all a lie. I think it's genocide. (Muhammad et al., 2018, p. 244)

> Speaker 68 [forum 4.2, male, multi-racial, 15, grade 9]: I believe like the water got something to do with the killings too. They're not doing nothing about all the murders that happen… (Muhammad et al., 2018, p. 244)

It is important to note that I am not the first one to refer to the FWC as an act of violence; this framing comes from those affected by the crisis; those experiencing that violence firsthand. It is also important to note that this framing is notably absent from the common narrative of the FWC, as are the many activists who protested this violence as early as May 2014, when residents started filing complaints with the City over water quality and high water prices (Flint Water Advisory Task Force, 2016). In September 2014, Flint resident Jerry Lynch wrote:

> I just read in The Journal that 16 million gallons of raw sewage was dumped in the Flint River. What I want to ask is, just how safe is our drinking water? They

> say don't make body contact with the water. Where does this sewage go? Residents on the west side of Flint had to boil water for days because of bad water. After all of this, the City of Flint says the water is safe to drink once the boil water advisory is lifted. Remember, city officials speak with forked tongues. The earth is covered by 71 percent water and in Flint there's none safe to drink. Get real, City of Flint. Oh, and by the way, Flint residents, don't forget to pay your $150-a-month bill for this great-tasting water. (Lynch, 2014)

The bulk of the narrative of the FWC centers on lead in the water, although this was just one element of the violence experience in Flint because of the water switch. That said, lead is extremely dangerous, and the effects of lead poisoning are irreversible. In children, lead exposure "may result in anemia, kidney damage, colic, muscle weakness, and brain damage. Exposure to the fetus during pregnancy can result in fetal death, premature delivery, low birth weight, and lower intelligence in later childhood" (Butler, Scammell, & Benson, 2016, p. 93). While there are a number of very serious physical health concerns with lead poisoning that should not be discounted, I will focus on the mental health concerns. Lead exposure specifically targets a number of cognitive functions, including "attention and executive functions, visual-motor integration, fine and gross motor skills, verbal skills, and learning" (Healy & Bernstein, 2016, p. 168). Because of this, lead exposure has also been linked to learning disabilities, poor academic performance, and lower intellectual functioning (Healy & Bernstein, 2016). This can lead to higher rates of delinquent behavior and subsequently higher rates of interaction with the criminal justice system and prison industrial complex (Corburn, 2005; Denno, 1993; Healy & Bernstein, 2016; Needleman, McFarland, Ness, Fienberg, & Tobin, 2002; Nevin, 2000).

Furthermore, survivors of the FWC are also subjected to the mental health concerns associated with a natural or man-made disaster, such as "post-traumatic stress and fear, anxiety, and depression" (Healy & Bernstein, 2016, p. 167). These harms

experienced by the residents of Flint are the direct consequences of IEV and are largely distorted by the common narrative of the FWC. What this means is that the persistent harms of lead poisoning and governmental neglect as well as the underlying conditions informed by (environmental) racism persist within the City. Before discussing the significance of this common narrative in these persistent harms, however, it is critical to understand the role that sustainability and environmental justice played and are playing in the FWC.

SUSTAINABILITY IN FLINT

The FWC was informed by a number of problems central to sustainability, as defined by Brundtland and prevailing definitions thereafter, such as water pollution, infrastructural instability, and weak environmental regulations. When the City of Flint initially switched water sources from DWSD to the Flint River, there was pushback from residents and city employees because of the long history of pollution of the river stemming back to the 1930s,

> when the area's booming auto industry manufactured batteries, paints, lacquers, enamels, and gasoline, releasing the by-products of these processes into the city's air, water, and soil. The Flint River carried the toxic effluent of a city that was at one time an industrial mecca and economic powerhouse. (Butler et al., 2016, p. 94)

While the river had been purportedly cleaned up pursuant to the Safe Drinking Water Act (SDWA), residents remained wary due to the continued use of the river as a dump site for manufacturers like General Motors (GM) (Highsmith, 2009). Furthermore, while the city's own internal reports claimed that the water could safely be used as the primary source of drinking water, some city officials spoke out publicly against the decision, citing pressure from above to make the switch regardless of the safety of the water:

> From: Michael Glasgow

> Sent: Thursday, April 17, 2014 11:05 AM
> Subject: Re: Proposed Water Monitoring - City of Flint
>
> […] I have people above me making plans to distribute water ASAP. I was reluctant before, but after looking at the monitoring schedule and our current staffing, I do not anticipate giving the OK to begin sending water out anytime soon. If water is distributed from this plant in the next couple weeks, it will be against my direction. I need time to adequately train additional staff and to update our monitoring plans before I will feel we are ready. I will reiterate this to management above me, but they seem to have their own agenda. (M. Glasgow, personal correspondence, April 17, 2014)

Because of the long history of pollution, the primary concern was whether the water would meet SDWA regulations or not. To achieve this, the WTP referenced a 2011 report commissioned by the city which notes that river water will require more treatment than DWSD water and recommends a number of precautions to take including capital improvements to the WTP and the addition of phosphate as a corrosion control (ROWE & Lockwood, Andrews & Newman, 2011). While there were steps taken to ensure clean drinking water, these recommendations were largely dismissed—particularly the recommendation that the City add a corrosion control like phosphate to the river water, which was required by federal regulation. When asked about the use of corrosion control, responses ranged from affirming that Flint was using optimized corrosion control to admitting that it was not using *any* corrosion control:

> From: Busch, Stephen (DEQ)
> Sent: Friday, February 27, 2015 1:48 PM
> To: Crooks, Jennifer; Deltoral, Miguel
> Cc: Rosenthal, Adam (DEQ); Poy, Thomas; Porter, Andrea; Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
> Subject: RE: HIGH LEAD: FLINT Water testing results
>
> The City of Flint […] has an Optimized Corrosion Control Program (S. Busch, personal correspondence, February 27, 2015)
>
> From: Prysby, Mike (DEQ)
> Sent: Friday, April 24, 2015 20:32 AM
> To: Cook, Pat (DEQ)

> Cc: Busch, Stephen (DEQ); Rosenthal, Adam (DEQ)
> Subject: RE: Flint Corrosion Control
>
> As we discussed, Flint is not practicing corrosion control treatment at the WTP. (M. Prysby, personal correspondence, April 24, 2015)

In terms of water quality, the Flint River water encountered three major problems throughout the FWC, only one of which was portrayed in the common narrative of the crisis: (1) Legionella; (2) trihalomethanes (TTHM); and (3) lead and other heavy metal pollutants.

Legionella, which causes Legionnaire's disease, spread through the water because of insufficient water treatment at the plant (Flint Water Advisory Task Force, 2016). While the MDEQ initially shirked responsibility for one of the largest Legionnaires outbreak in the past decade, which killed 12 people between 2014 and 2016, it has since been attributed to the water switch:

> From: Wurfel, Brad (DEQ)
> Sent: Friday, January 30, 2015 10:14 AM
> To: Murray, David (GOV)
> Subject: RE: When you have a few minutes today
>
> […] I don't want my director to say publicly that the water in Flint is safe until we get the results of some county health department epidemiological traceback work on 47 cases of Legionnaires disease in Genesee County since last May. (B. Wurfel, personal correspondence, January 30, 2015)

TTHM contamination was caused by over-treatment of the water at the plant. TTHMs are a byproduct of water treatment agents, and at high concentrations can act as a slow-acting carcinogen (Flint Water Advisory Task Force, 2016). Mandatory testing caught the high TTHM rates, as well as other contaminant like fecal coliform, which forced the city to issue notices and, in some cases, boil water advisories to inform residents and recommend precautions (Flint Water Advisory Task Force, 2016). TTHM contamination caused the water to be highly corrosive—so much so that the GM plant located in Flint

made a deal with the City to return to DWSD water as the river water was corroding their auto parts, switching back just months after the initial switch (Flint Water Advisory Task Force, 2016; Fonger, 2014b, 2014c). This increased corrosivity was directly responsible for the high lead levels found in Flint water. The lead contamination was caused by a lack of corrosion control in the water, which allowed the water to strip away at the vast network of pipes in the city, many of which contained or were made of lead, allowing that lead to leach into the water (Flint Water Advisory Task Force, 2016). While lead took center stage in the common narrative of the crisis, any one of these pollution problems could have (and should have) been labeled a crisis alone, particularly given the fact that they were (and are) all connected. This leads into the second major sustainability problem in flint: infrastructural instability.

The City of Flint was rapidly built in response to demand for housing from GMs growing number of manufacturing employees (Highsmith, 2009). The city's exponential growth spawned severe infrastructure crises, housing shortages, and public health calamities" (Highsmith, 2009, p. 31). As GMs profits soared, so too did the population and prosperity of the city—but when the Great Depression hit, GM largely abandoned Flint and its dependent population. In response, people with the means to do so started leaving Flint, taking their money and resources with them. Today, the city is home to about a third of its carrying capacity and relies on infrastructure that is, in some cases, as old as the city itself. Those who remained in Flint were (and are) largely low income; this combined with the fractional population means that there were limited tax revenues that could be used to improve infrastructure. It is also important to note that this history disproportionately impacted Black Americans who were systematically excluded from

owning homes through the racist practice of redlining and tended to be the first laid off by GM (Highsmith, 2009). The weak, aging infrastructure in Flint was a major factor in the FWC, particularly in terms of lead distribution. The abundance of lead pipes combined with the lack of corrosion control treatment meant that lead easily leached from the pipes and into the drinking water of Flint residents. This could have been addressed through routine testing in accordance with the LCR if not for the City's weak environmental regulations and weak interpretation of federal regulations.

Routine testing caught TTHM contamination as well as other contaminants such as fecal coliform and allowed the city to send out boil water advisories to address water quality concerns with the residents. Routine testing should have caught the elevated lead levels, and in some ways, it did. Interpretation of the LCR allowed MDEQ officials to essentially control the results of LCR testing. Specifically, MDEQ pre-flushed taps prior to collecting samples, which Miguel Del Toral argued misrepresented the data as it led to lower lead level results than were likely present (Flint Water Advisory Task Force, 2016). While this was not standard operating procedure for the EPA or MDEQ, it did not violate the LCR's testing procedure; the argument for pre-flushing was that without it, lead could stagnate in pipes and lead to higher water lead results than were likely to be encountered by consumers:

> From: Prysby, Mike (DEQ)
> Sent: Thursday, February 26, 2015 10:25AM
> To: Crooks, Jennifer
> Cc: Busch, Stephen (DEQ); Rosenthal, Adam (DEQ)
> Subject: RE: HIGH LEAD: FLINT Water testing Results
> I recall Adam showing me a high lead/copper sample result (perhaps it was this one [Walters' home])… as part of the city's routine lead-copper monitoring. If so, it was a stagnated sample as part of the sampling protocol. […] They [the City] should offer to re-sample for PB after flushing the tap to demonstrate that flushing

> the tap will reduce the lead concentration. (M. Prysby, personal correspondence, February 26, 2015)

When this practice was called into question by people like Curt Guyette from the American Civil Liberties Union (ACLU), Marc Edwards, and Miguel Del Toral, City officials reacted with near tangible disdain:

> From: Tommasulo, Karen (DEQ)
> Sent: Tuesday, July 07, 2015 10:29 AM
> To: Wurfel, Brad (DEQ)
> Subject: Call from ACLU reporter about Flint
> I got a weird call from a "reporter" with the ACLU asking about Flint drinking water. His name is Curt Guyette, and I'm 98 percent sure it's the same guy who used to work at the Metro Times.
> He said he heard from someone at EPA that we use a "flawed methodology" to collect our water samples. We apparently tell people to flush the water from their pipes, let it sit overnight, and then take the sample in the morning. He claims this doesn't measure what's in the main pipes, only in the pipes leading directly to their house. Consequently, he claims, we vastly underestimate lead. Apparently the EPA and Virginia Tech sampled a house using a different methodology and found 13,000 ppb lead. (K. Tommasulo, personal correspondence, July 7, 2015)

Furthermore, internal communication shows a lack of consensus within the MDEQ:

> From: Wurfel, Brad (DEQ)
> Sent: Thursday, July 09, 2015 4:54 PM
> To: Busch, Stephen (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
> Cc: Pallone, Maggie (DEQ); Wyant, Dan (DEQ)
> Subject: FW: here's the interim report
> […] Her [Lindsey Smith, reporter] inquiry has to do with EPA's Miguel making an assertion that we (DEQ) encourage people to flush their pipes before taking a water sample… which is the opposite of what you described to me as the protocol. Miguel apparently asserts that the DEQ and EPA are at odds on proper protocol. Which seems weird. (B. Wurfel, personal correspondence, July 9, 2015)

Furthermore, MDEQ removed a number of sites with high lead levels from their sample pool using arbitrary excuses and directed employees to collect samples they knew would be under the federal AL:

> From: Rosenthal, Adam (DEQ)
> Sent: Thursday, June 25, 2015 10:48 AM
> To: Mike Glasgow; 'bwright@cityofflint.com'
> Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)

> Subject: 6/30 & 7/1/15 deadlines
> […] We hope you have 61 more lead/copper samples collected and sent to the lab by 6/30/15, and that they are will be below the AL for lead. As of now with 39 results, Flint's 90th percentile is over the AL for lead. (A. Rosenthal, personal correspondence, June 25, 2015)

In the case of LeeAnne Walters, her home was removed from the sample pool because she used a home filtration system, which was thought to misrepresent the data because the water would, theoretically, be higher quality than that of homes without that system:

> From: Busch, Stephen (DEQ)
> Sent: Friday, February 27, 2015 1:48 PM
> To: Crooks, Jennifer; Deltoral, Miguel
> Subject: RE: HIGH LEAD: FLINT Water testing results
> The City of Flint:
> - Has a 90th percentile lead level of 6.0 ppb based on 100 samples collected in its most recent monitoring period of 7/1/2014-12/31/2014, with 2 samples (23 & 37 ppb) over the AL
> - Has an Optimized Corrosion Control Program
> - Conducts quarterly Water Quality Parameter monitoring at 25 sites and has not had any unusual results
> - Has never had a 90th percentile lead AL exceedance
> - 212 Browning, the site in question, is not part of the City's established sample site pool. The residence consists of PVC plumbing materials, and has an iron pre-filter at the service connection. (S. Busch, personal correspondence, February 27, 2015)

MDEQ was never technically out of compliance with the LCR, but they certainly did not follow the spirit of the regulation, instead using their interpretation of the rules to claim that the water was cleaner and safer than it actually was.

These water system problems are sustainability problems and they have sustainable solutions, such as (1) adding corrosion control or switching back to DWSD water; (2) replacing aging pipes; and (3) updating the LCR. All of these solutions have been or are in the process of being implemented in Flint. Furthermore, in the rare instance when Flint is discussed as a sustainability problem, it is discussed in the context of these problems in relative isolation from the expansive problems exposed by the water crisis,

such as racism, high water rates, corruption in the criminal justice system, and an utter lack of representational democracy (Baum, Bartram, & Hrudey, 2016; Morckel, 2017b, 2017a; Pieper, Tang, & Edwards, 2017; Wang, Kim, & Whelton, 2019; Zahran et al., 2017). Sustainability as a field does not have the theory or language to discuss these other problems nor does it have the ability to address them. This is due in part to sustainability's aforementioned reliance on positive science and traditional definitions of experts in the FWC—MDEQ, city officials, the EPA—experts that claimed time and time again that there was no problem with the water in Flint. In contrast, an environmental justice lens shows these experts as part of the problem.

ENVIRONMENTAL JUSTICE IN FLINT

Activists have identified a number of environmental justice concerns in Flint, including (1) the historical traumas of racism; (2) pre-existing water concerns; (3) the criminal in/justice system; and (4) lack of representational democracy (Flint Water Advisory Task Force, 2016). The historical traumas of racism are critical to understanding why and how the FWC happened. Within Flint, "rigid forms of racial segregation (many of them rooted in public policies[such as redlining]) relegated thousands of black families to overcrowded, polluted, and dilapidated neighborhoods near GM factories, particularly in the city's North End" (Sadler & Highsmith, 2016, pp. 145–146). Central to this is the idea of redlining, a racist policy and practice stemming from Jim Crow that delineated predominantly white areas as *green* or "safe" for housing lenders to do business in and predominantly Black areas as *red* or "risky." Risky areas were largely deemed ineligible for housing assistance by the Federal Housing Administration (FHA), which meant that families wanting to live in those areas would

have to take sub-standard loan agreements not insured by the FHA or rent (Coats, 2014). Furthermore, Black families wanting to live in areas that were eligible for FHA assistance were barred from doing so under the racist assumption that having a Black family in a neighborhood would drive down property value for the other homes (Coats, 2014). This served to further segregate American cities and towns, with Black families relegated to inner cities while white families fled to the suburbs. In addition, families that were stuck renting or had to take sub-par loan agreements were "locked out of the greatest mass-based opportunity for wealth accumulation in American history" (Coats, 2014). Because of this,

> African Americans who desired and were able to afford home ownership found themselves consigned to central-city communities where their investments were affected by the 'self-fulfilling prophecies' of the FHA appraisers: cut off from sources of new investment[,] their homes and communities deteriorated and lost value in comparison to those homes and communities that FHA appraisers deemed desirable. (Coats, 2014)

While the official practice of redlining "ended" in the late 1960s, the legacy of the practice persists in neighborhood covenants and racial prejudice in the loan industry. In industrial areas like Flint, this segregation only intensified after the economic downturn that saw GM cut its workforce. White families took this opportunity to move out of the city and into suburbs while Black families had little choice but to stay despite the ancient and crumbling infrastructure that would play a part in the FWC:

> Over the past three-quarters of a century, a harsh mix of disinvestment, 'white flight,' metropolitan political fragmentation, and persistent racial discrimination transformed this once economically vibrant although deeply divided city into one of the poorest, most racially segregated metropolitan regions in the United States. In the end, these forces decimated the local tax base and eroded the city's infrastructure, thus setting the stage for the state's 2011 takeover of the municipal government and the ensuing FWC. (Sadler & Highsmith, 2016, p. 144)

The city's heavy reliance on GM left it one of the least economically diverse regions in the nation, which meant that when GM cut jobs, many people were unable to find other employment because it simply was not available (Sadler & Highsmith, 2016, p. 147). This, combined with the lack of wealth, left the city in a state of economic crisis that "manifested itself not only in high rates of urban poverty and racial segregation but also in the urban fiscal and infrastructural crises that have collided so powerfully since 2014" (Sadler & Highsmith, 2016, p. 150). One factor of this that was highly publicized in Flint prior to the FWC is the notoriously high water rates imposed on Flint residents. In August of 2014, Wantwaz Davis argued:

> Water is supposed to be a necessity and the water rates are extravagant. If an elderly person died here because you turned water off, that could be construed as murder. […] The human body is 70 to 75 percent water. We can go without food for a long period of time, but never water, which should be affordable. (Fonger, 2014a)

These high rates were cited by EM Jerry Ambrose after the switch to the Flint River as a reason the City could not return to DWSD:

> The oft-repeated suggestion that the city should return to [the Detroit Water and Sewerage Department], even for a short period of time, would, in my judgment, have extremely negative financial consequences to the water system, and consequently to rate payers. By the most conservative estimates, such a move would increase costs by at least $12 million annually [and] the only recourse within the city's control would be to increase revenues significantly. And in my judgment, that would come from raising rates for water by 30 percent or more. (Fonger, 2015b)

Because of the lack of revenue in Flint, city officials decided to charge Flint residents for the water they used at a rate that would cover the entire infrastructure as well as the water lost to leaks due to poor infrastructure. This meant that Flint was paying exponentially more than neighboring cities. This largely began in early 2011, when EM Jerry Brown increased water and sewer rates by 110 percent over the course of about a

year and a half (Flint Water Advisory Task Force, 2016). In 2014, Flint was paying "$65 more per month in water and sewer rates than the next highest municipality in Genesee County, and $120 more than the lowest" (Adams, 2014). In August 2014, City Councilmember Wantwaz Davis led a protest demanding lower water rates just seven days before the first boil water advisory was issued, recommending that residents boil their water or purchase bottled water (Flint Water Advisory Task Force, 2016). Flint residents were charged some of the highest water rates in the country for water they could not use; water that was poisoned:

> @PsychoSloth_
> Literally, the US EPA just got caught covering up themselves because they POISONED the water in Flint, MI. Kids drink that water, man.
> 4:45 PM – 19 Oct 2015 (PsychoSloth, 2015)

> @mccannr1
> Each speaker has said "top priority" is health of Flint residents. Guess that's why they sat on this for a year white kids drank poison water
> 7:20 AM – 8 Oct 2015 (Mccannr1, 2015)

> @Jonesj1107Jones
> After all that has happened to Flint and its residents the last thing we need is to be poisoned by our water. And charged 100$ before a drop
> 6:36 AM – 21 Jan 2015 (Jonesj1107Jones, 2015)

For some Flint residents, these water rates simply were not affordable, so they did not pay. The city responded to this by shutting off water services to those with overdue bills. Furthermore, these individuals were criminalized by the city because of their inability to pay, leading to higher rates of interaction with the criminal justice system, such as in the case of Simeon King, who was accused of obstructing a water theft investigation:

> Genesee County Circuit Court Judge Geoffrey L. Neithercut dismissed a case against Simeon King, 49, who officials claimed obstructed a water theft probe at a Flint home. Prosecutors alleged that when Marcus Mahan, a deputized special investigator assigned to investigate water theft in Flint, tried to enter King's

> girlfriend's house to examine the water meter, King would not allow him inside, would not provide his identification and allegedly pushed Mahan and another uniformed officer out of the home. […] Al Zerka, King's defense attorney, argued that King did not have to let Mahan into the home and that he should not have to provide identification to police when he had done nothing wrong and was minding his own business inside the home when police knocked on the door. […] King did not obstruct police officers, because they had no right to be inside the home, his attorneys said. (Young, 2014c)

This was particularly true for people who "illegally" turned the water back on, such as City official Warren Southall II, who was arrested after being caught "illegally" turning a resident's water back on:

> A city of Flint employee has been charged and arraigned following his arrest last week on accusations that he illegally turned on a resident's water. […] Warren Southall II, 37, has been charged with one count of malicious destruction of utility property, according to Flint District Court Records. (Young, 2014a)

This problem was apparently so prolific that the city had to create a task force to deal with what they called "water theft" (Flint Water Advisory Task Force, 2016). This taskforce, which in 2014 was investigating over 50 cases related to water theft, was headed by retired police officer Marcus Mahan, who said,

> We know that there are numerous individuals out there that think they can steal from their neighbors, their city, whoever it may be. That is not the case. We are going to prosecute you, and we are going to prosecute you to the fullest. (Young, 2014b)

It is important to remember that this criminalization was happening *after* the initial switch, meaning the water was already poisoned.

Perhaps the most significant environmental justice problem faced during the FWC was the lack of representational democracy through the appointment of an EM beginning in 2011. The role of the EM was to save the city money whatever the cost, and they had the authority to override the mayor and city council in order to accomplish this:

> Pursuant to Public Act 436, the Emergency Manager has broad powers in receivership to rectify the financial emergency and to assure the fiscal

> accountability of the City of Flint and its capacity to provide or cause to be provided necessary services essential to the public health, safety and welfare; and
>
> Pursuant to Public Act 436, the Emergency Manager acts in place of local officials, specifically the Mayor and City Council, unless the Emergency Manager delegates specific authority; and
>
> Pursuant to Public Act 436, the Emergency Manager has broad power to manage the local government, and may issue orders to elected and appointed officials necessary to accomplish the purpose of the Act; and
>
> Pursuant to Public Act 436, the Emergency Manager is issuing this order to rectify the Financial Emergency and allocate responsibilities in the event of the appointment of a Receivership Transition Advisory Board. […]
>
> (a) The Mayor and City Council shall implement all of the following financial best practices within the city and do all of the following:
>
> 1) Safeguard the financial stability by seeking out, approving, and implementing cost-saving measures recommended by the City Administrator, the Board, or both. […]
>
> 4) The City Council shall not interfere with the employees of the City. (STAFF 2 PAGE 144)

It was an EM who made the decision to sign on to the KWA and it was likewise an EM who decided to use the Flint River in the interim. Many in Flint have called this a dictatorship as the EM was responsible only to the Governor of Michigan rather than to the people of Flint. Furthermore, while Flint Mayor Dayne Walling has been the subject of much well-earned criticism, little attention has been paid to city council members who were vocal during the FWC such as Eric Mays, Wantwaz Davis, and Scott Kincaid. While it is impossible to know what would have happened had Flint not been under the control of an EM, it is significant that the government—particularly the City Council—chosen by the residents of Flint (or at least parts of it) was so outspoken about water justice concerns.

It is also significant that this stripping of democratic rights occurred in a majority Black area as it reflects the long history of disenfranchisement of Black Americans beginning with chattel slavery. This is clear in the 3/5 compromise, which delineated Black Americans as less human that whites for the purposes of maintaining white control of government as well as felony disenfranchisement rules, which disproportionately impact Black Americans who are already disproportionately targeted by the prison industrial complex (Alexander, 2012; Stanley & Smith, 2015).

In this chapter, I retold the story of the FWC through the narrative lens afforded by government officials and media outlets during the time of the crisis. I then examined the FWC through the lens of IEV and the lens of sustainability, asserting that the solutions offered by a sustainability discourse were and are insufficient to address IEV in Flint. I asserted this by analyzing the environmental injustice and racism that occurred prior to the crisis and persists to this day, factors that are likewise insufficiently addressed by environmental justice discourse. In the following chapter, I will analyze the role that knowledge production plays in sustainability discourse broadly and the FWC specifically, highlighting the significance of narrative structure in environmental crises.

CHAPTER 4: THE ROLE OF NARRATIVE AND KNOWLEDGE IN IEV

In this chapter, I examine the role that knowledge production plays in addressing IEV. I begin by returning to the idea of narrative, comparing the FWC to Love Canal in their shared reliance on a white mother as the main character. In order to explain this reliance, I then analyze the discourse of knowledge production in terms of sustainability discourse and the FWC. Patel (2016) contends that "settler colonialism, with its architecture of racist capitalism, relies on narratives that blur its purposeful inequitable violence" (Patel, 2016, pp. 399–400). The narrative of the FWC is gendered and racialized in such a way as to reinforce the hegemonies of white supremacy and patriarchy while illustrating that justice always prevails, effectively masking the deliberate violence experienced by those impacted. This narrative centers on a lower-income white mother who "single-handedly" saves her community from environmental degradation by partnering with scientists and refusing to back down. This mirrors the narrative of Lois Gibbs and her role in Love Canal:

> In 1978, as a twenty-seven-year-old housewife, Lois Gibbs discovered that her child was attending an elementary school built on top of a 20,000-ton toxic chemical dump in Niagara Falls, New York. Out of desperation, she organized her neighbors into the Love Canal Homeowners Association and struggled for relocation. […] Dioxin. She was the subject of a CBS prime-time movie and received awards including the 1990 Goldman Environmental Prize; an honorary Ph.D. from the State University of New York, Cortland College; the 1998 Heinz Award; and the Independent Sector's John W. Gardner Leadership Award. (Gibbs, 2002, p. 97)

Stories that do not fit this narrative rarely get the same sort of national attention or wide recognition, such as in the case of Black Mesa or Standing Rock. A critical element to these narratives is a happy ending—Love Canal resulted in the relocation of residents, proving that with enough pressure from a white woman with science on her side, anything is possible.

This narrative structure erases the thousands of Black and non-Black people of color (NBPOC) residents who spoke out in Love Canal:

> White women's maternalistic language emerged loudly during the Love Canal crisis. Lois Gibbs's effective use of the media eclipsed other types of rhetoric being used, as well as other groups' visibility, including not only male residents, but also African Americans in the neighborhood. (Blum, 2008, p. 63)

And in Flint:

> No citizens who complained publicly about the water [in Flint] almost right away were cited as heroes, nor were any of the pastors who organized months of protests and marches. Neither were any of the local politicians who took the people seriously early nor any of the community coalitions, local businesses or ex-felons who participated in bottled water drives when Flint was only a local story. Most of the original families who promptly conducted home lead testing remain anonymous. (Jackson, 2017)

The City of Flint is nearly three fifths Black, and yet the central figures of the FWC remain largely white. Not only is this problematic, but it contributes to this narrative of environmental justice problems as requiring white women and scientists in order to be "solved." The FWC is certainly not "solved," as the causal factors and justifiable distrust of the water and the government remain, although switching back to DWSD water does make a compelling resolution in terms of this narrative, which furthers my point. This narrative simplistically centers the role of experts while devaluing the lived knowledge and actions of a community of residents. The facts show that Flint residents voiced concerns immediately; thousands tested their water, organized, protested, and tried to convey their expert knowledge of the crisis to those with the power to do something about it. This does not conform to the narrative expectations that, instead turns residents into victims needing to be saved.

In order to analyze why the community's efforts were largely ignored, I turn now to the idea of *knowledge* in Flint, and how the hierarchies of different forms of

knowledge and knowledge production are assigned values differently within sustainability and justice problem identification and problem-solving. Specifically, because of the emphasis on global problems and science-based technical solutions in mainstream sustainability discourse, certain forms of knowledge production that fit within the rigid standards enforced by positivist science in academia are valued above all others. In contrast, social justice organizing praxis is largely built around knowledge produced by impacted communities regardless of that knowledge's "expert" credentials.

KNOWLEDGE PRACTICES

The production of knowledge is, in terms of Western cultural perception, centered in positivist science; it thrives in methodologies and theoretical frameworks and scientific processes. This is rooted in colonial exclusion that sought and seeks to assert the dominance of Western (white) culture and bodies. This paints scientific knowledge as "conveying an evidence-based type of knowledge, universal and ubiquitous and, therefore, more sound and effective" than ways of knowing that do not depend on academia or the scientific process (Benessia et al., 2012; Casas-Cortes, Osterweil, & Powell, 2008; Gibbs, 2002; Tarlock, 2002). This type of knowledge then becomes *evidence*, which "is increasingly emerging as to what ultimately defines the Modern state's decision-making, regulatory, and judicial processes. As promoted, it seems to be the result of well-established neutral and objective scientific processes, when, in practice, it is intrinsically context- and value-dependent" (Benessia et al., 2012, p. 78). This positivist view of science implies a level of objectivity that we as individuals and society are fundamentally incapable of attaining as we are necessarily a part of society. While sustainability is largely dependent upon positivist science as a basis for action, many in

sustainability also recognize the need for the inclusion of non-scientific voices, such as stakeholders.

This is the process of *stakeholder analysis*, which "i) defines aspects of social and natural phenomenon affected by a decision or action; ii) identifies individuals, groups, and organisations who are affected by or can affect those parts of the phenomenon […]; and iii) prioritises these individuals and groups for involvement in the decision-making process" (Reed et al., 2009, p. 1933). Implicit in the term stakeholder is the idea of power; the original meaning of the term stakeholder "is a person who literally held the money of the bettors while the game was on" (Sharfstein, 2016, p. 477). While some models of stakeholder analysis, particularly those in sustainability, do include power differentials between stakeholders, there remains an assumption that those who hold a stake in a problem have some level of power to contribute to a solution. This assumption becomes even more clear in the practical application of stakeholder participation, in which individuals with the least power are also the least likely to be able to participate because of temporal or financial constraints. Furthermore, the term stakeholder "carries an assumption that all stakes have equivalent intrinsic merit" (Sharfstein, 2016, p. 477). Under the neoliberal paradigm model, this leaves corporate, governmental, and non-governmental bodies to make the decisions; "in a world where everyone is a 'stakeholder,' there is less room for public interest" (Sharfstein, 2016, p. 478). While there are some models that endeavor to address the lack of public participation and power dynamics, there remains the assumption of power, the assumption of intrinsic value, and the assigning of stakeholder identity by experts. Implicit in how experts define

stakeholders in a bias towards positivist ways of knowing, which serves as a gatekeeper to expert status.

The purpose of stakeholder analysis is to identify groups and individuals that the experts believe should have a place at the table; stakeholders are then invited to participate in and contribute to discussion of solutions. It is therefore significant that current models of stakeholder identification and engagement are exclusionary to individuals and types of knowledge that do not comply with the normative structures and ideals of traditional academic spaces. This is evident in the way Downing et al. (2003) discuss the differences between *expert stakeholders* and *citizens*: "expert stakeholders are likely to seek solutions to current problems, whereas general awareness of environmental issues is usually the focus for a citizen panel" (Downing et al., 2003, p. 190). This implies a lack of education among the citizen group while reaffirming the discursive power of the expert stakeholder. This is echoed in the way that Downing et al. (2003) portray the role of the sustainability professional, who acts as "an expert for citizens, but may be more of a generalist […] for expert stakeholders who have a wealth of specialist knowledge" (Downing et al., 2003, p. 190). This stratification of value when it comes to ways of knowing is indicative of a positivist approach to sustainability science.

To combat this stratification, some sustainability scientists have worked to develop alternative models of stakeholder engagement and public participation within a *post-positivist* framework. Dedeuwaerdere (2017) outlines four such approaches: (1) post-positivist transdisciplinary partnership research; (2) backward-looking interpretative research; (3) forward-looking interpretative research; and (4) critical theory approach. Post-positivist transdisciplinary partnership research is defined by researchers including

practitioners as producers of knowledge; "according to this approach, practitioners have scientifically relevant knowledge about implementation and unique know-how that is crucial in conducting the social experiments" though, "in many situations […], scientists still play the central role" (Dedeurwaerdere, 2018, p. 81). Forward- and backward-looking interpretative research seeks to deepen contextual understandings through considering as many alternative perspectives that are considered valid from certain viewpoints and in certain situations" such that all voices are heard and given equal value (Dedeurwaerdere, 2018, p. 81). The critical theory approach responds "to inequalities in society, by making oppression based on gender, race, nationality, ethnicity, sexual orientation, social class or work obvious and helping such oppressed groups to free themselves" (Dedeurwaerdere, 2018, p. 81). While critical theory is common in many fields of social science, sustainability remains dependent on post-positivist transdisciplinary partnership research as well as backward- and forward-looking interpretative research, which leaves the role of knowledge producer in the hands of sustainability experts.

Community empowerment literature centers the idea of power as a tool for change. In particular, this literature discusses *power-over* as it contrasts *power-with*; power-over describes "the ways of using power that dominate or control" while power-with is the cooperative use of power "that doesn't seek to dominate or control" (Kelly, 2003, p. 20). Power-over is how we typically think of *power*; this includes organizational/institutional leaders who dictate rules and actions as well as normative structures that shape a society (i.e. heteronormativity, white supremacy, male dominance), and is the basis for the neoliberal leadership paradigm defined by Howieson et al. (2019)

(DataCenter & First Wednesdays Planning Committee, 2009, p. 949; Howieson et al., 2019). Stakeholder engagement within sustainability is dependent upon power-over, situating the expert as the one with the appropriate knowledge and giving them the authority to make decisions.

This is reflective of the *banking concept* of learning, wherein "knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing. Projecting an absolute ignorance onto others, a characteristic of the ideology of oppression, negates education and knowledge as processes of inquiry" (Freire, 1970, p. 72). This is rooted in the colonial narrative of meritocracy, wherein education (which is inaccessible to many, particularly at the higher level) is portrayed as the "arbiter of social mobility" (Patel, 2016, p. 398). This then serves to sort people into social positions such as "owner, laborer, [or] manager" and subsequently justify those very social structures "through the narratives of societal promise, constant opportunity, and self-rationalizing myths of meritocracy" (Patel, 2016, p. 399). This serves to relegate knowledge that does not adhere to traditional academic models as inferior and inherently less valuable and creates a dichotomy of legitimate and layperson knowledge. In Flint, legitimate knowledge came from government officials who used their access to positivist scientific knowledge as a form of power to make decisions while layperson knowledge, which was produced by those affected by the water crisis, was delegitimized and under-valued for its lack of positivist scientific backing.

LEGITIMATE KNOWLEDGE

Throughout the first two years of the FWC, city, state, and county officials emphasized the role of legitimate knowledge as a way of gate-keeping admissible

information. From April 2014 when the initial switch was made to February 2015, officials at MDEQ and under the EM dismissed any and all claims of poor water quality coming from residents on the basis that the water was testing fine according to their standards. When fecal coliforms were found in the water, it was found by city officials who then disseminated information about the outbreak. When TTHM levels exceeded the federal AL, the city once again disseminated information in accordance with federal law. The knowledge of residents who used the water was not considered legitimate knowledge for the lack of "expert" credentials and was dismissed in the face of scientific data that ostensibly proved the safety of the water. Moreover, this steadfast reliance on City and State data persisted even in the face of scientific studies conducted by conventionally-defined *experts* like Miguel Del Toral/EPA, Professor Marc Edwards, and Dr. Mona Hanna-Attisha. These three experts were not considered producers of legitimate knowledge because the knowledge they produced did not conform to City and State knowledge—they and their knowledge were considered outliers.

When Miguel Del Toral tested LeeAnne Walters' water to find high lead levels, he immediately contacted the MDEQ to find answers. He knew that the City was monitoring lead and copper levels in drinking water per federal policy and reached out to MDEQ to ask what kind of corrosion control the City was using and question their lead testing methods. These required samples to be taken after pre-flushing the pipes, which has been known to result in lower lead level results that do not reflect actual lead levels. The response he got from Stephen Busch, a district supervisor with the MDEQ, doubled down on the City's methods and implied that Del Toral was not qualified to be asking such questions:

From: Busch, Stephen (DEQ)
Sent: Friday, February 27, 2015 1:48 PM
To: Crooks, Jennifer; Deltoral, Miguel
Subject: RE: HIGH LEAD: FLINT Water testing results
The City of Flint:

- Has a 90th percentile lead level of 6.0 ppb based on 100 samples collected in its most recent monitoring period of 7/1/2014-12/31/2014, with 2 samples (23 & 37 ppb) over the AL […]
- Has an Optimized Corrosion Control Program
- Conducts quarterly Water Quality Parameter monitoring at 25 sites and has not had any unusual results
- Has never had a 90th percentile lead AL exceedance
- Continues to meet all applicable plant tap standards and treatment technique requirements at its WTP […]

212 Browning, the site in question, is not part of the City's established sample site pool. (S. Busch, personal communication, February 27, 2015)

Busch essentially argued that the City was adhering to federal guidelines, which are often assumed *expert*, and therefore could not and should not be questioned. This creates what is effectively a hierarchy of knowledge:

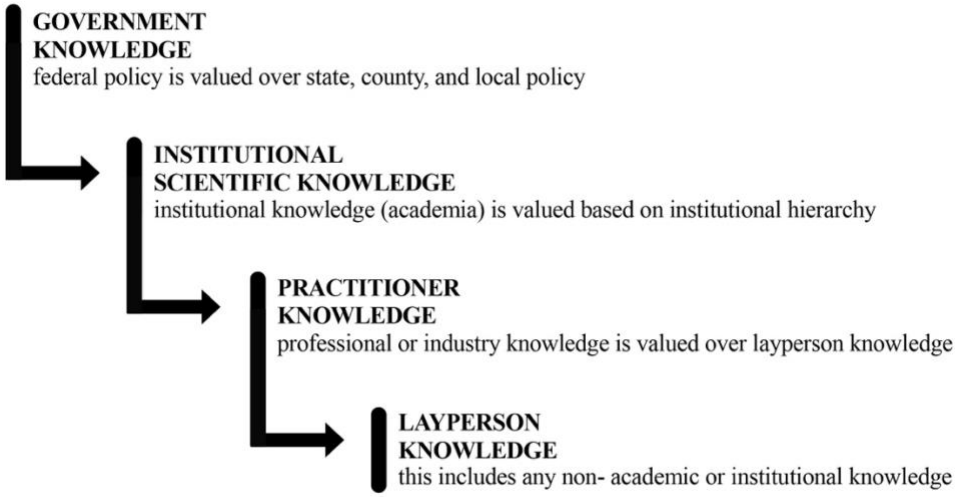

Figure 2. *Hierarchy of knowledge in the Flint Water Crisis*

This is highlighted on June 24, 2015, when Del Toral sends his "Interim Report: High Lead Levels in Flint, Michigan" to his supervisor, Tom Poy, and LeeAnne Walters.

Because Del Toral's memo was technically a draft, it was largely dismissed by the MDEQ and City government:

> From: Busch, Stephen (DEQ)
> Sent: Thursday, July 09, 2015 5:21 PM
> To: Wurfel, Brad (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
> Subject: FW: here's the interim report
> Obviously we are not going to comment on an interim draft report. (S. Busch, personal correspondence, July 9, 2015)

The implication is that despite Del Toral having extensive knowledge of lead in water, his memo should not be acted upon because it had not been reviewed by superiors at the EPA, effectively relegating it from *government knowledge* to *scientific* or even *practitioner knowledge*. The memo became even less credible when LeeAnne Walters shared it with Curt Guyette, a reporter with the ACLU:

> On Aug 27, 2015 at 3:15 PM, Wurfel, Brad (DEQ) wrote:
> This person [Del Toral] is the one who had EPA lead specialist come to her home and do tests, then released an unvetted draft of his report (That EPA apologized to us profusely for) to the resident [Walters], who shared it with the ACLU, who promptly used it to continue raising hell with the locals.
> Bottom line is that folks in Flint are upset—because they pay a ton for water and many of them don't trust the water they're getting—and they're confused, in no small part because various groups have worked hard at keeping them confused and upset. We get it. […] But it's been rough sledding with a steady parade of community groups keeping everyone hopped-up and misinformed. (B. Wurfel, personal correspondence, August 27, 2015)

Here the implication becomes that the ACLU used Del Toral's non-expert memo to distort information in order to prompt Flint residents to protest the water. There is likewise an implicit bias against the so-called "locals" who, by this logic, cannot produce knowledge but instead must be given knowledge and similarly are not qualified to discern *good* knowledge from *bad* knowledge.

This bias is mirrored in the reaction by government officials to Edwards' FWS. In an email sent to a reporter with the Flint Journal, Wurfel politely implied that the FWS

results should not be trusted because they did not come from a certified lab and did not reflect the results reported by the City:

> From: Wurfel, Brad (DEQ)
> Sent: Wednesday, September 08, 2015
> To: Ronald Fonger
> Subject: RE: flint water
> The state DEQ is just as perplexed by Edwards' results as he seems to be by the city's test results, which are done according to state and federal sampling guidelines and analyzed in certified labs.
>
> When I said we were unsure how the Virginia Tech team got its results, that's not the same as being surprised that they got them. There are a conservatively estimated 15,000 old homes with lead plumbing in Flint alone, and this group specializes in looking for high lead problems. They pull that rabbit out of that hat everywhere they go. Nobody should be surprised when the rabbit comes out of the hat, even if they can't figure out how it is done.
>
> It's scientifically probable a research team that specializes in looking for lead in water could have found it in Flint when the city was on its old water supply. We won't know that, because they've only just arrived in town and quickly proven the theory they set out to prove. And while the state appreciates academic participation in this discussion, offering broad, dire public health advice based on some quick testing could be seen as fanning political flames irresponsibly. Residents of Flint concerned about the health of their community don't need more of that. (B. Wurfel, personal correspondence, September 8, 2015)

Here again is the assumption that residents do not produce knowledge and likewise cannot discern *good* knowledge from *bad* knowledge. To clarify Wurfel's assertions, Edwards' team also used state and federal sampling guidelines, although they interpreted them differently. Specifically, whereas the City pre-flushed before sampling, FWS allowed water to stagnate for 6 hours before sampling; both methods were consistent with state and federal guidelines. While Edwards does specialize in water systems, his expertise in high lead levels comes from his time exposing high lead levels in Washington D.C., where he spent several years working with citizen scientists to test residential lead levels (Hanna-Attisha, 2017). Furthermore, Edwards notified the City of

Flint and MDEQ that he and his team would be analyzing water samples for lead shortly after they arrived:

> From: Marc Edwards
> Sent: Sunday, August 23, 2015 4:57 PM
> To: Adam Rosenthal, Rachel Ptaszenski
>
> I am a professor who specializes in research on corrosion, opportunistic premise plumbing pathogens, lead in water health effects and engineering ethics.
>
> Over the next few months we will be studying Flint water quality issues, in conjunction with all parties who are interested in this subject. We will be launching our web page to publicly report results of our work.
>
> Just giving you a heads up on this. We also intend to collaborate with all parties, in an open manner, to the extent that is possible, as our study progresses. (M. Edwards, personal correspondence, August 23, 2015)

This reflects the hierarchy of knowledge wherein government knowledge is valued more than academic knowledge and implies that academic knowledge can be manufactured to meet certain ends. The desire for *objectivity* that is so central to positivism is clear here in the way that Wurfel implies that *good* knowledge cannot come out of knowledge production that has an agenda or is somehow *subjective*.

This same argument was used to discredit Dr. Mona Hanna-Attisha's research, which she presented on September 24, 2015 in a press release. Dr. Hanna-Attisha released her findings immediately upon completion instead of going through the peer review process because she believed that the urgency of the water crisis demanded it (Hanna-Attisha, 2017). Like Del Toral's memo, this was widely criticized by government actors because of its deviance from institutional standards. Government actors immediately tried to discredit Dr. Hanna-Attisha, arguing that she "spliced and diced" her data, used improper methods, and did not have access to enough data to make significant claims (S. Wurfel, personal correspondence, September 24, 2015). As a practitioner of

medicine, Dr. Hanna-Attisha's knowledge was not valued as it did not track with government knowledge per the hierarchy of knowledge. Furthermore, Dr. Hanna-Attisha was criticized by government actors for her use of "a very emotional approach" in her press conference—specifically, she used a fictional child to illustrate the impacts of lead poisoning throughout a person's life (D. Murray, personal correspondence, September 24, 2015). The use of emotion, as well as her clear agenda to inform residents of elevated lead levels, was used to portray her as less credible because she did not conform to institutional standards of objectivity.

LAYPERSON KNOWLEDGE

Before the switch to the Flint River, there was a general understanding in Flint and the surrounding area that the river water was not clean, which stems from the river's long history as a site for industrial dumping. This led to skepticism and outrage when the City announced that it would be using the Flint River as their only source of water while waiting for the Karegnondi Water Authority pipeline to be completed. This general knowledge of the river's poor quality was reflected in social media posts around April 2014 when the water was initially switched:

> @merqwanda
> So they're gonna start using the flint river for drinking water……. Nah.
> 3:04 PM – 24 Apr 2014 (Merqwanda, 2014)

> @LOVEVsLoyalty_
> Flint water is the Flint river water. 😂 😂y'all nastyyyy
> 9:10 AM – 25 May 2014 (LOVEVsLoyalty, 2014)

> @Ladyy_A2Real
> Bro.. I'm thirsty af. I want some water but I refuse to drink that Flint River shit
> 9:05 PM – 1 Jun 2014 (Ladyy_A2Real, 2014)

In an interview with the Flint Journal, resident Jackie Demberton said, "I grew up in Flint, and I know what that Flint River water is about" (Ketchum III, 2015). This is

likewise echoed by Michael Gadola, an employee of the Governor, who wrote in an email to his colleagues:

> From: Gadola, Michael (GOV)
> Sent: Tuesday, October 14, 2014 3:42 PM
> To: Brader, Valerie (GOV); Muchmore, Dennis (GOV); Agen, Jarrod (GOV); Clement, Elizabeth (GOV)
> Subject: RE: Flint water
> […] To anyone who grew up in Flint as I did, the notion that I would be getting my drinking water from the Flint River is downright scary. Too bad the EM didn't ask me what I thought, though I'm sure he heard it from plenty of others. My Mom is a City resident. Nice to know she's drinking water with elevated chlorine levels and fecal coliform. (M. Gadola, personal correspondence, October 14, 2014)

The cultural understanding reflects the Flint River's long history of pollution stemming from the area's booming auto industry and lack of regulation, which led to the byproducts of automobile manufacturing being dumped in the river such that "the Flint River carried the toxic effluent of a city that was at one time an industrial mecca and economic powerhouse" (Butler et al., 2016, p. 94). While the SDWA and other environmental protections of the mid-1990s did substantially improve the quality of the water (though not to the level of potability), the general understanding of the river as a source of pollution remained in the cultural narrative and knowledge of the community.

This community knowledge that Flint river water was "nasty" and undrinkable was seemingly borne out after the water source was switched and Flint River water started to flow from taps. Residents shared photos of brown water, stories of strange smells, and accounts of odd health concerns that seemed to coincide with the water switch. In combining these real-time experiences with an existing cultural knowledge of the poor quality of the river, a collective understanding of the water crisis began to form. This collective seemed to be confirmed by more traditionally valued forms of knowledge like boil water advisories and reports of violations that reflected the collective

understanding of the water as unsafe. This collective understanding, built on countless experiences through countless voices, served as a counternarrative to the City's repeated assurances that the water was perfectly safe. Renn et al. (1992) call this social amplification of risk, asserting that this collective understanding comes about through the consistent sharing of knowledge about the exposure to risk—in the case of Flint, Twitter served as a platform on which to share this knowledge (Renn, Burns, Kasperson, Kasperson, & Slovic, 1992, p. 154). It is here that it becomes important to understand another collective understanding: that the people in power did not serve the interests of the community.

This understanding is built on decades of inherited trauma as well as contemporary experience. The long history of racism, segregation, voter suppression, and medical neglect experienced by Black and NBPOC in the United States (along with countless other injustices) has done little to foster trust in the government from those impacted communities (Omi & Winant, 2015). This lead to a heightened sense and awareness of risk due to the lack of government accountability. These traumas are integral to understanding areas like Flint, a city thrust into economic distress by redlining, segregation, corporate exploitation, and white flight (Highsmith, 2009). These inherited traumas were compounded by the appointment of an Emergency Manager in Flint to address the financial "emergency" that the city found itself in. This appointment effectively deprived the city of a representative democracy, with all elected officials being virtually stripped of their power. Instead, decisions were made with the express goal of saving money, echoing the history of the needs of Black and NBPOC being valued less than financial interests. This cultural understanding is highlighted by the

existence of organizations dedicated to addressing these injustices in Flint, such as the Concerned Pastors for Social Action (CPSA), an organization that was integral to addressing the FWC on the ground in real time.

As early as February 2015, Rev. Alfred Harris of the CPSA demanded that Flint be reconnected to the DWSD:

> The people of Flint are hurting and need immediate help. […] What needs to be done is an immediate reconnection to the Detroit water system. We stand firm in the knowledge that lake water is 100 percent better than river water. […] How would you like to pay for something you're afraid to use? […] The health of the people [should] always come out on top. The No. 1 concern is the health of the people. (Fonger, 2015a)

The pastors were, of course, met with disdain from city and state officials who did not seem to think that the pastors were qualified to be making demands:

> Subject: FW: Flint Pastors Warn They'll Go To Court To Get City Off Flint River Water
> On Apr 8, 2015, at 5:27 PM, "Muchmore, Dennis (GOV) wrote:
> Why not, we haven't anything else to do except spend our time chasing our tail. This issue isn't going to go away until we do some serious comms work in the city. (D. Muchmore, personal correspondence, April 8, 2015)

In fact, as the pastors consistently made their demands, those same city and state officials expressed their frustration that they and other activists refused to believe government assurances that the water was safe:

> From: Muchmore, Dennis (GOV)
> Sent: Wednesday, August 05, 2015 9:04 AM
> To: Hollins, Harvey (GOV)
> Cc: Clayton, Stacie (GOV)
> Subject: RE: '20150804_Meeting with Flint's Clean Water Coalition'
> I didn't think that meeting was as useful as others. If people won't accept the factual information, I'm not sure there is much we can do about it. […]
> The three activists in the room just want to be right, they don't want answers. No matter what we say they'll always want something else to be the answer. The Pastors and the woman form yesterday who usually sits across from me and who always lectures us (that's just a reminder of some of the old time negative racial experiences she's had and I get it) are really a strong group of people. Usually there is a black woman who comes with them, but I missed her yesterday. I really

> *[sic]* her and of course, Overton and Hill are pretty impressive people in their own right. (D. Muchmore, personal correspondence, August 5, 2015)

This feeds into the idea that so-called laypeople are simply not smart enough to understand or accept the information being given to them by the government.

In response to this, the pastors took matters into their own hands, distributing bottled water and filters as often as they could and filing multiple injunctions and lawsuits on behalf of the residents of Flint. The giveaways were announced by the Flint Journal:

> The Concerned Pastors for Social Action have a giveaway planned next week for Flint water customers. The organization plans to giveaway 1,500 water filters to Flint residents on Tuesday, Sept. 1 at 10 a.m. at Mt. Carmel Baptist Church, 1610 Pierson Road in Flint. The water filters will be given away on a first come, first serve basis. (Emery, 2015)

To be clear, the CPSA took these actions prior to any official action on lead in the water and before the FWS produced scientific knowledge confirming the presence of lead.

In this chapter, I revisited the idea of narrative in comparing the narrative of the FWC to that of Love Canal. In order to explain this connection, I then analyzed the role of knowledge production in sustainability discourse and in the FWC. I began by outlining the value of knowledge production in Western positivist scientific tradition—a tradition that values *experts* who hold the objective knowledge needed to address sustainability problems. I then analyzed the role of this kind of *legitimate* knowledge in the FWC, examining the discourse of some of those "experts" at the time of the crisis. I then analyzed the so-called *layperson* knowledge that was being produced at the same time and developing a collective understanding of the FWC. The idea of knowledge production is critical in understanding IEV and how both sustainability and environmental justice discourse remains insufficient on their own to address it,

particularly since sustainability tends to not only devalue, but outright ignore layperson knowledge that is not deemed "valuable." In the following conclusion, I use this knowledge dialectic as grounds to call for the development of a transformative methodology that centers knowledge produced by those immediately impacted by problems.

As of my final submission of this thesis on April 19, 2019, Flint has been without clean water for 1824 days.

CONCLUSION: RETHINKING SUSTAINABILITY IN THE CONTEXT OF VIOLENCE

As demonstrated above from multiple perspectives, the FWC is an ongoing sustainability problem; but when it is discussed as such, it is done using a narrow discourse of expert knowledge that fails to describe and analyze problems that deal with long histories of trauma and inequity. The problems that sustainability is trying to tackle are unfathomably complex, and it is entirely unrealistic to believe that those problems stand any chance of being solved through reform—working within the current system using the tools of that system. The addition of justice goes beyond sustainability to address the roots of unsustainability when those roots extend to problems that positivist science simply cannot address. The normal science model identifies a problem and conducts research to find a linearly related solution, working deductively "from theory to research objectives > research questions > data collection > and so forth, [which] closes down the possibility for collaboration with movements" (Brem-Wilson, 2014, p. 120). This idea of collaboration with impacted communities is critical to addressing IEV and sustainability; in order to critically examine the role that collaboration can play, I turn to contemporary social justice literature, much of which has been developed by social justice movements themselves.

The way that knowledge is valued in positivist science is fundamentally rooted in colonial power; knowledge produced by people with more social power and within powerful institutions is given precedence over knowledge that is not. In particular, "colonial-power-knowledge communicates particular cultural presuppositions that elevate Western knowledge as real knowledge while ignoring other knowledge" (Doxtater, 2005,

p. 619). This has been widely critiqued in the field of Indigenous knowledge, wherein the role of exclusionary knowledge production is rooted in maintaining existing hegemonic power structures. The idea of positivism is critical to this understanding in that this idea of science as infallible and *objective* allows Western knowledge to be held up as truth while simultaneously identifying it "as the fiduciary of all knowledge with authority to authenticate or invalidate other knowledge" (Doxtater, 2005, p. 618).

Objectivity implies that the researcher is entirely detached from the "subject," allowing them to produce knowledge untainted by opinion or emotion. However, it is important to acknowledge that "academic processes of knowledge production are not insulated from the interests of the researcher," nor should it be (Brem-Wilson, 2014, p. 115). It is not only *hard* to be objective about instances of IEV like the FWC, it is *impossible*. I am certainly not objective about the FWC—I am biased in that I believe the crisis constitutes a genocide against Flint residents. My knowledge about the crisis—which is not expert—is situated within this bias:

> Our interpretations of reality – if we are good researchers – are not arbitrary, but neither are they universal or uncontested. "Owning" our own analyses in this sense is the first step away from positioning ourselves as having a uniquely authoritative understanding of reality. (Cox & Fominaya, 2009, p. 11)

The knowledge produced by social movements is likewise not objective, nor does it pretend to be. This is part of why it is seen as illegitimate by traditional academic processes. Despite this, it is these very subjective forms of knowledge that are critical to addressing sustainability and environmental justice problems. Carpenter et al. (2013) argue that "experiential reality is the starting point for any feminist or anti-racist inquiry and theorization into the constitution of social relations and everyday life," and I contend that this extends to sustainability and environmental justice—both of which can and

should be feminist/anti-racist in nature by incorporating social justice praxis at all stages (Carpenter, Ritchie, & Mojab, 2013, p. 6). Furthermore, I contend that this is absolutely critical to combat the "Eurocentric universalism in the idea that we are all part of the same homogeneous struggle and white people at the heart of the Empire can tell people of color and people in the (neo)colonies the best way to resist," an idea central to the expert focus in sustainability (Gelderloos, 2007, p. 22).

Freire (1970) offers an alternative to traditional Western colonial academic models of producing knowledge that "consists in acts of cognition, not transferals of information" (Freire, 1970, p. 79). In this model, learning and knowing becomes shared experiences between the "researcher" and the "subject," to use derivative sustainability language. Knowledge production thus becomes the practice of freedom, denying "that man is abstract, isolated, independent, and unattached to the world; it also denies that the world exists as a reality apart from people" (Freire, 1970, p. 81). Freire discusses this within the dialectic structure of the *oppressed* and the *oppressor*, a structure that allows for a critical understanding of the underlying factors that lead to unsustainability and environmental injustice:

> Who are better prepared than the oppressed to understand the terrible significance of an oppressive society? Who suffers the effects of oppression more than the oppressed? Who can better understand the necessity of liberation? (Freire, 1970, p. 45)

The knowledge produced by the oppressed does not have a place in sustainability discourse, in part because that knowledge directly challenges the corporate and institutional power that sustainability increasingly finds itself in bed with, such as the aforementioned Kochs and Waltons:

> [The oppressed] produce knowledge from below, information about society which is inconvenient to and resisted by those above: the wealthy, the mighty and the

> learned (or, as we might say, states, corporations and disciplines). A crucial aspect of movement practice is making known that which others would prefer to keep from public view, be that practices of torture and extra-judicial executions, the effects of individual pollutants and the costs of global warming, levels of rape and sexual abuse, the facts of poverty and exploitation, caste oppression and racism – the list is long. On a larger scale, movements highlight new ways of seeing the world: in terms of class or patriarchy, of colonisation or neo-liberalism, of ecology and human rights. (Cox & Fominaya, 2009, p. 1)

Chesters (2012) takes this a step further in asserting that it is in the interest of sustainability to include these non-academic forms of knowledge for the simple reason that "civil society and social movements are frequently at the forefront of knowledge generation about potential crises in human/ecological systems and can be conceived as critical sensors of systems moving from the edge of chaos towards more profound societal and environmental change" (Chesters, 2012, p. 146). Perhaps nowhere is this clearer in the case of the FWC, in which the residents of Flint should have acted as this critical sensor when they brought their concerns about water quality to the attention of the local and state governments.

The role that these institutional bodies played—and continue to play—in producing and disseminating knowledge is significant and not limited to sustainability or environmental justice. When Michael Brown was murdered on August 9, 2014, his community reacted immediately; there was video of his body lying in the streets posted to Twitter within minutes under the hashtag #BlackLivesMatter. This hashtag

> and the subsequent movement were created in 2013 by Black Activists Alicia Garza, Patrisse Cullors, and Opal Tometi in response to the acquittal of George Zimmerman for the shooting of Trayvon Martin; a Black 17-year-old in early 2012. (Brown, 2017, p. 33)

Since Zimmerman's acquittal, the Black Lives Matter (BLM) movement has grown exponentially, challenging racism and police/state violence across the country and around the world.

I bring up Michael Brown's murder because the videos posted directly contradicted the story provided by the police who murdered him. When young Black and brown children are murdered by police, the average person turns to the police for the story; there is an assumption that the police, a government agency, produce knowledge that is essentially infallible. Footage of Michael Brown's murder was not the first challenge to this notion, but it has certainly proven to be one of the most significant. There is a growing resistance to the prescribed infallibility of knowledge produced and disseminated by the police, which is clear in the growth of the #BlackLivesMatter movement and organizations like Cop Watch—a national grassroots movement to film the police. Both #BlackLivesMatter and Cop Watch are challenging police knowledge and narrative with knowledge of their own. This has been attributed—in part—to the use of Twitter by activists as a tool for disseminating knowledge. This allows for new types of knowledge to be shared and developed among communities without having to rely on traditional knowledge dissemination strategies that tend to rely on the news media.

The Black Lives Matter movement is a response to the immediate and deadly threat of police/state violence against Black and brown bodies that seeks to address immediate harms while working towards the transformation of the criminal in/justice system in the United States. Many activists cited the FWC as an instance of state violence against Black and brown bodies, using #BlackLivesMatter when discussing Flint on Twitter. The Black Lives Matter movement was extremely vocal during the FWC and remains vocal about the crisis to this day. While it is unrealistic to speculate what kind of affect this had, I do believe that the FWC remains in the collective consciousness of activists in part because of the use of tactics and rhetoric employed by Black Lives

Matter. A critical element of Black Lives Matter is the emphasis on transformation of institutions; to explore this, I turn to the idea of Transformative Justice.

TRANSFORMATIONAL JUSTICE

Sustainability has gained considerable power over the last two decades through its partnership/complicity with corporate, institutional, and political interests. However, in doing so, sustainability as a discourse has left behind the radical transformational rhetoric it claimed to espouse when it first began to address the issue of climate change. Agyeman (2008) asserts that in order to regain this transformational rhetoric, sustainability must adopt a vision of environmental justice:

> If sustainability is to become a process with the power to *transform,* as opposed to its current *environmental, stewardship* or *reform* focus, justice and equity issues need to be incorporated in its very core. Our present 'green' or 'environmental' orientation of sustainability is basically about tweaking our existing policies. Transformative sustainability or just sustainability implies a paradigm shift that in turn requires that sustainability takes on a redistributive function. To do this, justice and equity must move centre stage in sustainability discourses, if we are to have any chance of a more sustainable future. (Agyeman, 2008, p. 752)

While this is certainly a critical first step, I contend that truly transformational change—the kind of change demanded by the wicked problems posed by sustainability—can only be achieved through the inclusion of even more radical theories of justice. Audre Lorde (1984) famously said that "survival is not an academic skill" (Lorde, 1984, p. 2). This means that in order to survive these wicked problems, we must look outside of academia to the wide pools of knowledge developed by those who are immediately impacted. Sajnani et al. (2012) contend that in order to do this, we must

> avoid the saviour approach – you are not there to 'save' anyone! There is a difference between charity and solidarity. A charity lens can imply drawing a line between 'the haves and the have nots' or/and 'the knowledgeable and the ignorant.' While when working in solidarity with communities, there is no one 'to be saved'; knowledge is shared in a collective sense where we facilitate learning with each other. (Sajnani et al., 2012, p. 45)

This must be true for the entirety of the process, which extends to how IEV is addressed.

Kershnar et al. (2007) assert that "the most common response to violence is collusion—knowing violence is happening and allowing it to happen" (Kershnar et al., 2007, p. 6). In order to address IEV, it is imperative that we incorporate methods of violence prevention and reduction, which is why I turn to the idea of *transformative justice*. Transformative justice (TJ) emerged as a way to address child sexual assault in a way that addresses immediate harm while tackling systemic issues so as to prevent future harm. GenerationFIVE (2017) defines TJ as "an approach for how we—as individuals, families, communities, and society—can prevent, respond to, and transform the harms that we see happening in our world" (GenerationFIVE, 2017, p. 37). A big part of TJ is the idea of capacity building, allowing communities to respond to violence internally rather than rely on government or private institutions (Kershnar et al., 2007, p. 5). Kershnar et al. (2007) describe this as a liberatory approach to violence, which "seeks safety and accountability without relying on alienation, punishment, or State or systemic violence, including incarceration and policing" (Kershnar et al., 2007, p. 5). This is central to the idea of TJ, which emerged as an alternative to reliance on state systems, which Kershnar et al. (2007) argue perpetuates violence rather than solving it.

TJ is revolutionary in that it focuses specifically on changing the conditions that allow violence to continue. Furthermore, it does this through a collaborative solidarity that relies on and centers the knowledge of those immediately impacted rather than "experts." A primary goal of TJ is *safety*, which GenerationFIVE (2017) defines not as "a state to arrive at, but a dynamic set of questions, choices, and skills that allow each of us to exercise agency" (GenerationFIVE, 2017, p. 39). When we talk about problems in

sustainability, we talk about addressing them with *solutions*. The rhetoric of solutions is unrealistic in the context of IEV because of the implication of finality or completion; a solution *fixes* a problem, but there is no *fixing* Flint in this sense. Flint can be transformed, which is clear in the progress made by local activist groups and movements, but it is naïve to assume any kind of solution can fix the FWC. Likewise, it is naïve and *arrogant* to assume that I, a graduate student from Arizona, have the unique knowledge and education to *solve* the FWC.

Throughout this thesis, I have argued that sustainability and environmental justice, particularly in academia, are ill-equipped to handle the wicked problems posed by large-scale threats like climate change. What I have not done is offer a solution or a methodology for incorporating IEV. This is a critical next step, and one that must be taken by an activist with experience with IEV. In many ways, this thesis was a personal exploration to understand what my role is and should be in the fight for sustainability/environmental justice, and in searching for those answers I relied heavily on the work of activists. Engaging with community protest groups produces a type of knowledge unattainable in academia, something I have learned firsthand at actions. It is because of this that I contend that the logical next step of my "research" is to take a step back from academia. If I am to produce a methodology for incorporating IEV, I must do so with my comrades in the streets, and I encourage my peers to do the same to the extent that they are able. I recognize that not all research can or should take this path, but I believe that the problems posed by IEV are significant and immediate in a way that demands that my own personal research must.

The following is a non-comprehensive list of organizations doing real-time work on the ground to address IEV:

Table 1. *Organizations Addressing IEV*

Organization	Location
Flint Rising	Flint, MI
Extinction Rebellion	International
Sunrise Movement	U.S.
The Movement for Black Lives	U.S./International
Indigenous Environmental Network	U.S./International
Honor the Earth	U.S./International
Earth First!	International
UndocuFund	Sonoma County, CA
Cooperation Jackson	Jackson, MS
Trans Disaster Relief Fund	Huston, TX
Got Green	Seattle, WA
Center on Race, Poverty, and the Environment	U.S.

Notes: (Cooperation Jackson, 2014; CRPE, 2016; Earth First!, 1979; Extinction Rebellion, 2019; Flint Rising, 2016; Got Green, 2016; Honor The Earth, 1993; Indigenous Environmental Network, 2018; Sunrise., 2019; The Movement for Black Lives, 2015; Transgender Foundation of America, 2017; UndocuFund, 2018)

Adams, D. (2014, June 1). Flint Monthly Water and Sewer Bill Highest in Genesee County by $35. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/06/post_386.html

Agyeman, J. (2005). *Sustainable Communities and the Challenge of Environmental Justice*. NYU Press.

Agyeman, J. (2008). Toward a "Just" Sustainability? *Continuum: Journal of Media & Cultural Studies*, *22*(6), 751–756. https://doi.org/10.1080/10304310802452487

Agyeman, J., Bullard, R. D., & Evans, B. (2002). Exploring the Nexus: Bringing Together Sustainability, Environmental Justice and Equity. *Space & Polity*, *6*(1), 77–90. https://doi.org/10.1080/1356257022013790

Agyeman, J., & Evans, B. (2004). "Just sustainability": The emerging discourse of environmental justice in Britain? *Geographical Journal*, *170*(2), 155–164. https://doi.org/10.1111/j.0016-7398.2004.00117.x

Agyeman, J., & Evans, T. (2003). Toward Just Sustainability in Urban Communities: Building Equity Rights with Sustainable Solutions. *Annals of the American Academy of Political and Social Science*, *590*(November), 35–53. https://doi.org/10.1177/0002716203256565

Alexander, M. (2012). *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. The New Press.

Alkon, A. H., & Agyeman, J. (2011). *Cultivating Food Justice : Race, Class, and Sustainability*. MIT Press.

Ascher, W. (2007). Policy Sciences Contributions to Analysis to Promote Sustainability. *Sustainability Science*, *2*, 141–149. https://doi.org/10.1007/s11625-007-0031-z

Batie, S. (2008). Wicked Problems and Applied Economics. *American Journal of Agricultural Economics*, *90*(5), 1176–1191. https://doi.org/10.1111/j.1467-8276.2008.01202.x

Baum, R., Bartram, J., & Hrudey, S. (2016). The Flint Water Crisis Confirms That U.S. Drinking Water Needs Improved Risk Management. *Environmental Science & Technology*, *50*(11), 5436–5437. https://doi.org/10.1021/acs.est.6b02238

Benessia, A., Funtowicz, S., Bradshaw, G., Ferri, F., Ráez-Luna, E. F., & Medina, C. P. (2012). Hybridizing Sustainability: Towards a New Praxis for the Present Human Predicament. *Sustainability Science*, *7*, 75–89. https://doi.org/10.1007/s11625-011-0150-4

BlckGirlsMatter. (2016, January 18). "#TamirRice's murder and the deadly effects of the

#Flint #lead water are ALL connected as gratuitous violence against Black communities". *Twitter Post*. Retrieved from https://twitter.com/BlckGirlsMatter/status/689253094626955265

Blum, E. D. (2008). *Love Canal revisited : race, class, and gender in environmental activism*. University Press of Kansas. Retrieved from https://books.google.com/books/about/Love_Canal_Revisited_Race_Class_and_Gend.html?id=ZDkSAQAAIAAJ&source=kp_book_description

Braz, R., & Gilmore, C. (2006). Joining Forces: Prisons and Environmental Justice in Recent California Organizing. *Radical History Review*, (96), 95–111. https://doi.org/10.1215/01636545-2006-006

Brem-Wilson, J. (2014). From "Here" to "There": Social Movements, the Academy and Solidarity Research. *Socialist Studies/Études Socialistes*, *10*(1), 111–132.

Brown, A. M. (2017). *Steps Toward Cognitive Liberation: An Exploration of Black Lives Matter on Twitter*. University of Nebraska. Retrieved from http://files/1368/Steps_toward_Cognitive_Liberat.pdf

Bullard, R. D. (1993). Race and Environmental Justice in the United States. *Yale Journal of International Law*, *18*(1), 319–335.

Butler, L. J., Scammell, M. K., & Benson, E. B. (2016). The Flint, Michigan, Water Crisis: A Case Study in Regulatory Failure and Environmental Injustice. *Environmental Justice*, *9*(4), 93–97. https://doi.org/10.1089/env.2016.0014

Carlson, C. (2017). *The Emergence of the Field of Sustainability Science: Influences on Faculty Behavior Related to Sustainability Work*. University of Minnesota. Retrieved from http://files/1292/The Emergence of the Field of Sustainability Science- Influences on Faculty Behavior Related to Sustainability Work .pdf

Carpenter, S., Ritchie, G., & Mojab, S. (2013). The Dialectics of Praxis. *Socialist Studies / Études Socialistes*, *9*(1), 1–17.

Carrasco, E. R. (2002). Critical Race Theory and Post-Colonial Development: Radically Monitoring the World Bank and the IMF. In *Crossroads, Directions and A New Critical Race Theory* (pp. 366–375). Temple University Press.

Casas-Cortes, M. I., Osterweil, M., & Powell, D. E. (2008). Blurring Boundaries: Recognizing Knowledge-Practices in the Study of Social Movements. *Anthropological Quarterly*, *81*(1), 17–58.

Checker, M. (2011). Wiped Out by the "Greenwave": Environmental Gentrification and the Paradoxical Politics of Urban Sustainability. *City & Society*, *23*(2), 210–229. https://doi.org/10.1111/j.1548-744X.2011.01063.x

Chesters, G. (2012). Social Movement Studies: Journal of Knowledge Production Social

Movements and the Ethics of Knowledge Production. *Social Movement Studies*, *11*(2), 145–160. https://doi.org/10.1080/14742837.2012.664894

Clark, W. C., & Dickson, N. M. (2003). Sustainability Science: The Emerging Research Program. *Proceedings of the National Academy of Sciences of the United States of America*, *100*(14), 8059–8061. https://doi.org/10.1073/pnas.1231333100

Coats, T.-N. (2014). The Case for Reparations. Retrieved February 27, 2019, from https://www.theatlantic.com/magazine/archive/2014/06/the-case-for-reparations/361631/

Cooperation Jackson. (2014). Cooperation Jackson. Retrieved April 17, 2019, from https://cooperationjackson.org/

Corburn, J. (2005). *Street Science: Community Knowledge and Environmental Health Justice*. MIT Press.

Cox, L., & Fominaya, C. F. (2009). Movement Knowledge: What Do We Know, How Do We Create Knowledge and What Do We Do With it? *Interface: A Journal for and About Social Movements*, *1*(1), 1–20.

CRPE. (2016). The Center on Race, Poverty & The Environment – Community Health, Community Power, Community Resistance. Retrieved April 17, 2019, from https://crpe-ej.org/en/

DataCenter, & First Wednesdays Planning Committee. (2009). Power Analysis: Types and Sources of Power. In *First Wednesday Series: Sharing Leadership in Our Organizations* (pp. 949–955).

Dedeurwaerdere, T. (2018). From ecological psychology to four varieties of post-positivism in transdisciplinary science: Comment on "Contributions to Brunswik's Theory of Probabilistic functionalism". *Environment Systems and Decisions*, *38*(1), 79–83. https://doi.org/10.1007/s10669-017-9663-4

Dei, G. J. S. (2016). Decolonizing the University: The challenges and possibilities of inclusive education. *Socialist Studies/Études Socialistes*, *11*(1), 23–61.

Denno, D. (1993). Considering Lead Poisoning as a Criminal Defense. *Fordham Urban Law Journal*, *20*(3), 377. https://doi.org/10.2139/ssrn.1140225

Dernbach, J. C., Salkin, P. E., & Brown, D. A. (2012). Sustainability as a Means of Improving Environmental Justice. *J. of Sustainability and Envtl. Law*, *19*(1), 1–34.

Dobson, A. (1999). *Fairness and futurity : essays on environmental sustainability and social justice*. Oxford University Press.

Downing, T. E., Bakker, K., Lonsdale, K., Summerton, N., Swyngedouw, E., Giansante, C., … Wokaun, A. (2003). Expert stakeholder participation in the Thames region. In

B. Kasemir, J. Jäger, C. C. Jaeger, & M. T. Gardner (Eds.), *Public Participation in Sustainability Science* (pp. 187–200). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511490972.011

Doxtater, M. G. (2005). Indigenous Knowledge in the Decolonial Era. *The American Indian Quarterly*, *28*(3), 618–633. https://doi.org/10.1353/aiq.2004.0094

Dunbar-Ortiz, R. (2014). *An Indigenous Peoples' History of the United States*. Beacon Press.

Durokifa, A. A., & Ijeoma, E. C. (2018). Neo-colonialism and Millennium Development Goals (MDGs) in Africa: A blend of an old wine in a new bottle. *African Journal of Science, Technology, Innovation and Development*, *10*(3), 355–366. https://doi.org/10.1080/20421338.2018.1463654

Earth First! (1979). Earth First! Retrieved April 17, 2019, from http://www.earthfirst.org/

Edelstein, M. R. (2000). "Outsiders Just Don't Understand": Personalization of Risk and the Boundary Between Modernity and Postmodernity. In *Risk in the Modern Age: Social Theory, Science, and Environmental Decision-Making* (pp. 123–143). Anglo-German Foundation for the Study of Industrial Society.

Edwards, M., Roy, S., Rhoads, W., Parks, J., & Mantha, A. (2015). Lead Testing Results for Water Sampled by Residents | Flint Water Study Updates. Retrieved March 20, 2019, from http://flintwaterstudy.org/information-for-flint-residents/results-for-citizen-testing-for-lead-300-kits/

Emery, A. (2015, August 28). Concerned Pastors Announce Water Filter Giveaway in Flint Next Week. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2015/08/concerned_pastors_announce_wat.html

Extinction Rebellion. (2019). Extinction Rebellion. Retrieved April 17, 2019, from https://rebellion.earth/

Fanon, F. (1963). *The Wretched of the Earth*. Grove Weidenfeld. https://doi.org/10.1016/j.spsy.2013.04.012

Farley, H. M. (2013). *Interpreting Sustainability: An Analysis of Sustainable Development Narratives Among Developed Nations*. Northern Arizona University.

Feagin, J. R. (1999). Excluding Blacks and Others From Housing: The Foundation of White Racism. *Cityscape*, *4*(3), 79–91. https://doi.org/10.2307/20868476

Ferguson, R. A. (2004). *Aberrations in black : toward a queer of color critique*. University of Minnesota Press.

Flint Rising. (2016). Flint Rising. Retrieved April 17, 2019, from http://flintrising.com/about/

Flint Water Advisory Task Force. (2016). *Flint Water Advisory Task Force Final Report*. Flint, MI.

Fonger, R. (2014a, August 2). Flint Councilman Wantwaz Davis Plans Third March on City Hall to Protest Water Rates. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/08/flint_councilman_wantwaz_davis_1.html

Fonger, R. (2014b, October 13). General Motors Shutting of Flint River Water at Engine Plant Over Corrosion Worries. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/10/general_motors_wont_use_flint.html

Fonger, R. (2014c, October 14). GM's Decision to Stop Using Flint River Water Will Cost Flint $400,000 Per Year. *Flint Journal*.

Fonger, R. (2015a, February 5). Flint Pastors Tell State Officials: Get Us Off Flint River Water Now. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2015/02/flint_pastors_tell_state_offic.html

Fonger, R. (2015b, March 6). Flint Emergency Manager Says Rates Might Jump 30 Percent Higher With Detroit Water. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2015/03/flint_emergency_manager_says_3.html

Fonger, R. (2018, September 17). Prosecutors Search Cellphone for Evidence Blood Lead Data was Falsified in Flint. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2018/09/woman_who_says_she_was_told_to.html

Ford, C. L., & Airhihenbuwa, C. O. (2010). Critical Race Theory, Race Equity, and Public Health: Toward Antiracism Praxis. *American Journal of Public Health*, *100*(SUPPL. 1), 693–698. https://doi.org/10.2105/AJPH.2009.171058

Freire, P. (1970). *Pedagogy of the oppressed*. Penguin Books.

Gallagher, C. A. (2003). Color-Blind Privilege: The Social and Political Functions of Erasing the Color Line in Post Race America. *Race, Gender & Class*, *10*(4), 1–17. https://doi.org/10.1017/CBO9781107415324.004

Gelderloos, P. (2007). *How Nonviolence Protects the State*. The Anarchist Library.

GenerationFIVE. (2017). *Ending Child Sexual Abuse: A Transformative Justice Handbook*. GenerationFIVE.

Gibbs, L. (2002). Citizen Activism for Environmental Health: The Growth of a Powerful New Grassroots Health Movement. *Annals of the American Academy of Political & Social Science*, *584*, 97–109. https://doi.org/10.1177/000271602237430

Glenn, E. N. (2015). Settler Colonialism as Structure: A Framework for Comparative

Studies of U.S. Race and Gender Formation. *Sociology of Race and Ethnicity*, *1*(1), 52–72. https://doi.org/10.1177/2332649214560440

Gonzalez, C. G. (2015). Environmental Justice, Human Rights, and the Global South. *Santa Clara Journal of International Law*, *13*, 151–195.

Got Green. (2016). Got Green. Retrieved April 17, 2019, from http://gotgreenseattle.org/home/what-we-do/#overview

Haas, W., Martinez-Alier, J., Bene, D. Del, Demaria, F., Bond, P., Rijnhout, L., … Porto, M. (2018). Between activism and science: grassroots concepts for sustainability coined by Environmental Justice Organizations. *Journal of Political Ecology*, *21*(1), 19. https://doi.org/10.2458/v21i1.21124

Hanna-Attisha, M. (2017). *What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City*. Random House Publishing Group.

Hart, D. D., & Bell, K. P. (2013). Sustainability Science: A Call to Collaborative Action. *Agricultural and Resource Economics Review*, *42*(1), 75–89. https://doi.org/10.1017/S1068280500007620

Healy, C., & Bernstein, J. (2016). Legal and Policy Interventions to Address Developmental and Mental Health Impacts of the Flint Water Crisis. *Environmental Justice*, *9*(6), 167–175. https://doi.org/10.1089/env.2016.0034

Highsmith, A. R. (2009). *Demolition Means Progress: Race, Class, and the Deconstruction of the American Dream in Flint, Michigan (Volume 1)*. University of Michigan. https://doi.org/10.2174/138920312803582960

Honor The Earth. (1993). Honor The Earth. Retrieved April 17, 2019, from http://www.honorearth.org/

Howieson, W. B., Burnes, B., & Summers, J. C. (2019). Organisational leadership and/for sustainability: Future directions from John Dewey and social movements. *European Management Journal*, (xxxx). https://doi.org/10.1016/j.emj.2019.02.003

Indigenous Environmental Network. (2018). Indigenous Environmental Network. Retrieved April 17, 2019, from http://www.ienearth.org/

Jackson, D. Z. (2017). Environmental Justice? Unjust Coverage of the Flint Water Crisis. Retrieved from https://shorensteincenter.org/environmental-justice-unjust-coverage-of-the-flint-water-crisis/#Residents_and_Local_Media_Sound_the_Alarm

Jonesj1107Jones. (2015, January 21). "After all that has happened to Flint and its residents the last thing we need is to be poisoned by our water. And charged 100$ before a drop." *Twitter Post*.

Käkönen, J. (1975). The World Bank: A Bridgehead of Imperialism. *Instant Research on*

Peace and Violence, *5*(3), 150–164.

Kates, R. W., Clark, W. C., Corell, R., Hall, J. M., & Jaeger, C. C. (2001). Sustainability Science. *Science*, *292*(5517), 641–642. https://doi.org/10.1126/science.1059386

Kauffman, J. (2009). Advancing sustainability science: Report on the International Conference on Sustainability Science (ICSS) 2009. *Sustainability Science*, *4*(2), 233–242. https://doi.org/10.1007/s11625-009-0088-y

Kelly, A. (2003). *Nonviolent Community Safety and Peacebuilding*.

Kershnar, S., Haines, S., Harkins, G., Greig, A., Wiesner, C., Levy, M., … Carr, J. (2007). *Toward Transformative Justice: A Liberatory Approach to Child Sexual Abuse and Other Forms of Intimate and Community Violence*. GenerationFIVE.

Ketchum III, W. E. (2015, February 14). People Take to Streets to Protest Flint Water Quality. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2015/02/flint_residents_protest_citys.html

Komiyama, H., & Takeuchi, K. (2006). Sustainability Science: Building a New Discipline. *Sustainability Science*, *1*(1), 1–6. https://doi.org/10.1007/s11625-006-0007-4

Ladyy_A2Real. (2014, June 1). "Bro.. I'm thirsty af. I want some water but I refuse to drink that Flint River shit." *Twitter Post*. Retrieved from https://twitter.com/Ladyy_A2Real/status/473314525350215681

Lipsitz, G. (2009). *The Possessive Investment in Whiteness: How White People Profit from Identity Politics, Revised and Expanded Edition*. https://doi.org/10.1017/CBO9781107415324.004

Lorde, A. (1984). The Master's Tools Will Never Dismantle the Master's House. In *Sister Outsider: Essays and Speeches by Audre Lorde*. https://doi.org/10.1177/0959353598081006

LOVEVsLoyalty. (2014, May 25). "Flint water is the Flint river water. y'all nastyyyy." *Twitter Post*. Retrieved from https://twitter.com/LOVEVsLoyalty_/status/470597737961226240

Lynch, J. (2014, September 8). Letter: Is Flint Drinking Water Really Safe to Drink? *Flint Journal*. Retrieved from http://www.mlive.com/opinion/flint/

Macias, T. (2016). Environmental risk perception among race and ethnic groups in the United States. *Ethnicities*, *16*(1), 111–129. https://doi.org/10.1177/1468796815575382

Mares, T. M., & Peña, D. G. (2011). Environmental and Food Justice: Toward Local, Slow, and Deep Food Systems. In *Cultivating Food Justice: Race, Class, and*

Sustainability (pp. 197–220). Retrieved from http://www.jstor.org/stable/j.ctt5vjpc1.13

Massey, R. (2004). *Environmental Justice: Income, Race, and Health*. Retrieved from http://ase.tufts.edu/gdae

Mawuko-Yevugah, L. C. (2010). *Governing Through Developmentality: The Politics of International Aid Reform and the (Re)production of Power, Neoliberalism and Neocolonial Interventions in Ghana*. University of Alberta.

Mccannr1. (2015, October 8). "Each speaker has said 'top priority' is health of Flint residents. Guess that's why they sat on this for a year white kids drank poison water". *Twitter Post*.

Merqwanda. (2014, April 24). "So they're gonna start using the flint river for drinking water..... Nah." *Twitter Post*. Retrieved from https://twitter.com/merqwanda/status/459452845922979840

Miller, T. R., Wiek, A., Sarewitz, D., Robinson, J., Olsson, L., Kriebel, D., & Loorbach, D. (2014a). The Future of Sustainability Science: A Solutions-Oriented Research Agenda. *Sustainability Science*, *9*(2), 239–246. https://doi.org/10.1007/s11625-013-0224-6

Miller, T. R., Wiek, A., Sarewitz, D., Robinson, J., Olsson, L., Kriebel, D., & Loorbach, D. (2014b). The Future of Sustainability Science: A Solutions-Oriented Research Agenda. *Sustainability Science*, *9*(2), 239–246. https://doi.org/10.1007/s11625-013-0224-6

Moore, M. (2018). *Fahrenheit 11/9*. Dog Eat Dog Films.

Morckel, V. (2017a). Using suitability analysis to select and prioritize naturalization efforts in legacy cities: An example from Flint, Michigan. *Urban Forestry & Urban Greening*, *27*(July 2016), 343–351. https://doi.org/10.1016/j.ufug.2017.09.006

Morckel, V. (2017b). Why the Flint, Michigan, USA Water Crisis is an Urban Planning Failure. *Cities*, *62*, 23–27. https://doi.org/10.1016/j.cities.2016.12.002

Muhammad, M., Loney, E. H. De, Brooks, C. L., Assari, S., Robinson, D., & Caldwell, C. H. (2018). " I think that's all a lie … I think It' s genocide": Applying a Critical Race Praxis to Youth Perceptions of Flint Water Contamination. *Ethnicity & Disease*, *28*, 241–246. https://doi.org/10.18865/ed.28.S1.241.Keywords

Needleman, H. L., McFarland, C., Ness, R. B., Fienberg, S. E., & Tobin, M. J. (2002). Bone Lead Levels in Adjudicated Delinquents: A Case Control Study. *Neurotoxicology and Teratology*, *24*, 711–717. https://doi.org/10.1016/S0892-0362(02)00269-6

Nevin, R. (2000). How Lead Exposure Relates to Temporal Changes in IQ, Violent

Crime, and Unwed Pregnancy. *Environmental Research*, *83*, 1–22. https://doi.org/10.1006/enrs.1999.4045

Nordhaus, T., & Shellenberger, M. (2005). The death of environmentalism: Global warming politics in a post-environmental world | Grist. Retrieved February 26, 2019, from https://grist.org/article/doe-reprint/

Omi, M., & Winant, H. (2015). *Racial formation in the United States*. Routledge.

Patel, L. (2016). Pedagogies of Resistance and Survivance: Learning as Marronage. *Equity and Excellence in Education*, *49*(4), 397–401. https://doi.org/10.1080/10665684.2016.1227585

Pieper, K. J., Tang, M., & Edwards, M. A. (2017). Flint Water Crisis Caused By Interrupted Corrosion Control: Investigating "Ground Zero" Home. *Environmental Science & Technology*, *51*(4), 2007–2014. https://doi.org/10.1021/acs.est.6b04034

PsychoSloth. (2015, October 19). "Literally, the US EPA just got caught covering up themselves because they POISONED the water in Flint, MI. Kids drink that water, man." *Twitter Post*.

Pulido, L. (2017). Geographies of Race and Ethnicity II: Environmental Racism, Racial Capitalism and State-Sanctioned Violence. *Progress in Human Geography*, *42*(2), 309–318. https://doi.org/10.1177/0309132516686011

Rebecca Solnit. (2014). Call Climate Change What it is: Violence. *Charter for Compassion*. Retrieved from https://charterforcompassion.org/compassion-environment-reader/the-story-of-solutions/call-climate-change-what-it-is-violence

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., … Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*, *90*(5), 1933–1949. https://doi.org/10.1016/j.jenvman.2009.01.001

Renn, O., Burns, W. J., Kasperson, R. E., Kasperson, J. X., & Slovic, P. (1992). The Social Amplification of Risk: Theoretical Foundations and Empirical Applications. *Journal of Social Issues*, *48*(4), 137–160. https://doi.org/10.1111/j.1540-4560.1992.tb01949.x

Roby, E. (2016). *Climate of Framing: Beyond Environmental Racism and Environmental Justice in a Neoliberal Context*. University at Buffalo, New York, NY.

ROWE, & Lockwood Andrews & Newman. (2011). *Analysis of the Flint River as a Permanent Water Supply for the City of Flint*. Flint, MI. Retrieved from http://www.greatlakeslaw.org/Flint/LAN_2011_Report_with_Appendices.pdf

Sadler, R. C., & Highsmith, A. R. (2016). Rethinking Tiebout: The Contribution of Political Fragmentation and Racial/Economic Segregation to the Flint Water Crisis.

Environmental Justice, *9*(5), 143–151. https://doi.org/10.1089/env.2016.0015

Sajnani, N., Muhungi, W. M., Yee, J., Mercer, K., Butler, K., Jones, L.-T., … Matining, M. (2012). *Decolonizing Social Justice Work: Stories to Support Organizations, Facilitators, and Youth Working Against Oppression*. Girls Action Foundation.

Schlosberg, D. (2013). Theorising environmental justice: the expanding sphere of a discourse. *Environmental Politics*, *22*(1), 37–55.

Schulz, A. J., Mentz, G. B., Sampson, N., Ward, M., Anderson, R., De Majo, R., … Wilkins, D. (2016). Race and the Distribution of Social and Physical Environmental Risk: A Case Example from the Detroit Metropolitan Area. *Du Bois Review*, *13*(2), 285–304. https://doi.org/10.1017/S1742058X16000163

Sharfstein, J. M. (2016). Banishing "Stakeholders," *94*(3), 476–479.

Stanley, E. A., & Smith, N. (2015). *Captive Genders: Trans Embodiment in the Prison Industrial Complex*. *Captive Genders: Trans Embodiment in the Prison Industrial Complex*. AK Press.

Sunrise. (2019). Sunrise Movement. Retrieved April 17, 2019, from https://www.sunrisemovement.org/

Tarlock, D. (2002). Who Owns Science? *Penn State Environmental Law Review*, *10*(2). https://doi.org/10.3868/s050-004-015-0003-8

The Movement for Black Lives. (2015). The Movement for Black Lives. Retrieved April 17, 2019, from https://policy.m4bl.org/

Transgender Foundation of America. (2017). The Trans Disaster Relief Fund. Retrieved April 17, 2019, from http://tdrfund.us/about-tfafund/

UndocuFund. (2018). UndocuFund – for Fire Relief in Sonoma County. Retrieved April 17, 2019, from http://undocufund.org/

Wamsler, C., Brossmann, J., Hendersson, H., Kristjansdottir, R., McDonald, C., & Scarampi, P. (2018). Mindfulness in sustainability science, practice, and teaching. *Sustainability Science*, *13*(1), 143–162. https://doi.org/10.1007/s11625-017-0428-2

Wang, T., Kim, J., & Whelton, A. J. (2019). Management of Plastic Bottle and Filter Waste During the Large-Scale Flint Michigan Lead Contaminated Drinking Water Incident. *Resources, Conservation and Recycling*, *140*(August 2018), 115–124. https://doi.org/10.1016/j.resconrec.2018.08.021

Wiek, A. (2015). *Solving Sustainability Problems: Tools for a New Generation of Professionals*. School of Sustainability, Arizona State University.

Wiek, A., Farioli, F., Fukushi, K., & Yarime, M. (2012). Sustainability science: Bridging

the gap between science and society. *Sustainability Science*, *7*(SUPPL. 1), 1–4. https://doi.org/10.1007/s11625-011-0154-0

Wiek, A., Ness, B., Schweizer-Ries, P., Brand, F. S., & Farioli, F. (2012). From complex systems analysis to transformational change: A comparative appraisal of sustainability science projects. *Sustainability Science*, *7*(SUPPL. 1), 5–24. https://doi.org/10.1007/s11625-011-0148-y

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, *6*(2), 203–218. https://doi.org/10.1007/s11625-011-0132-6

Wise, T. J. (2010). *Colorblind: The Rise of Post-Racial Politics and the Retreat From Racial Equity*. City Lights Books.

World Commission on Environment and Development. (1987). *Our Common Future*. Oxford University Press.

Yarime, M., Takeda, Y., & Kajikawa, Y. (2010). Towards institutional analysis of sustainability science: A quantitative examination of the patterns of research collaboration. *Sustainability Science*, *5*(1), 115–125. https://doi.org/10.1007/s11625-009-0090-4

Yarime, M., Trencher, G., Mino, T., Scholz, R. W., Olsson, L., Ness, B., … Rotmans, J. (2012). Establishing Sustainability Science in Higher Education Institutions: Towards an Integration of Academic Development, Institutionalization, and Stakeholder Collaborations. *Sustainability Science*, *7*(SUPPL. 1), 101–113. https://doi.org/10.1007/s11625-012-0157-5

Young, M. (2014a, September 15). Flint City Employee Arraigned on Charge Related to Residential Water Theft. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/09/city_employee_arraigned_accuse.html

Young, M. (2014b, September 17). Flint Officials Confirm “Massive” Water Theft Investigation, Crackdown. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/09/flint_officials_confirm_massiv.html

Young, M. (2014c, December 23). Case Dismissed Against Man Accused of Obstructing Flint Water Theft Investigation. *Flint Journal*. Retrieved from https://www.mlive.com/news/flint/2014/12/case_dismissed_against_man_acc.html

Zahran, S., McElmurry, S. P., & Sadler, R. C. (2017). Four Phases of the Flint Water Crisis: Evidence from Blood Lead Levels in Children. *Environmental Research*, *157*, 160–172. https://doi.org/10.1016/j.envres.2017.05.028