Talking About Water
Water Stories from Boston in a Time of Insecurity

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Abstract

This thesis explores water insecurity, or the idea of it, and examines uncertainty of water for household use both in terms of access and quality. Water is a vital resource for humans; nevertheless, it is one that is under pressure. This thesis examines perspectives on water security as gathered from research conducted in Boston, Massachusetts in the United States in fall 2018. It examines the ways in which an overheated and compressed system defines the intersection of water stories for those residing in Boston and engaging with the water system. The research suggests that water insecurity exists within what Eriksen has referred to as an *overheated world* and that this feeling of water insecurity increases with *excessive globalization* to which Eriksen (Eriksen 2016, 2013). This thesis will show that the water stories and water anxieties in Boston are not necessarily an effect of a lack of water access and water quality. People can have ample access to high quality water, enough to meet their needs but still feel anxious. It further suggests that the stories and understanding of the stressors are related to what Harvey has called "time-space compression" (Harvey 1990). This thesis thus argues that the water stories from Boston reflect an intersection of experiences wherein the overheated world and the time-space compression ultimately play out to inform understandings and interactions between the water system and people and their water use. The water stories I examine expand beyond the confines of the city of Boston. I show how mobility contextualizes the water stories people tell and how water stories from elsewhere define the experience of water in Boston. Lastly, the thesis engages concepts such as inequality and trust. Trust is not a completely simple idea as it inherently relates to issues of inequalities and inequities. People do not experience water insecurity in a similar way. It depends on where they are situated. However, relatively water secure people can still find it hard to trust a system that fails parts of the population, these failures adding to their own insecurity. As geographic and time scales clash water insecurity from elsewhere, becomes a felt experience even though from any objective standpoint individuals could be viewed as water secure.

Keywords: Water, United States, Boston, overheating, urban environment, insecurity, natural resources, local perspectives, sustainability, infrastructure, development

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Abbreviations

MA- Massachusetts/ Commonwealth of Massachusetts

US- United States/ United States of American

BWSC- Boston Water and Sewer Commission

MWRA- Massachusetts Water Resource Authority

EPA- Environmental Protection Agency

MBTA- Massachusetts Bay Transportation Authority (public transportation system)

DCR- Massachusetts Department of Conservation and Recreation

WHO- World Health Organization

NPR- National Public Radio

MIT- Massachusetts Institute of Technology

DAPL- Dakota Access Pipe Line

OECD- Organisation for Economic Co-operation and Development

UN- United Nations

UN OHCHR- Office of the United Nations High Commissioner for Human Rights

"Water: can't live without it" – *Brigid, South Boston Resident*

1   Talking about water: An Introduction and Literature Review

1.1   Diving in

Water is a vital part of the larger world in which humans live. From its chemical structure to the watersheds through which it flows, water is viewed through many different lenses. Nevertheless, water is particularly significant in its relation to humans as a resource that people both utilize and consume. People use water in agriculture, industry, and even in the production of energy. Water is also necessary for sustaining life and health of humans. This necessity comes specifically from the fact that drinking water is essential to be healthy and alive and because unclean water can cause illness and therefore be detrimental to health. Water also is important for sanitation, and poor sanitation is detrimental to human health.

With these connections to humans, availability of water becomes a matter of policy, law, rights, and international concern. Consequently, it becomes part of the infrastructure and planning of communities. While some frame water as a commodity to be traded, others consider it a public good to be shared and that should be provided by governments. Through this process of water provision and commercialization, people's perceptions of water and therefore how they treat it, changes. Indeed, our understanding of water relates to many other social and political issues. The human relationship with water can be complicated be it lacking or plentiful but potentially unusable.

One can imagine a situation in Oslo, Norway. You are at someone's apartment, and with a cup in hand, you walk towards the kitchen sink. Then the question is asked, "Can I drink straight from the tap?" More than once I have heard the now expected reply, "Of course, this is Norway!"

Living in a country like Norway, with a population of approximately 5.3 million (SSB 2018), there are certain assumptions about water: that it is safe and will easily flow from the taps. There is this expectation of its quality and presence; one might even take this for granted. Norway is a country that is abundant in water; indeed,

hydropower is a major source of electricity production in Norway (Norwegian Ministry of Petroleum and Energy, Berthelsen, and Nagell 2016, Statkraft 2019). Yet at the same time, the quality of the drinking water is also regarded highly, with National Institute of Health reporting that 90% of population has water evaluated by them (NIPH 2017). Moreover, Norway is an affluent country with large investments in the public sector; thus, it would make sense that there would be an expectation of quality in public works and infrastructure.

Norway is also defined by a set of borders, which mark this country and its administration as separate from others in Europe and across the world. Together these factors create a certain sense of security for the water consumer. Back in the Oslo apartment, often the asker of this question, myself included, has come from somewhere outside of Norway. Indeed, this sense of water security is not guaranteed everywhere in the world, even in parts of the United States.

In contrast, with a population of over 326 million people (U.S. Census Bureau 2018d), the United States faces a multitude of issues with relation to health, population safety, resource use, and water access. This project looks at how people in the Boston area reflect and talk about water in this larger context of water access, water quality, and scarcity. Water access includes having clean and safe water easily available in homes. This question of access and security occurs as some communities and populations in the United States are uniquely lacking the access in the presence of general availability. The water management in the United States is a complex system composed of different interacting scales of governance and management: from the federal, to the state, to regional, to the city. Indeed, each region has a separate way of managing water. Likewise, there are other contributing factors beyond these divisions such as regional climate and weather patterns.

However, since, the United States is one country, in theory, the water should meet a same standard as per the U. S. Clean Water Act of 1972 and the Safe Drinking Water Act of 1974 (US EPA 2013b, 2017). These are federal laws that govern and provide guidance about water quality and safety across the United States (US EPA 2013b, 2017). They are crucial documents as they put water protection into Federal law and the establishment of these laws was linked with the progression of the environmental movement of the 1960s and 1970s (Coglianese 2001). This moment in environmental

history is also notable with the chronological proximity to the federal formalization of other environmental protections with the creation of the Clean Air Act of 1970 and the formation of the Environmental Protection Agency (EPA) in 1970 (US EPA 2016, 2013a).

Overall, this thesis is concerned with a puzzle. When I conducted my fieldwork in Boston, Massachusetts, people talked about water. They were concerned about water and expressed feelings of being somewhat water insecure, although many were largely not, objectively speaking. People engaged with and thought about their water. They participated in civil organizations concerned with water security and water justice. They talked about their past access to water, present access to water, and insecurities about water access in the future. These are what I, in this thesis, call water stories.

Given my position in this research, I can to a degree relate to some of this felt insecurity, though similarly I was never without access. I grew up in an area of the United States just outside of Boston, Massachusetts. My childhood was full of water stories, and talks about water. I was told to be sure to drink the water out of the Brita pitcher (the filtered water). When I was a very young child, I recall drinking water, not out of the tap, but from the seemingly giant one gallon (3.8 liters) bottles. Talks were ingrained in practices such as not to drink the hot water that comes out of the tap, instead always heat up the cold water. In this sense, I can place myself as a researcher into the larger narrative as well as a lens of understanding.

1.1.1 Research Question

Water security in the United States is not always clear and guaranteed in practice. A component that can contribute to this lack of feeling of security, despite availability in some regions, comes from the recognition that this large country is connected. Within the United States, there is a large degree of mobility as people move and therefore, have different perspectives and points of understanding and feelings of water security. Thus, people living in Massachusetts, a state with a population of approximately 6.86 million, (U.S. Census Bureau 2017a) and the City of Boston, population of approximately 685,000 (U.S. Census Bureau 2018a) in particular, do not merely live in an isolated bubble in control of their own resources, but rather,

they are part of the larger system of the country and in some ways the world. As part of the larger system of the United States, the sense of security in water does not come without question. While one state or population may have adequate water it may not be so throughout the US. When there is water insecurity in one place, it can be felt elsewhere as well. Drilling down to a specific region, this thesis then asks:

How do people in the Boston area express, through water stories, a sense of insecurity, and how through the telling of water stories can one better understand the sense of water insecurity in Boston despite a relatively security situation?

Embedded in this question are questions of how Boston people experience water security across different scales?

1.2 The Process: Introductory Methods Explanation

Initially considering the Boston area, due to references of water insecurity drawn from existing research, I began field research in September 2018 (Georgetown Law Human Rights et al. 2013, Jones and Moulton 2016). Research was conducted in the Greater Boston area of the Commonwealth of Massachusetts, US. Here, I conducted a series of semi-structured interviews with both residents of Boston and water professionals: people who are working within the field of water and with water issues. As will be discussed more in depth later in the methodology chapter, this seemed an appropriate method for this kind of research, allowing for the gathering richer qualitative information than perhaps a survey would; therefore, these interviews could better illustrate the experience of the interviewees (Bryman 2016, 466-7). In order to find participants or informants to interview, I frequently employed the snowball method, such that people I reached out to and interviewed led me to other points of contact (Bryman 2016, 188, O'Leary 2017, 211). Interviews were conducted in on the phone and in person in various settings including cafes, homes, offices, a transit station, and seasonal fairs. While the aim of the interviews was not to create a strictly statistically representative sample, it was a diverse group with different life situations, and each person ultimately was a representative of themselves and their own experience. The analysis for this paper was largely drawn from the interview data which was sorted using coding and thematic analysis (Seale

2018). Other analysis included information from publicly available sources and government documentation. The project design and analytic structure have been strongly influenced by my interdisciplinary background, which includes Literature amongst several fields. Due to the interweaving complexity of water and my background, this thesis embraces the transdisciplinary approach wherein "boundaries between disciplinary knowledges" are "redraw[n] to fit the respective project or topic (Holifield, Chakraborty, and Walker 2018, 253). Thus, throughout the thesis, I draw from different disciplines to appropriately represent an understanding of water security in Boston.

1.3 **Aims, Objectives, and Rationale**

Following a structural argument based on Eriksen's *Overheating: An Anthropology of Accelerated Change,* this thesis will explore the experience of insecurity through the ideas of knowledge and information, mobility, and trust (Eriksen 2016). The aim of this research was to understand the experience involved with accessing drinking water for Boston residents in a time of larger water insecurity.

This research will provide critical analytic insights into the specific case of Boston's water access. As such, there are several objectives to this work. The first is to illustrate and explain a current experience of water for local residents, while understanding an intersection of experiences of both residents and administrators or professionals. Likewise, it is to further describe and explain the specific perspectives voiced by residents of Boston through interviews. In so doing, voices of potentially excluded groups can be described. The role of some water professionals, as learned through interviews and public document review, are also examined. Finally, overall this will produce a rigorous analysis of these collected perspectives, while incorporating theories of insecurity, compression, and globalization so as to interpret the data from the case study. Therefore, in summary, this thesis aims to understand how excessive globalization, in terms of increased mobility, information, and interactions, creates a sense of water insecurity for people in Boston.

This research is relevant and timely. There is a good deal of discussion about water issues generally in the United States with recent high profile cases and globally with the UN resolution identifying water access as a human right (UN-Water [2018]).

Therefore, this research in Boston on people's understandings of water access and security adds to an important field of study by providing an understanding of a sample of perceptions of water. This also adds nuance as it is a region with a history of recognizing water as a priority (Dolin 2004). Such a regional status of water could influence how people consider water both as something they use as well as water in the abstract. Moreover, this research has an added layer of personal relevance as it focuses on a place significant to my place of origin: Boston. The specific methods utilized help produce data, such that diverse voices are brought forth through interviews and there are many possibilities for this data collection.

Indeed, water access has been studied through different academic lenses and in different locations; however, this research examined a unique sample of people who provided their original, individualized insights into their relevant experience. With such a significant topic as water, going forward by adding to information on Boston area water and perspectives therein, there is the possibility of an impact on further water research, Boston research, and policy.

1.4 Water is Life

1.4.1 Understanding the Importance of Water

Water as a Field of Study

A variety of literature provides insights to questions of water access and security in the United States and follows several overlapping avenues. These avenues highlight the contributing stressors and concerns for water security.

The role of the infrastructural systems is one such consideration. Water and sanitation systems management is a field of study that has a large amount of existing framework literature and has been developing with modern technologies. This specific sub-field addresses the questions of: what is happening to the water that is being used and what are the literal physical processes that occur. There exists an abundance of studies on how the systems work and function overall (Bell et al. 2017, Smith 2013). There is also discussion of where and how there are issues within the infrastructural system such as issues of failing infrastructure or implications of

climate change (Fedinick et al. 2017, McNabb 2017). Analysis also links these systems with the policy connected to them (OECD 2011). Similarly, sources provide insights into sanitation and urban water use theories (Bell et al. 2017). These concepts of the physical systems and water management are particularly pertinent because this is where many issues arise in regards to basic access to water.

Water is also framed as a resource under conflict, and is thus frequently discussed in existing literature (Gunasekara et al. 2014). In this context, water, considered a resource, is valuated in relation to the idea of conflicts surrounding it. Water use specifically for commercial agriculture and during droughts, are other issues found amid the current discourse on water (Barnett 2011, 10). Indeed, the importance of water security as a concern for national security is documented by the US Department report on a need for a global water strategy (US Government and USAID 2017). Moreover, there are further concerns surrounding water use, quality, and ecosystems and thus a conflict with nature (Hunt 2013, 5-33).

Amongst the concern for water, is a general reflection on the current state of water. There have been numerous texts that consider the current state of water across the globe including: *Blue Revolution: Unmaking America's Water Crisis* (Barnett 2011)*, Thirsty Planet: Strategies for Sustainable Water Management* (Hunt 2013)*, Water in Plain Sight* (Schwartz 2016), *Water: Abundance, Scarcity, and Security in the Age of Humanity* (Schmidt 2017)*, Blue Covenant* (Barlow 2009), and many more. Of these texts for instance, in *Blue Covenant,* Barlow examines the shifting role of water, highlighting pressing concerns, policy measures, and different locations (Barlow 2009)*. The Last Drop: The Politics of Water* also points to the vital nature of water and the political interplay and existing concerns (Gonzalez and Yanes 2015)*.* There is also discussion of urban structures within the context of urban ecology (Grimm et al. 2008).

The sheer presence of this many reflections on and approaches to the general topic of the state of water indicates an underlying concern surrounding the role of water.

Water Insecurity

Massachusetts, the location of this research, is part of this larger system of insecurity. In addition, Massachusetts has had a history of issues surrounding water. It is one

state amongst 50 in the United States, so what occurs elsewhere connects to it with policy, individual experience, identity, physical resources, and many more links. Massachusetts is water abundant and somewhat more affluent than some other states but still diverse and near the coast, factors that can have an influence on water insecurity (U.S. Geological Survey 2012, Boston Planning & Development Agency, City of Boston, U.S. Census Bureau: 2006-2010 American Community Survey, et al. 2019). However, a discrete sense of insecurity in Boston and Massachusetts can also be understood within recent memory, where serious cases of water pollution posed a threat to public health and safety within many people's lives. Boston is the capital and largest city in Massachusetts and thus a focal point for study.

Massachusetts is an older state, which has an extensive industrial history. Linked with this industrial history is the changing use of natural resources, environmental pollution, and water pollution (Rawson 2010, 108,226, Charles River Watershed Association 2014). According to the EPA, in the state there are as many as 40 superfund sites, areas marked by extreme pollution and contamination (US EPA 2018b, a). Likewise, major waterways were greatly polluted, including the Charles River and the Boston Harbor. Both waterways have since undergone major cleaning projects (Charles River Watershed Association 2014-9, Rex, Carroll, and MWRA 2002).

Ground and well water pollution have been points of concern as well. A highly notable and fairly well documented case occurred in Woburn, MA in 1982, where some of the city's well water became identified as highly contaminated with chemicals from industrial plants, resulting in high rates of disease and cancer and court case ensued (Harr 2011). Likewise, in the last several years, the major local newspaper, the *Boston Globe* has pointed out the continuing issues of environmental contamination and water pollution (Abel 2016, 2017).

Other smaller scale cases regarding concerns for water safety and quality have occurred including lead in drinking water at certain public schools and concerns in Scituate, a community in Massachusetts, population 18,133 for quality and brown color of water (Commonwealth of Massachusetts 2018, Whitfill 2018, U.S. Census Bureau 2018e). Therefore, between the larger national context and the history within Massachusetts, the sense of water security for Boston residents may not be definite.

Beyond Massachusetts, there recently have been several high profile cases across the United States that add to a climate of insecurity surrounding drinking water. Threatened contamination from fossil fuel extraction has highlighted the vulnerability of the precious resource of water. Water contamination concerns from fracking have gained publicity with images such as those in the film GasLand which showed tap water catching fire (Fox 2010). Moreover, the events of Standing Rock and the Dakota Access Pipe Line (DAPL), where a planned oil pipeline was to go through the Standing Rock Sioux's land, threatening water and sacred sites and resulting in massive protests, was highly publicized. Documentation of events surround the DAPL appeared in sources such as the National Geographic, the Smithsonian, NPR, and the New York Times (Brady 2016, Donnella 2016, Healy 2016, Hersher 2017, Larsen 2016, P.B.S. NewsHour 2017, Sidder 2016, Zambelich and Alexandra 2016). Reports from the protests made it across the country, the words "water is life" permeated images, and calls for action became pronounced (Brady 2016, Donnella 2016, Healy 2016, Hersher 2017, Larsen 2016, P.B.S. NewsHour 2017, Sidder 2016, Zambelich and Alexandra 2016). Moreover, Organizations such as the Natural Resource Defense Council (NRDC) have released reports on the contamination of water with toxic substances such as with lead (Fedinick et al. 2017, Olson, Fedinick, and NRDC 2016).

There are two related issues also specifically cited in the United States report by the WHO as pertinent health concerns (WHO and Pan American Health Organization 2017). The first is the recent drought in California. This has been both widespread and long-lasting. The increasingly devastating wildfires punctuate this situation. At the time of the research, California was dealing with such wildfires. Shortly after my return to Norway, the massively destructive Camp Fire began and has been described as California's "deadliest, most destructive wildfire" (Wootson Jr. 2018). The significance of the drought, however, is not merely contained to California. California is a major agricultural area for much of the food in the United States (WHO and Pan American Health Organization 2017). Therefore, the impact of the droughts and their links to agricultural practices have a national impact in different directions, be it with the way in which the practices might put strains on resources by being water intensive or the ways that the lack of water will impact what can be grown, costs, and food supplies.

The second issue also highlighted by the WHO, is water contamination as exemplified in Flint, Michigan, where there has been widespread lead contamination of the water supply. In 2014, the city of Flint, as a cost saving measure, changed water sources to one that was highly corrosive, resulting in massive lead and other contamination of the water infrastructure and system (Kennedy 2016, NRDC 2019, Olson, Fedinick, and NRDC 2016). The case has been seen as particularly troubling as the contaminated water has lasted for years. Likewise, the community residents have factors that put them further at risk: the demographic makeup of the city 54.3/57.2% (respectively self-identified as one race or more) of the people are African American/ Black, and it is also low income community with 41.9% of the people living below the poverty level with 60.7 % of children below the poverty level (U.S. Census Bureau 2010[17/18]-a, b). This idea of poverty and "economic inequality" is especially pertinent in the discussion of the system in the US (Uslaner and Brown 2005, 869). These two issues and others will prove important in this research as they are specifically mentioned on multiple occasions during interviews and are indeed the purview of residents of Massachusetts as issues and stressors. Therefore, the visibility and severity of these stressors related to water are relevant to this research.

At the time of the research, larger concerns relating to perspectives on water had been occurring. In recent years, there has been some, what could be described as, political shifting in the United States and a restructuring of environmental concerns. This potential concern for those interviewed and cause for uncertainty can be seen with significant changes in agencies such as the EPA where topics such as climate change were removed from even the publicly visible official website (Barron 2018, Milman 2018, Mooney 2018). Likewise, there have been many major changes to regulations and environmental protections under the present administration including loosening of mining regulation and other environmentally detrimental practices (Turkewitz 2017, McGreevy 2018, Greshko et al. 2019, Popovich, Albeck-Ripka, and Pierre-Louis 2017, Tabuchi 2017). Similarly, the uncertainty in the political area can be seen with the eventual partial government shutdown in the 2018-2019, described as the longest in US history (Arnie 2019). This changing governmental situation and shifting environmental priorities are documented in the media and therefore within the view of the people in the country.

Imminent threats of climate change and other environmental degradation are also highly publicized and can be visible to people (Achenbach and Fritz 2018, National Geographic 2015, Rich 2018, Time Magazine 2019). While climate change has controversy in the United States to a certain extent with climate change deniers, concerns about climate change are indeed at the forefront of many of discussions and reports. In particular, it is visible in Massachusetts and in Boston with reports, city actions, and even the participation in the 100 resilient cities (Resilient and Rockefeller 2019, Achenbach and Fritz 2018, Chang and Tran 2019, City of Boston 2018a, Cohen 2018). This brief literature review illustrates how Massachusetts and the US have a history of water insecurity and how water insecurity has emerged in the stories of the participants. Embedded in these stories also is an understanding and background of Boston. As theory suggests, knowledge can relate to both the individual and their society, therefore it is valuable to understand the individual's perspectives and the context (Moses 2012, 183).

Water shutoffs in several communities, including Boston, have also been highlighted in reports (Georgetown Law Human Rights et al. 2013, International Human Rights Clinic at Santa Clara University School of Law et al. 2015). Furthermore, reports of water shutoffs because of water unaffordability are also emerging with reports from places like Detroit and others (Mitchell and Frazier 2014). Indeed, with the current uncertainty across the US and recent pronounced uncertainty in Massachusetts, a sense of certainty cannot be guaranteed.

1.4.2 Boston Water

There is a considerable amount of existing literature on the Boston area and its water system. Some of the works explore the water system and its history in more depth and what impact the system has had on the Charles River and Boston Harbor (Rawson 2010, Dolin 2004). Likewise, there is existing analysis regarding the development of the technical aspects of the sewer and water source systems (Rawson 2010, Dolin 2004). Other works frame the infrastructural development with relation to other US cities (Smith 2013). Government, water authorities, and other organizations provide valuable insights into history and overall working of the system (MWRA 2019c, Charles River Watershed Association 2014-9). Additionally, there are a number of reports on Boston-based water and environment (City of

Boston 2018a). Some of these reports include studies of water affordability (Massachusetts Global Action 2014, Colton 2005). Other sources examine relevant issues of poverty in Massachusetts (Harak and National Consumer Law Center 2007, Kahn and Martin 2011). Chapter three, Water Histories, describes the expansion of the City of Boston, its changing response to water needs, and it details the organizations that oversee the supply, testing, distribution, and billing for the water. This thesis will expand upon this with the present day and experiential perspective.

As indicated, when studying the City of Boston it is important to understand how it is divided into different categories of divisional markers that include wards, census tracks, and neighborhoods. Neighborhoods are what people have referenced in their interviews. These areas are comprised of various population demographics and environmental risks as well. In its climate resiliency plan: "Climate Ready Boston," the city has identified areas of the neighborhoods: Charlestown, Dorchester, Downtown, East Boston, Roxbury, South Boston, South End and an area called Charles River which is comprised of part of Beacon Hill, Back Bay, Fenway/Kenmore, and Allston/Brighton for coastal flooding and Roxbury for multiple risks (City of Boston and Walsh 2016, 13) These neighborhoods are particularly at risk for anticipated flooding due to climate change. A map of Boston with the neighborhoods visible can be found in Appendix F, figure 3. The division of the neighborhoods and as it relates to the research process will be discussed further in the methodology chapter.

1.4.3 Understanding Theory

This section provides some of the important theoretical information that is valuable both to understand the interplay in the thesis but also the fundamental theoretical lens that is used in the analysis. Throughout the thesis, additional theories are discussed as appropriate.

Intergovernmental Overlaps

In order to understand some of the interplay of actors, it is important to understand the governance system and theories. In considering these multilayer governing systems and environmental governance, there is a large amount of discussion. For

instance, in his work *Should Trees Have Standing?: Toward Legal Rights for Natural Objects*, Christopher Stone broaches the topics of what the legal system is capable of or what it does in relation to the environment (Stone 1974). There are also follow-up works to this book as well (Stone 2010). Stone, therefore, is able to frame the question of environmental protections for the environment and question how in the American legal system the environment has a place. Stone's discussion, initially published in his 1974 work, can be seen in the larger growing environmental movement and moment of change in environmental governance of the period (Coglianese 2001, Rome 2003). Indeed, the work and theory from this period is fundamental in order to understand the broader context of American environmental protections and views, which are still relevant today. Moreover, there is existing discussion of ideas regarding levels of governance and, more specifically, those related to systems of Federalism and environmental policy. This discussion appears in such works as *Federalism and Environmental Policy: Trust and The Politics of Implementation* (Scheberle 1997) and *American Environmental Policy, 1990-2006: Beyond Gridlock* (Klyza and Sousa 2008). In these, the depiction of the interactions between Federal and State governments is complex and intertwining. In the development and implementation of the environmental policy, the Federal government and the state or local governments are able to take on different roles and have differing kinds of authority (Klyza and Sousa 2008). The Safe Drinking Water Act, specifically, has been considered through this lens of federalist governance with the interaction between the EPA at the federal level and the "public water supply systems" at the local level (Scheberle 1997, 124-150). This consideration of the interaction for drinking water supplies is particularly relevant to the research found in this thesis. The complexities of these layers can cause some difficulties and complications. As we can see the water system and security for the city of Boston is therefore placed under the scope and control of these varying levels of governance.

Issues of Insecurity and Overheating

The idea of insecurity and its implications are important theoretical facets to this thesis. Insecurity, specifically as a concept, brings in different types of considerations and frameworks. These considerations include both those that are logistical and social. More specifically, water insecurity is also a multi-faceted concept.

This thesis explores water insecurity, or the idea of it, and examines uncertainty of water for household use in terms of both access and quality. The existing academic field on water insecurity studies a range of topics and locales across the world. This specific topic often is discussed in more development related studies and contexts (Das and Safini 2018). Along with the concept of water security, there exists a discussion of who might be at risk for not having water and the interplay with larger political and historical systems (Hidalgo Bastidas, Boelens, and Vos 2017, Das and Safini 2018). Again, this is a valuable concept to consider. Indeed, in the larger study of water insecurity there are many situations of more severe insecurity than that found in Boston at present. However, the pressures involved in supplying water, ensuring its quality, and delivering it to people exist even where strides have been made to prevent scarcity.

This thesis will suggest that water insecurity exists within what Eriksen has referred to as an overheated world and that this feeling of water insecurity increases with the excessive globalization that Eriksen explores (Eriksen 2016, 2013). This will be thoroughly explored throughout the thesis. Here it suffices to say that the fast-paced changing and globalized world adds stressors to people's lives. The globalization of the world gives the impression of it shrinking, as events such as the droughts of California and lead contamination in Flint reach directly into Boston homes. This amounts to a sense of there being *"too" much* (Eriksen 2016). Herein, the idea develops of the world having almost an overwhelming sense of overheating (Eriksen 2016). The interconnectedness defines this moment and the interactions with the pressures (Eriksen 2013). Thus, in reference to water, the question becomes what is one's general awareness of and responsibility for ensuring quality and availability of water for oneself and others. Several features of this larger concept connect with the case in Boston and will be further developed. The idea of mobility as a factor in overheating is important as populations move frequently in the United States (Eriksen 2016, 58). Overall, an informative component of this theory examines the roles of cities in this process of overheating (Eriksen 2016, 81). As Boston is an urban environment, the role of cities is also relevant. Part of the overheating theory also brings in the impact of information overload (Eriksen 2016). Once more, the role of information about the current climate surrounding water will prove as a relevant underlying factor for the feelings of insecurity among Boston residents.

Finally, the idea of scales of overheating and systems of trust will also prove useful, as it is important to consider how and where the impact is felt. As the world shrinks these scales collapse and overlap.

1.4.4 Diving Further into Overheating and Time-Space Compression

This thesis will show that water stories and water anxieties in Boston are not necessarily an effect of a lack of water access or water quality. People can have ample access to good quality water, more than enough for their needs but still feel anxious. This thesis suggests that the stories and understanding of the stressors are related to what Harvey has called "time-space compression" (Harvey 1990). Time-space compression here refers to the "processes" of time and space that have an impact on "how we represent the world to ourselves" (Harvey 1990, 240). In this theory Harvey examines how the concepts of time and space are considered, and then explores the ways in which processes connect through both time and space (Harvey 1990, 201-308). The interactions that occur between these scales are also important factors (Harvey 1990, 201-308). Drawing upon earlier theorists, Harvey is able to consider practices and the dimensions of this compression. Lefebvre's material spatial practices, relates to "to the physical and material flows, transfers, and interactions that occur in and across space in such a way as to assure production and social reproduction" (Harvey 1990, 218). This is relevant to water resource use as it specifically involves the movement of resources (Harvey 1990, 218-21). Another spatial practice, the "representations of space," particularly connects with the water stories in that this practice is defined by factors including knowledge and significations in order to have understandings of "material practices" (Harvey 1990, 218-21). The water stories evidently map to this as they too represent the way the experiential knowledge allows people to understand and express the understanding of the water system.

For Harvey, the time-space compression is defined by ideas of power, changing systems, and capitalism and trade, which will also follow throughout the thesis (Harvey 1990, 201-308). The concept of speed and how the acceleration of information exchange in the world contributes to this time-space compression, also proving essential in this thesis (Harvey 1990, 284-308). This rapid change and

movement is linked with the connectedness of feeling and understanding that the participants reflected on in their understanding of the Boston water. Throughout the thesis, this speed will be a factor in how people relate to their water.

Doreen Massey adds to this concept of time-space compression (Massey 1994). She is a scholar who has been widely considered and drawn upon by others (Featherstone and Painter 2013). She reiterates a definition of time-space compression as the "movement and communication across space, to the geographical stretching-out of social relations, and to our experience of all this" (Massey 1994, 147). This means that water events or security issues happening elsewhere become those that also impact the local. Nevertheless, she also calls into question the experiences of this where factors such as race, gender, age, or other social and systemic factors may also have an effect on the relationship with the experience of place and space (Massey 1994, 147-56). In this, there is also a consideration of the power structures or "power geometry" that defines and influences these systems and flows (Massey 1994, 149). She also relates these movements and flows to the idea of a sense of place and how this is understood and considered (Massey 1994, 151). She brings in the idea of place as an intersection and "articulated moments in networks of social relations and understandings" which brings in a broader context of connecting the global and the local (Massey 1994, 154-5). With this definition of space, one can better understand the relationship and interaction of the interviews and the space of Boston as seen in this thesis. The water stories move across the space that entail geographic movement but also personal connections. These theories are important to consider for the research, as there is not a single narrative but a compilation of narratives, experiences, and voices that contribute to one's ability to understand and relate to compression, time, and movement.

From here, Eriksen's theory of "overheating" can follow the ideas of time-space compressions. Eriksen questions: "The contemporary world is …too full? Too intense? Too fast? Too hot? Too unequal? Too strongly dominated by humans" (Eriksen 2016, vii). He explains the overheated world as "The accelerated and intensified contact which is a defining characteristic of globalisation leads to tensions, contradictions, conflict and changed opportunities in ways that influence everyday life as well as large-scale processes in all parts of the world" (Eriksen 2016,

16). Eriksen's theory draws upon the idea of the particularities of the moment in time depicting it as "Ours is a world of high-speed modernity" (Eriksen 2016, vii). With this, one can explore the idea of scales and the interplay between the layers that are causing pressure on the system. Nevertheless, these "clashing scales" in the globalized world reach directly to the experience of local in Boston (Eriksen 2016, 131-156) As discussed, in the theory of overheating, Eriksen is concerned with pressures that result from a movement across space or increased mobility across large geographical areas (Eriksen 2016, 58-80). The temporal and the spatial component of the pressure will be a key feature of this explanation. As they interact in their system, they also fall into complex systems of participation (Arnstein 1969, White 1996, Cornwall 2008). Similarly, in these interactions are encounters with inequalities (Pellow 2002) This accelerated and overheated world is indeed a frame of understanding through which the reactions and water stories from Boston can be better understood.

1.5 **Thesis Format**

This thesis will argue that the water stories from Boston reflect an intersection of experiences wherein the overheated world and the theory of time-space compression (Eriksen 2013, Harvey 1990), ultimately, play out to inform understanding and interaction with the system and individual perceptions and potentially utilization of water. The following chapters will provide details on the methodology for the research, background context information, and analysis. The analysis portions aim to use the framework of overheating in order to understand the Boston-based water experience in a time of insecurity. However, it is important to note the difference between water scarcity and water insecurity. While water scarcity can be defined as the actual inadequate amount of this critical resource, water insecurity can exist even in the presence of an adequate supply for most members of a community. This insecurity can come from overriding present and future concerns combined with past experiences of scarcity. Thus, building on Eriksen's conception of contributors to overheating, the analysis will begin with the concept of time as factor through which people understand and recount their water stories. It will follow by looking at the role of information and engagement with the water system. This portion will examine the stressors related to information availability, individual engagement, and system

responses. The next section will examine the role of mobility for Boston-based consumers in this overheated situation. For this portion, the geographical relationship with other places and water systems will augment the understanding of the Boston area system. Finally, existing inequalities and trust in the water system will be examined, including causes for lack of trust in the system and what is needed for trust building.

1.6 How This Thesis Will Proceed

In this thesis, I will provide an analysis of the research looking to evaluate the pressures and understanding of a sample of general residents and Boston area community members and professionals involved in water issues or government. In order to evaluate and consider this understanding, I largely do a thematic analysis of the interviews. This thematic analysis is a particularly valuable to handle the scope of my research and interviews (Seale 2018, 429-53, O'Leary 2017, 338). Consequently, I am able to analytically sort through the data, finding links and broader connections (Seale 2018, 429-53). Throughout, this thesis draws on theories of qualitative data analysis where pieces of stories come to the forefront (O'Leary 2017, 338-40). What are developed are "water stories" with ideas and reflections merged from several sources. In this, both the specific statements and larger themes are considered.

Chapter two, Methodology, will explain the research process. This chapter considers the way in which the research was designed and executed. It discusses various consideration and obstacles in the process.

Chapter three, Water Histories, provides an overview of some of the important water events that have helped develop the infrastructural system of Boston water. This chapter provides a foundation for understanding how Boston water is supplied and an overview the extensive set of institutions, acts, and laws that have been developed. It points to the complexity of dealing with water and how this could contribute to feelings of insecurity.

Chapter four, Water Stories Through Time, incorporates stories where interviewees recount events from the past that reflect times of insecurity. Thus, stories from the past influence the way in which insecurity is understood and felt in the present.

In chapter five, Stories of Water Engagement, I move on to explore how people relate to this system by showing how Boston citizens and professionals talk about water accessibility and security as largely mediated through the role of information and involvement. As such, stories of engagement with the system will be examined to track and elaborate on how knowing about the system creates tensions and an experience of water insecurity.

Chapter six, Stories of the Present, Water Stories Across Space, explores present water stories that emanate from somewhere else. This shows how interactions across space influence the feelings of security and how people relate to their current water due to this. This chapter examines how via comparison to other places Boston-based individuals are able to characterize the feelings of security for their own system. The water stories reach from the global scale, the national scale, and the local state scale. Water insecurity observed from elsewhere becomes a felt and influential reality.

Chapter seven, Stories Across Relations and Power, explores how water stories delve into issues of trust and inequality. The nature of this is considered. This examines how people relate to and characterize the imbalances in the water system. This further examines points where there are issues and trust in the system is failing. It concludes by looking into how trust can be built despite the problems.

2 Methodology

2.1 Coming to Boston

Some of the general statements about basic Boston practices and understanding come from personal my background growing up in the Boston area and knowing people who live there. Some of this information is general knowledge for Boston-based people and certain attitudes of this were reflected in the interviews. At certain points in the thesis, there are clarifying features as to particularities to Boston-based behaviors that are typical points of common knowledge and communication for Boston-based individuals.

During the month of September 2018, I traveled to Boston, Massachusetts where I conducted the research used for this thesis. Returning to Boston, I began to familiarize myself with the city and the area more than I had in the past. I took the public transportation system to various parts of the city and generally spent a good deal of time trying to interact and be a part of the city. I also took a day trip out of the city to visit one of the water sources: the Wachusett Reservoir.

I re-immersed myself into Boston life and with a critical perspective and knowledge of theories such as participant-observation, which I incorporated into my daily practices and interactions during this period of data collection. With this, I began to re-evaluate what practices concerning water occur and why. From here, I was also able to move on to consider how people interacted and what they said in this specific context.

I initially went in questioning where there might be systems and processes of inequalities. As I entered the field, there were some challenges in respondents' specific interest or engagement with this topic; therefore, the research became more complex which entailed focusing on how people interact and led to more nuanced understandings of their water systems and accessibility.

Once in Boston I was able to follow up with points of contact that I had made prior to my arrival in Boston. Some of these points of contact proved to be very useful, while others were not as useful or simply unresponsive. Being from the Boston area,

this was sometimes a point of leverage and explanation for why I was there in Massachusetts doing research. Additionally, I made use of the local library resources and materials. Visiting the Wachusett reservoir added to my understanding of the Boston water system.

2.2 The Interview Process and Data Collection

At the core of this research is a series of semi-structured interviews of varying lengths. With each interview, an interview guide was employed and adjusted accordingly. For professionals, this guide was often adjusted based on initial knowledge about the organization or their background to make the questions relevant to their work. For the residents, the guide was adjusted more based on the context of the interview and flow that the conversation followed during the interview. These general guides that were developed are included in Appendix E and F for the professionals and residents/consumers respectively. Overall, the semi-structured interview seemed the appropriate choice for this kind of research, as this provided rich qualitative information, thereby better characterizing the experience of the interviewees (Bryman 2016, 466-7). Likewise, with the semi-structured method, there is a guide that keeps some consistency between interviews, more-so than with unstructured interviews; nevertheless, this still maintained a certain flexibility that is needed to gather insightful and rich information (Bryman 2016, 466-9). Moreover, this method of interviewing was partially inspired by ethnographic methods where qualitative understanding and detailed contextual data can be gathered (Bryman 2016, 422-464).

2.2.1 Interview Settings

An aim of this research was to gain an understanding of different interactions and experiences with insecurity of accessibility to water in the city of Boston and ideas of water insecurity. This involved interviewing government and semi-government officials, non-government professionals, and current and former residents of Boston, also called consumers of Boston water. These interviews were conducted in a variety of locations including offices, personal homes, public spaces, a fair, and many were in cafés. The setting of these interviews largely varied based on the comfort of the

interviewee, which is pertinent also with regard to ethical considerations (Bryman 2016, 120-146). There are many cafés and coffee shops in the Boston area, so these were convenient and comfortable spaces for people to meet. Likewise, because of their abundance in the area, the location could be chosen based on the interviewee's schedule. Some of the interviews were also held over the phone as per the convenience of the interviewees. Although phone interviews can have certain limitations, based on logistical practicality and ethical considerations for the interviewees, phone interviews were a method that was employed in several instances (Bryman 2016, 484), Furthermore, despite possible limitations of not seeing the person, some of these phone interviews still proved to be very in depth and detailed.

2.2.2 During the Interviews

During these interviews, detailed handwritten notes, which were close to transcriptions of the interviews, were taken. These notes also included exact direct quotations at points as well. After the interviews, the hand-written notes were typed, so as to be used in the data later. Moreover, during several of the interviews a recording device was employed. However, some of these recordings were of a reduced quality due to noise disturbances, and in other situations, people did not want to, or could not, be recorded. Because of these factors, there was a reliance on the handwritten notes taken, and the recordings have been used as supplementary and verification data. Similarly, transcriptions were largely not done but instead, as mentioned, near transcriptions were taken during the interviews and used in the analysis section. While there are arguments that say that recording and then transcribing the entirety of interviews is better, as discussed, the circumstances of many of my interviews did not allow for this, and to focus on the transcriptions could lead to biasing certain interviews over others (Bryman 2016, 479-483). Consequently, I did not want to give undue weight to those that were recorded or were not. Still recognizing the value of transcriptions, the recordings instead were used for point transcription or partial transcription (Bryman 2016, 483). I was also advised that in my circumstances that recording might not always be the best method. Thus, I was able to acquire valuable information from the interview process.

2.2.3 Gathering Interviewees

A local community network and the snowball method with convenience sampling were used to gather research participants (O'Leary 2017, 211). In this method, I reached out to a network of individuals who then were able to connect me with other individuals and organizations that were relevant to my research. I accessed many people with introduction by expressing, both through written communication and by word of mouth, that I was looking to speak with recent Boston residents and professionals in the field of water. Likewise, I also located relevant organizations or individuals and personally reached out to them through email and telephone contact.

Approximately, one third of my interviews fell into a category I have called professionals or water professionals. When speaking with the government and non-government affiliated individuals and professionals, the semi-structured interviews were conducted with a guide catered to each individual and their affiliated organization and work. This served as a reference point but these discussions were often led by the interviewees who provided insights into their work experience. Follow up questions were used during these interviews as well, based on the direction that the conversation went. Technical insight and a better understanding of interactions were also important for this component of the section. During these interviews, I made use of "elite interviewing" theories and methods (Aberbach and Rockman 2002, Dexter 2006, Kezar 2003). As such, I considered power dynamics, my position in the interviews, and the specific roles they held as representatives or individuals with specialized knowledge.

For interviews with these individuals who were chosen for an additional experience beyond that of a resident of Boston, there were several methods of gathering interviewees. I researched organizations and individuals that would be useful. I made introductions through the established networks and utilized cold contact (calling and emailing offices). This method had mixed results of response. Once I began interviewing people, I was also able to gain other points of contact for further interviewees and they served as points of introduction. There was an intersection of recommendations for points of contact. Appendix B outlines who these water professionals are and what some of their specialties include.

The other core population sample interviewed was a group of people who are, or had recently been, residents of Boston. These individuals were selected because being residents gave them a knowledge and lived experience, which I was hoping to understand and draw upon. From their experiences, came water stories. For this population, I spoke with some people in public spaces without introduction. However, through a personal network with connections to local community members and residents, I was able to find many of the individuals to interview. Here I made strong use of the snowball method, where contacts led me to others, and for residents that became a primary method of data collection (Bryman 2016, 188). The Appendix A lists the anonymized participants and some relevant information such as rental/owning status, if known, and neighborhood(s) where they reside.

For the interviews with residents, I also used a guide with questions. In some cases, this was followed fairly strictly but in other cases, the interviewees had more thoughts and perspectives and the conversation and questions followed as such. The interviews had varying lengths and level of detail. Some residents provided fairly in-depth accounts, while others gave more surface responses. Similarly, the interviewees sometimes focused on different areas as specific points of interest or concern in the discussion.

2.2.4 Challenges, Considerations, and Work-Arounds

The process of preparing and working on the interviews, presented some challenges and obstacles. For instance, one significant hindrance was that there were some people who would have been useful, but I was unable to interview, despite significant efforts to be in contact with them. Throughout the process, at different agencies and organizations, despite contacting seemingly appropriate contact points and multiple requests, there was no response. Website restructuring on the part of organizations during the thesis process also proved to be somewhat of a hindrance for gathering information. As discussed, some of the obstacles encountered early in the process, resulted in adjustments as to who would be interviewed and how. As I continued to encounter these obstacles, I also adjusted accordingly and gathered information from elsewhere.

I attempted to go to a few public locations and speak to people cold, without prior introduction. In these instances, there were only a few people who were willing to speak with me. Inclement weather also proved a challenge at points with very high heat, humidity, and rain all making it more difficult to schedule meetings since meeting outside was limited and mobility for some was also reduced because of this weather.

For the interviews without introduction or prior contact, I tried to speak to people at a public space near a transportation hub and a street-fair setting. I approached people, describing my project, showing my student ID on a lanyard, and although some people did take the time to speak to me, many people did not seem comfortable speaking with a stranger. Others indicated they did not have any comments on the topic. In addition, there were some language barriers. For example, I began my introduction speaking English, however, some people indicated they did not know much English and therefore did not want to continue speaking to me. At this point, as there were a number of possible languages that community members may have spoken (there are large populations from places including but not limited to Haiti, Vietnam, Dominican Republic, Cape Verde, and China) (Boston Planning & Development Agency, City of Boston, U.S. Census Bureau: 2006-2010 American Community Survey, et al. 2019) and other practicalities of consent form language, I did not inquire further if they would want to do the interview in a language other than English. Overall, with such challenges, this tactic of approaching people without prior introduction was not extensively used for data collection. Instead, as mentioned the main method was through the personal snowball network. Indeed, I was able to access more people by having an introduction.

The city of Boston is a city made up of different neighborhoods, with a population of over 685,000 people (U.S. Census Bureau 2018a); however, the greater Boston area, with as many as many as 4.8 million people, is made up of many more cities and smaller towns such as Watertown, Cambridge, Quincy, Somerville, and many more (U.S. Census Bureau 2018b). In fact, the Massachusetts Water Resource Authority (MWRA), from which Boston receives its water, supplies 51 communities (MWRA 2018). The greater Boston area has shared features such as a shared public transportation infrastructure of the MBTA and other shared features such as sports

teams. With these shared resources, there are distinct connections to the Boston metropolitan area. Within these areas, many people identify also as being from Boston and the city of Boston is referred to as the city itself, including all of its neighborhoods, or Boston proper. Identifying people from Boston when speaking to people from the Boston area even caused confusion. People I spoke to questioned: why not speak to people from Cambridge? Because of this, a few contributors to this research are also from the Boston area with close ties to and knowledge of the city of Boston. The city of Boston, with regards to water, is one system, with water supplied by the MWRA, and administered by the Boston Water and Sewer Commission (BWSC) so therefore, the city of Boston as a unit was a useful measure. Indeed, this measure of the City of Boston will also emerge in this thesis in terms of Massey as an intersection of different experiences of Boston (Massey 1994).

Initially when I began the research, I intended to make contact with one specific area through a community organization, however despite many attempts this proved unsuccessful. Overall, interviewing people from one neighborhood proved somewhat complicated. As a person not living in the city of Boston, I am not a member of one particular community. Larger institutional access (through churches, other organizations) also did not provide the access into the community, despite contacts with several individuals. Instead, I chose to network through my own personal network making use of social media contact, word of mouth, and cold contacts.

Within the city of Boston, there are different designations and demarcations of areas. There are larger neighborhoods, as noted earlier, there are also wards, which are related to the city council, areas have the federal classification, and there are census tracks. There are also different areas even such as squares like Copley Square, Dudley Square, or locations such as Quincy Market, and others tied to their proximity to the MBTA (the transit system) stops, such as Broadway or Ashmont. With this multiplicity of labels, multiple data categorizations are possible; thus, a general designation of being from the city made more sense as a researcher to gather people from different locations because each data source looked to unique ways of dividing the city. I did not aim for an exactly even distribution over the neighborhoods (or other designations) of Boston but instead aimed to focus on gathering, at least, differing perspectives of people willing to share their experience.

People were asked about neighborhoods that they live in, as there are some demographic indicators and trends in neighborhoods in general. Asking people for this information also seemed to be something that was distinguishable for the interviewee and was important to some as they told their stories, and they were often from different areas and backgrounds. This question of: what is a city and how is it defined, is an intriguing point others have explored before and that this process was able to consider (Boone 2013, 12-5).

In addition to the interviews, resources were gathered from respective authorities and information that is available digitally. This information is that which is available to the public and was therefore, examined as informative tools and also as resources for understanding what the public can know. Throughout this thesis, some of this information is referenced and considered as well.

2.2.5 Boston Demographics

Between the 26 neighborhoods, there can be fair amount of variance demographically between neighborhoods. Of some of the neighborhoods explored in the interviews there is variance in terms of economic status. For instance, for large portions of Dorchester, Roxbury, and Mission Hill the median household incomes falls below the city median in the brackets between $10,446.00 - $30,000.00 and $30,000.01 - $53,136.00 (Boston Planning & Development Agency, City of Boston, Boston Redevelopment Authority, et al. 2019). For the Allston/Brighton neighborhoods, a large portion falls into these categories as well, while another large section is above the city median but below the state median at $53,136.01 - $71,738.00(Boston Planning & Development Agency, City of Boston, Boston Redevelopment Authority, et al. 2019). South Boston is largely above $71,738.00 but also has portions in the $10,446.00 - $30,000.00 (Boston Planning & Development Agency, City of Boston, Boston Redevelopment Authority, et al. 2019). Likewise, Charlestown is also largely above $71,738 but also with portions in the $30,000.01 - $53,136.00 range (Boston Planning & Development Agency, City of Boston, Boston Redevelopment Authority, et al. 2019).

Figure 1: Map of Boston Median Household Income
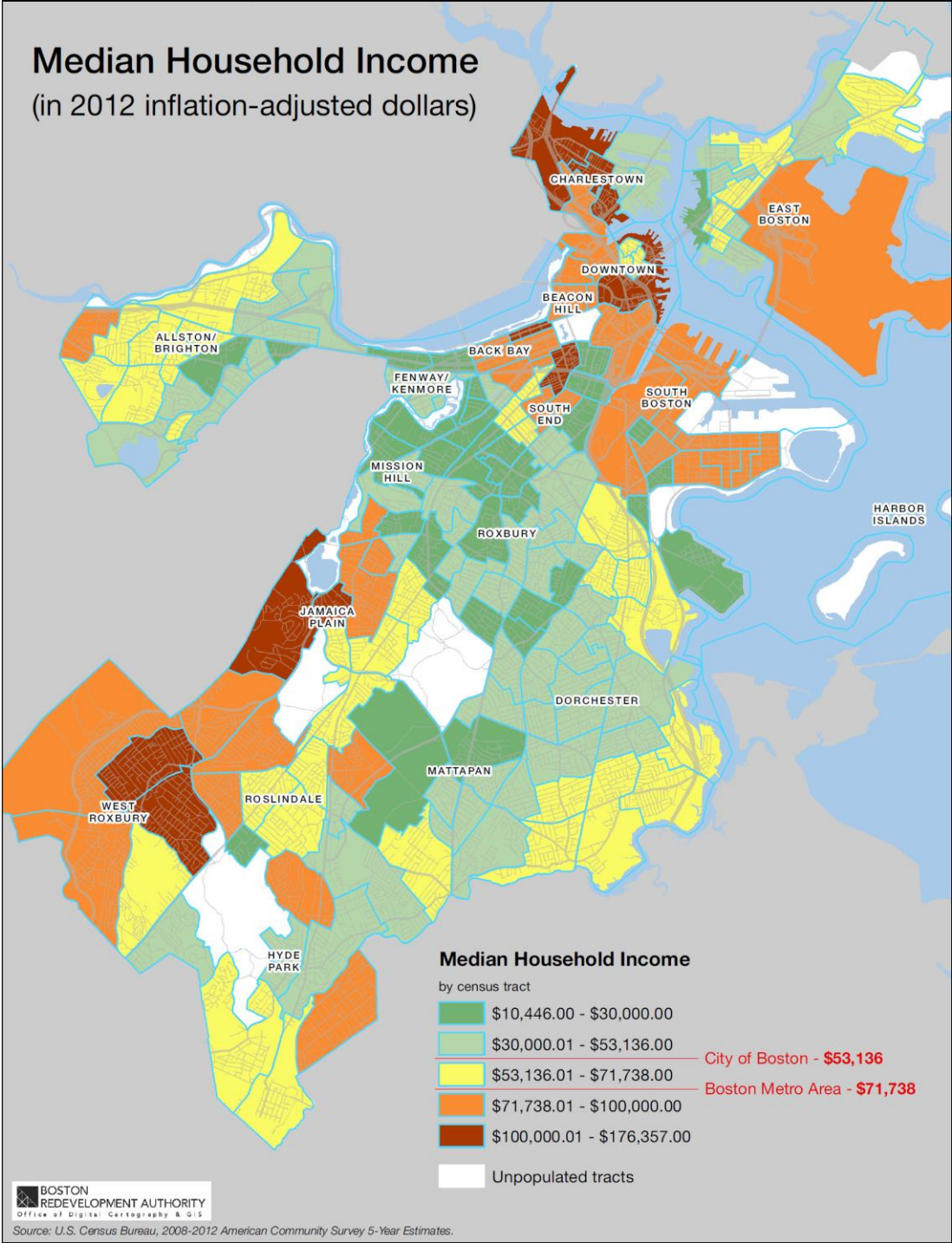
*Map of Boston with median household income shown. The divisions are based on census tracts with the neighborhoods approximately labeled. This was created by the Boston Planning and Development Agency and was confirmed allowed for use May 6, 2019. (Boston Planning & Development Agency, City of Boston, Boston Redevelopment Authority, et al. 2019)

There is also variance between the percentage of renter-occupied properties versus those that are owner-occupied. Some places like Brighton were 76% renter-occupied

and West Roxbury being one of few neighborhoods with a majority owner occupied (City of Boston: Boston Planning & Development Agency and U.S. Census Bureau 2017). Different demographic variance between neighborhoods also includes variance in percentage of populations based on race and ethnicity. While this thesis does not purport to be a statistically representative sample of the area, the table below includes some of the demographic makeup of several of the different neighborhoods included in the interviews (City of Boston: Boston Planning & Development Agency and U.S. Census Bureau 2017).

Figure 2: Select Boston Neighborhood Demographics

Row Labels	White pop.	Black/ African American pop.	Hispanic pop.	Sum of Asian/PI pop.	Other pop.
Allston	57 %	5 %	13 %	20 %	5 %
Back Bay	79 %	4 %	6 %	9 %	2 %
Brighton	70 %	4 %	9 %	13 %	4 %
Charlestown	76 %	5 %	10 %	8 %	2 %
Dorchester	22 %	43 %	17 %	9 %	9 %
Jamaica Plain	54 %	13 %	26 %	5 %	3 %
Roxbury	10 %	52 %	29 %	2 %	7 %
South Boston	78 %	5 %	10 %	5 %	2 %
South End	54 %	13 %	14 %	16 %	3 %
West Roxbury	73 %	10 %	8 %	6 %	2 %

*Created for this thesis with data from the Boston Neighborhood Demographics Summary Sourced From 1950-2010 Decennial Censuses, NHGIS, BPDA Research Division Analysis (City of Boston: Boston Planning & Development Agency and U.S. Census Bureau 2017)

While people are from neighborhoods, they may or may not match the exact demographic profile of the neighborhoods, or may fall into different demographic categories, which could be more relevant to their lives. Instead, while interviewing a diverse population, much of the information was based on what they chose to share about themselves in the interviews and their experience was examined as their individual story.

2.3 **Ethical Considerations**

When conducting this research, ethical considerations were a key component and concern. Logistically, for this research I followed NSD guidelines and guidance on

conducting ethical research. This included giving interviewees a letter of introduction and consent forms, which were tailored to my research and in certain cases to respond specifically to the interview as needed. These letters and forms were to ensure consent to research and to help the participants understand the scope of my research. Moreover, with the interviewees, I also gave an explanation about my research during the research process. Individuals were able to ask questions and clarify points as needed to understand what my research entailed. So as to further protect the interviewees and, as it is an accepted convention with NSD and in research, the interviewees have been anonymized and given new names. These new names and relevant non-identifying information are included in the aforementioned Appendix A and B at the end of the text. This can be used as a guide through the names. Moreover, certain organizations have been named but others have not based on discussion, relevance, and anonymization.

Another aspect of ethical considerations is regarding aspects of how I conducted the interviews. A key component of this was respecting the person with whom I was speaking (Kezar 2003). As Kezar explores in a discussion of transformational elite interviews, I also worked to build trust and employ high degree of empathy (Kezar 2003). Many of the people had different experiences to consider, so this needed to be appreciated. This even sometimes included sensing and using cues to know when to change from a line of questioning if a topic seemed too sensitive. Respecting privacy, required meeting where the interviewees chose. In some instances, the broader scope of the research helped ensure them that my research will not cause them harm also needed to be made clear. I maintained an environment where people were not subjects to be studied but instead voices to be contributed. Respecting people as individuals with a valuable perspective was vital. I also tried to allow people to give as much information as they wanted. Being familiar with social etiquette of the region, I tried to employ visual cues, and body language to interpret which points to pursue versus those, which the interviewee preferred not to discuss. This process included adjustments of methodological practices such as in some cases people did or did not want to be recorded. In other cases, people wanted to conduct interviews over the phone.

Overall, in the process I aimed to in no way cause any harm to those who chose to participate. With the anonymization of the data, the residents were assured that no harm would come. Likewise, when speaking with organizations the representatives were also anonymized to protect the individuals. The interviews with organizations were used largely to gain information about the role of the organization as presented, and therefore also, ensuring that no harm occurred. Throughout, I have worked to represent the data from these interviews as they were presented. Likewise, generally the research avoided sensitive information that could put people at risk and employed discretion as such.

2.3.1 Role as a Researcher

Considerations of positionality were also reflected upon in the process. Reflexivity was thus vital throughout the various parts (Kezar 2003). Indeed, a point of consideration for ethical concerns was my position as a researcher. During interviews, there are power dynamics and interactions that are at play that can impact research; thus, I strove to be aware of these (Aléx and Hammarström 2008, Kezar 2003). As there are major universities in the Boston area like Harvard or Boston University which could be considered in connection to class and systems of elitism, my being connected to a university already had implications for dynamics and power structures. I am from a university, which could make one perceive me as part of that power system. However, I am also from a foreign university that might be less known to those of Boston; therefore, this also placed me outside of the Boston area university system. There were also points to consider such as my age, my gender, my race, and how these might impact relations and power dynamics in each setting and interview (Aléx and Hammarström 2008). Linked with my age was the perception of me as a student. Therefore, instead of viewing me strictly as being from an agency, it seemed some people were more receptive to assisting me with my studies. Being very transparent about my project was critical in maintaining this respectful power dynamic.

Even the way in which I speak and my current accent, which would not be categorized as the thick Boston accent and which has also been morphed through time outside of Boston, places me in certain positions and could impact power dynamics. Just as with my accent, I occupied a sort of liminal position from both

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being a Boston area local, but still from just outside of the city and also carrying the connection to Norway. This dynamic, of being both local and not, also undoubtedly influenced power dynamics and perceptions of me. Throughout, as I had my interviews I tried to minimize these possible inequalities, as discussed before, through being respectful and aware of the situation in which I was. This awareness also included being responsive to how people interacted with me and perceived me. The use of introduction and the snowball effect also helped me to deal with some of these challenges. Throughout this thesis, there are occasional commentaries on these thoughts considering positionality and my role as a researcher and how this may have had an influence on the process.

3 Water Histories

This chapter will establish the water history and relevant information that will be critical in order to understand the chapters and discussion that follow, specifically regarding the research. The chapter starts with an overview of the water history of Boston, thereby providing definitions of modern players. Thereafter, the chapter looks into how Boston, Massachusetts, and the various levels of government that interact. The next portion of this chapter defines some important players and elements of the system that play a part in understanding what is being discussed at large.

3.1 Events in Water History: Institutions

This section explores the water systems in Boston, by giving an overview of important water events in Boston and how the different scales of government have interacted in relation to these. I argue that these are important in the development of the Boston water system and importantly also why people feel insecure or even at times do not trust the water system. It includes a general timeline and begins to define some of the key players in the infrastructural system of Boston water. These are particularly relevant components or institutions of the water system that will be useful to know in order to have an informed overview. Throughout the thesis, other players and definitions will be included as appropriate. Several events in the history and development of the water network are particularly pertinent to the present state of Boston water and people's perception of it.

3.1.1 The City of Boston: Expansion of Water Needs

Water has, as expressed in the introductory chapter, always been an issue in Boston. Boston is the capital of the Commonwealth of Massachusetts. Moreover, the city is one of the older cities in the present-day United States. Boston was established in 1630 as part of the British Massachusetts Bay Colony, eventually becoming the capital (Dolin 2004, 4). As such, it has a long history, including a long history of water management, which has been important for the establishment of modern day Boston. Over the centuries the city has expanded physically, both adding new

landmass and geographically, incorporating new areas (Seasholes 2003, Boston Public Library 2019a). The process of physically adding new land, termed "landmaking" involved extensive processes where water surrounding the original Shawmut Peninsula was filled in and the landmass of the city was thereby increased (Seasholes 2003, 2-3). New neighborhoods were also added to the city through annexation in the 19th and early 20th century including: Roxbury, Dorchester, Charlestown and Brighton (Boston Public Library 2019a). Indeed, the city has changed over time. With these changes we see the expansion of the physical structure of what encompasses the city of Boston and thereby the potential for expanded resource use and population expansion. Similarly, specifically with the "landmaking" there is physical change to the land and the relationship with the environment (Seasholes 2003).

Likewise, the location of Boston and its proximity to water have also proven significant. The city is surrounded by different waterways that have had roles within the city. Today still, the city is similarly noted for its proximity to the Charles River and the Boston Harbor (US EPA 2014, Rawson 2010). Both the harbor and the Charles River can be seen in Image 6, 7, and 8. The city and its water are also linked with other cities in the metropolitan area. The city of Cambridge, Massachusetts is particularly connected, as it is a city just across the Charles River, visible in Image 7 in appendix F. Similarly, an extensive impact from the industrial revolution history resulted in intensive land and water use and pollution (Rawson 2010, 108,226, Charles River Watershed Association 2014).

3.1.2 Emerging Infrastructure

An element of the water source is the creation of systems as the city and infrastructures expanded. In the 1840s, as Boston residents faced limited and low quality water, the city's first municipal water system was created (Rawson 2010, 75-128, US EPA 2014). Up to this point the city had been facing water insecurity and scarcity in some parts of the city and a large combination of water sources, which also vastly differed based on affluence (Rawson 2010, 75-128, Laskey and MWRA 2014). Wrapped in the creation of the new system were questions and debates regarding public versus private water systems and questions such as health, both of which remain today and were considered by some of the interviewees (Rawson 2010,

83-92, Smith 2013, 84-92). At this point questions of costs and funding for water, which also still exist, emerged as well (Smith 2013, 92-4, 97-8).

With the establishment of the municipal water system, the question of water as right, began to emerge, much as exists in the discussion in present times (Rawson 2010, 98-105). The completion of this system was even marked by a large celebration (Laskey and MWRA 2014, 75-6, Rawson 2010, Boston Public Library 2019b, Smith 2013, 78-81). With this, we see how concerns for water scarcity prompted change and an important event in Boston history. The emergence of the public water system, nevertheless, was not without complications. The development of the water system also contributed therefore to direct sewage pollution into waterways such as the Charles (US EPA 2014). Indeed, during this period there was inadequate means for handling and disposal of the wastewater (Dolin 2004, 27-9). Likewise, with regard to modern concerns, with this event we also see how the system and the city itself could be viewed as somewhat old in that infrastructure was already emerging in the 19th century. Going forward in the infrastructural history, there was then a continued expansion of the water systems for Boston and the surrounding areas and growing concern for sanitation and health measures (Dolin 2004).

3.1.3 The Quabbin and Wachusett Reservoirs

The Quabbin reservoir, along with the Wachusett reservoir, are two reservoirs west of Boston and serve as the main sources of water for the cities and towns in the MWRA system, of which Boston is a member (MWRA 2019c). The Ware River is also a part of this water source system and watershed as well (Massachusetts Department of Conservation and Recreation (DCR) 2016). The Quabbin is the larger of the two reservoir sources. Holding 412 billion gallons of water (approximately 1.56 billion cubic meters), the Quabbin has the capacity for five years' worth supply of water (Commonwealth of Massachusetts 2019b, MWRA 2019c). In 2018, the average water demand per day on the system was 199.98 million gallons (approximately 757,000 cubic meters) (MWRA 2019d). This is well below the maximum safe yield of 300 million gallons per day (approximately 1,136,000 cubic meters) (MWRA 2019d). Wachusett Reservoir contains approximately 65 billion gallons of water (246 million cubic meters) (Commonwealth of Massachusetts 2019d). Photos of this reservoir can be found in Appendix F, Images 2 and 3.

Together they provide water to as many as 2.5 million people and are managed by the Massachusetts Department of Conservation and Recreation (DCR) (Commonwealth of Massachusetts 2019d, b). These two reservoirs are part of protected water sheds and get their water from precipitation, specifically rain and snow (MWRA 2019c). The smaller of the reservoirs, the Wachusett, began construction in 1897 (MWRA 2015). While the larger, the Quabbin was constructed between 1926(7) and 1946 by flooding the Swift River valley (MWRA 2015, Massachusetts Department of Conservation and Recreation (DCR) 2016). The role of the reservoirs, their creation, and their position in relation to water security will be explored later with regard to the pressures created over time. While not perceived as a commodity, there is a sense of ownership of the reservoirs by the interviewees and pride in the knowledge that at present there is an adequate supply to meet the member's needs. The creation of the reservoirs proves to be an important moment in the history of the water system as they are still used today. A discussion of these reservoirs emerged in the water stories, which will be explored further.

3.1.4 The MWRA

The Massachusetts Water Resources Authority, the MWRA, is a key organization for the discussion in this thesis. The MWRA serves as a water provider for various communities in Massachusetts and is the provider specifically for the city of Boston. The MWRA is described as a public authority that "provide[s] wholesale water and sewer services to 3.1 million people" (MWRA 2018). Moreover, the MWRA provides water for as many as 51 communities as well as sewer services to 43 communities, with some overlap with these services (MWRA 2018). Evidently, with this major role in water and sewer provisions, the MWRA is important in considering the water systems relevant to those consuming Boston water. This organization fits into a unique role, as it is a regional public authority created by the state and provides services to many communities, not merely one. This organization is also relevant to this thesis as a professional, Alex, with experience at the MWRA was interviewed regarding the work and role of the MWRA. the work of MWRA involves the treatment of water including adding of ozone as a primary disinfectant, hydrofluorosilicic acid (fluoride) for dental health, and sodium carbonate to reduce the chance of lead and copper leaching into the water (MWRA 2019c). It is also

responsible for testing. Likewise, after use, wastewater is also treated by the MWRA largely at the Deer Island facility (MWRA 2016a). A photo of the Deer Island facility is visible in Appendix F, Image 6.

The MWRA was created via legislation in 1984 and began assuming responsibility in 1985, replacing the role of the Massachusetts District Commission (MDC) in these aspects of water management (Dolin 2004, 99-142, MWRA 2019a). A major part of this transition was the issue of waste disposal, the cleaning of the Boston Harbor, and the creation of the Deer Island waste treatment facility (MWRA 2016a). This work was in response to the condition of the Boston Harbor and the need to remedy the situation. This creation and these changes were amidst pressure from the EPA and a federal lawsuit for the violation of the Clean Water Act (Dolin 2004, 99-142, MWRA 2019a). There were major changes made and the harbor conditions improved drastically to the period of today. The success of the initial effort and the ongoing maintenance of both adequate fresh water and a clean harbor are credited to the efforts of this organization (MWRA 2016a).

3.1.5 The Boston Water and Sewer Commission

The local level of the water system is administered by the Boston Water and Sewer Commission (BWSC). The BWSC is a department within the city of Boston that was created in 1977 as combination and replacement of sewer and water services from the Public Works Department (BWSC 2019a). The BWSC specifically is the agency that handles distribution and billing of water for the city of Boston. Therefore, the BWSC works with MWRA to provide water to Boston residents and the Boston community. The BWSC does a range of tasks and services across the city. These involve maintenance and managing of the city's water infrastructure. Working with businesses is another feature of the BWSC, as there are many non-residential uses of water in the city as well. There are informational and educational services that the BWSC also provides to ensure that consumers both understand the services and resources provided, as well as the costs involved. The BWSC also determines the rates of the water or the cost that the consumers pay for the water services. In 2017, 86.4% of the accounts for the Boston Water and Sewer commission were residential, while 47.2% of the total consumption was residential (BWSC 2017, 76, 5).

3.2 Histories of Governance

3.2.1 Massachusetts

Boston is the capital and major city of the Commonwealth of Massachusetts. As a government, the Commonwealth of Massachusetts functions as one of the 50 states in the United States. With this composition, it falls under federal jurisdiction and laws but it is also part of a region called New England, consisting of 6 states in the Northeastern part of the United States: Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island and Vermont (U.S. Census Bureau 2018c, U.S. Census Bureau 2015/6). Amidst the struggle for independence from Great Britain, the Constitution of the Commonwealth of Massachusetts was created in 1780 and is described as the "oldest functioning written constitution" (Commonwealth of Massachusetts and Massachusetts Court System 2019). This constitution even predates and influenced that of the United States (Commonwealth of Massachusetts and Massachusetts Court System 2019). Indeed, it is important to note when framing the concept of water for residents of Massachusetts, that unlike the US Constitution, the Massachusetts constitution does include the right to water detailed as: "The people shall have the right to clean air and water" (Murray and Kominers 2014, 11, Mass. Constitution, art. XCVII). This is in contrast to most other state constitutions as well as the US Constitution where water is not identified as a right.

With the founding of the city and the regulations for the state, there, embedded within, is the history of water. The policies such as the Massachusetts Water Policy of 2004, the Sustainable Water Management Initiative (SWMI), and the Water Management Act play a role in water security (Commonwealth of Massachusetts 2019e, c). Agencies such as the Massachusetts Department of Environmental Protection and the Department of Conservation and Recreation amongst others play important roles in water management and protection (Commonwealth of Massachusetts 2019c).

At the state level of governance, there is a similar set up to the US Federal system where in there are three branches with judicial, executive (with a governor), and legislative (Commonwealth of Massachusetts 2019f). For law making and policy at the legislative branch there are representatives both in the State Senate and State

House of Representative (Commonwealth of Massachusetts 2019a). The government make-up of Massachusetts is particularly pertinent as this is where policy and action, which pertains to Massachusetts-level water, is often occurring.

In this thesis when the term *state,* unless otherwise noted, is used generally to mean the governmental unit or subdivision that exists within the United States, a country comprised of 50 states and other regions. For this, the Commonwealth of Massachusetts is one such *state* as is Connecticut or California. The *Federal* or *national* government is the category that is defined by the broadest spanning government unit, the governmental level that pertains to the entirety of the United States.

3.2.2 Systems of Federalism

Another consideration in the role of Massachusetts is its placement in relation to the Federal system and the larger government of the United States. Massachusetts falls under the jurisdiction and control of the three Federal branches of the US government: Executive, Judicial, and Legislative (US Federal Government 2019). There are various departments and agencies that have relevancy and forms of control over what is happening in Massachusetts and various regulations with which Massachusetts must comply (US Federal Government n.d.). Likewise, in the legislative branch of the Federal government, Massachusetts sends representatives both to the House and to the Senate.

These different scales of government are relevant as they inform the functioning of the United States and oversee some of the critical parts of governance and functioning. During the interviewing process, individuals presented their understanding, framed within the organizational and governmental structures they encountered or for which they worked.

Legal frameworks or theory and policy analysis theory are considered in this. For instance, the clean water legislation at the national level includes the Safe Drinking Water Act (US EPA 2015) and the Clean Water Act (US EPA 2013b). Nevertheless, at the state level in Massachusetts, there are further protections and legislations (Commonwealth of Massachusetts 2019e, c).

4 Stories Through Time

This chapter explores how history and the past inform the understanding of water systems in the present. Indeed, the past events and the understanding of these place a pressure on the relationship with the present water system. Stories through time illustrate how these past events and changes through time supplement the understanding of the present and therefore the way in which people are able to feel water insecurity in their system. This is comprised both of knowledge of the specific history of the water system and its insecurity, as well as, formative experiences in people's lives.

The water history and interactions with the past merge and thus the present understanding is defined by the past occurrences and the compression of the experiences. Therefore, the stress one feels in the overheated present is a composite of not just the present reality of any given system, but also past experience with it or with similar systems. This definitive relationship with the past illustrates a form of "intensified contact" that impacts "everyday life" (Eriksen 2016, 16). Going forward, this type of knowledge also can inform and influence understanding of solutions for places developing water systems. As the past stories of insecurity meet with the present, a vital intersection of understanding of the overheating emerges.

4.1 Water Source History

Entwined in the understanding of the water in the present day is an understanding of the water source and how it has evolved over time.

As detailed before, part of the understanding of the water sources today relates to one's knowledge of the history of the Quabbin Reservoir. The history of the creation of the Quabbin and other reservoirs like the Wachusett reflects several issues of security. Linked with the creation of the reservoirs was the concern about the source of water and if there will be enough to meet the demands of the populations. The Wachusett Reservoir began development in 1897 in order to meet the growing demands of the metropolitan area and resulted in parts of four towns being flooded in order to create the reservoir (MWRA 2015). Likewise, the story of the creation of the Quabbin reservoir, an even larger reservoir resulted in the complete flooding of four

existing towns: Dana, Enfield, Greenwich, and Prescott. In 1927, the Swift River Act was passed for the funding of the project (Massachusetts Department of Conservation and Recreation (DCR) 2016). Thus began the process wherein over the next decade land was cleared and the dam was constructed (Massachusetts Department of Conservation and Recreation (DCR) 2016, Tougias 2002, xii). By 1938, the towns were disestablished, and in 1939 the water began to fill as the Swift River was held back, submerging the area (Massachusetts Department of Conservation and Recreation (DCR) 2016, Tougias 2002, xii). In 1946, the reservoir reached the point where it had been filled to its capacity (Massachusetts Department of Conservation and Recreation (DCR) 2016, Tougias 2002, xii). This expansion of the water resources was an important point in the story of the water source history as it was created to again reliably meet the growing demands of the Boston area population (Massachusetts Department of Conservation and Recreation (DCR) 2016). Therefore, one can see the role the Quabbin played and continues to play for dealing with water scarcity. Encompassed in this point in water history is also a sense of loss for the communities that were flooded and the 2,500 people who were displaced (AP 1987, Peirce 2004). This sense of loss and land being taken by an outside population also is discussed for its parallel to the earlier loss of the land by the Nipmuk (Tougias 2002, xii).

In building the reservoirs with massive amounts of water contained therein, water authorities have been able to better ensure the security of the water for much of the Boston region. This type of security is described by the MWRA as it projects from planners that is it will be "sufficient" for the "foreseeable future" (MWRA 2015). As Jacob, who had lived in Boston for many years, recalled his understanding of the Quabbin, he mentioned that one never hears about the Quabbin being low, indicating a sense of infrastructural security acquired through positive information over time. Again, here is a moment of reflection on knowledge and information regarding the Quabbin and its history that he has gained through time. Here through a knowledge and experience he affirms the sense of this continuing ensured security, with the massive amount of water in the reservoir available to protect the people.

A problematic circumstance that underwent change was that between 1969 and 1988 the MWRA (and previously MDC) communities were drawing above the safe yield

limit of 300 million gallons per day (approximately 1,136,000 cubic meters) (MWRA 2019d). This posed a threat for having enough water security, particularly if drought were to happen. Alex, with MWRA experience brought up this story as well. To address this the MWRA began a water conservation program that included extensive leak management, public education, infrastructural replacement and repair, new plumbing codes, and improved meters (MWRA 2019d). The success in bringing change with this program was evident in that by 1989 they were within safe limits again (MWRA 2019d). This progress in water security by the MWRA reflects yet another changing system the people experience (Harvey 1990).

For many, this history of the Quabbin reservoir presents a poignant moment into the past and preserves an understanding in their water source and the significance therein. As they relate to the water history, their experience of the insecurity encounters "stretching-out" in this case over time such that the pressure is compressed (Massey 1994, 147). Connecting to the past allows for the sense of overheating in the present.

Jacob continued describing how he saw himself as fortunate and explained the history of the Quabbin reservoir. In this description of the history he explained how through eminent domain rivers were dammed forming the Quabbin reservoir. He also described how it is "fascinating" to see the old building if someone goes scuba diving. There is a documentary that was made specifically of a scuba diving crew studying what was under the reservoir (WGBY Documentaries and Klekowski 2001). This could also be what Jacob was referring with the scuba diving. All the same, in reflecting on the scuba diving, Jacob is able to emphasize the way in which he has information and knowledge to connect with the water source's past. Through this information sharing, he also emphasizes what he knows and some of his feelings towards the information, for instance the feeling of fascination. Jacob also drew upon the similar positive narrative regarding the water of the Quabbin as he described the good taste of the Quabbin water.

Jessica presented an interesting case of her knowledge and relationship with the story of the Quabbin. She too explained that the water comes from the Quabbin reservoir, yet she also mentioned how when she was a child, she had read a picture book explaining the story of the creation of the Quabbin Reservoir. This book, *Letting*

Swift River Go explains the creation of the Quabbin Reservoir and the flooding of the towns as from the perspective of a child from one of the towns that was lost (Yolen and Cooney ilustr 1992). (*Researcher note, as a child they had read this same book to us in school as well*) In referencing this book, she displays a local sort of knowledge reaching directly from her childhood and a rather unique but important source of information, children's literature. This also shows a type of long-term knowledge she has about the system. She explained another connection with the Quabbin, that her uncle had been from one of the towns that had been flooded and how she thinks about that link. With this additional story, she expressed an additional source of personal interest in and connection to the topic. Therefore, her life path has made it such that she is directly involved in the system source. The understanding of the system is thereby strongly influenced by the personal information gathering and connections. There is a clear sense of connection or engagement with the systems.

Jean, however, brought in another factor of consideration in the description of understanding of the past for the water source. Jean explained, "I know Boston water is from Quabbin, created where mostly working class communities were displaced." With this statement Jean is able to frame the past and the present Boston water source of the Quabbin with another factor, that of population displacement. By mentioning the communities' working class status or demographic composition, this statement also begins to incorporate ideas of social justice in the idea of knowledge, information, and understanding of the water system.

Thus, the creation of a water source comes at a cost, which can be overlooked at the time when pursuing the concept of the greater good. This type of knowledge builds into stress experienced for the socially aware, similar to what happened at Standing Rock, where the "positive" of the oil pipeline was juxtaposed to the needs of the Sioux Nation. Around the world, similar stories have occurred with flooding of communities for the needs of others.

4.2 Founding the MWRA: The Harbor and River Cleanup

4.2.1 Dirty Water

Another larger story linked with the concerns for water security and quality is a question of pollution. Both the major waterways near Boston, the Charles River and the Boston Harbor, have had a history of being notoriously polluted. Nevertheless, in the last decades they have also undergone major cleanup projects. These clean-ups are significant both for human health and use, as well as ecosystem and watershed health (Rex, Carroll, and MWRA 2002, 8). This story of the cleaning of the Boston Harbor and the Charles River is a crucial part of the water system and the relationships people can have with the their water. When the major cleanup project of Boston Harbor began work in 1985, the water was highly polluted with sewage and runoff (MWRA 2016a, 2019a). It was described as "once one of the most polluted waterways in the nation" and the "dirtiest harbor in America" (U.S. Geological Survey and Woods Hole Coastal and Marine Science Center 2018, MWRA 2016a). As mentioned, it was through state action that the MWRA was created to address the need of cleaning harbor and installing a responsible sewage treatment system. The bacteria levels and other water quality indicators also were at levels that were of concern but now have greatly improved. The story of the Charles River was similar, where while having been notoriously polluted, it underwent a clean-up effort.

Indeed, the water cleanup project is described as a major accomplishment in literature from sources like the MWRA and the Charles River Watershed Association (Charles River Watershed Association 2014, 2014-9, MWRA 2016a). Similarly, several of the professionals reflected on the significance of these watersheds and the water quality. In this way, the technical and professional stance marks the significance of the project and the accomplishment that is has become.

This change in the water through time has also resonated with residents as they reflected on this changing condition of the water quality. Both Ellen and Brigid brought in their past and reflections over time to consider the water quality. Ellen recollected how although she has generally found a lot of consistency over time, the

cleanup of the Charles River and the Harbor was a major change that she was able to witness. Brigid also commented on this cleanup process. She described how the Boston Harbor had been highly polluted and took years to clean up. She also explained how, despite this pollution people were still avidly using the water of the harbor. She recalled how she used to swim in the harbor and it would be so crowded she would "pick [her] way through the people" to get to the water. She further described, "There was no daycare especially for people in that income bracket. So you would see people where they were like a daycare. What were you going to do? No one had A/C." With this memory, she draws upon her perception and understanding of the pollution situation of the Boston Harbor and how it is has changed over time. She also reflects upon the significance of this improved water quality condition because even when it was highly polluted it was still being used by people, so, therefore, this was a problem because it was not safe. This story also brings in questions of inequality to be discussed later because she was indicating that the lower income community had to use the water, as this was where people and many young people in particular would congregate.

Others also reflected on their knowledge and the significance of the water cleanup project. These stories fell more in the category of historic knowledge than expressed as explicit lived experiences. Nevertheless, it still was framed as a reality for the people. Indeed, the cleanup of the Charles and the harbor both seemed to be important points of concern to them.

The presence of this water pollution continues to be engrained in the memories and identities through the popular song "Dirty Water" by the Standells that echoes through minds of Boston natives. The well-known words: "Love that dirty water, Boston you're my home" sound through Fenway Park as the song plays at the Red Sox victories (the local baseball team and an important Boston institution) (Lemoult 2018, McDonald 2014, The Standells 1965/6, Sweeney 2016). With this song, the water pollution clearly becomes a sort of cultural institution and understanding of this recent reality of the polluted Boston area waterways (Lemoult 2018, McDonald 2014, The Standells 1965/6, Sweeney 2016).

Evidently, the experience of Boston area waterways as polluted is a defining feature that permeates to the present, thereby reinforcing an overheated present.

4.2.2 The MWRA and Sewage

A part of the situation with the water pollution is linked with the sewage. The sewage treatment and water system that Boston has today is based on an evolution from past problem. The sewage system and the surrounding water ways have a close link and history. Therefore, the question of how to deal with sewage has long existed for the city of Boston, and it has undergone some significant shifts and solutions over the past decades. Recognizing the implications and costs involved in remediating an inadequate accommodation for wastewater remains a base point of knowledge in the Boston area.

The story of the water treatment for the Boston area in the present is intrinsically linked with a story of the past. Currently, a major location for sewage treatment is at the Deer Island treatment facility, where after treatment remaining waste water goes further out into the bay. Before this, the water had little treatment and was put directly into the harbor. As explained in the history section, the MWRA, as an organization, was created in 1984 to deal with the management of the area water and the issue of water pollution and waste management. The professional with MWRA experience explained the role and history with the EPA and the subsequent formation of the MWRA to deal with the waste water. The situation is represented positively by some; for instance, the state representative spoke well of the MWRA, describing it as a "public policy success."

Likewise, several of the residents also discussed the sewage treatment at Deer Island and the capacity of the city to deal with the waste water. It has been 35 years since the creation of the MWRA, and while the MWRA and the efforts to clean the harbor were widely reported at the time of the MWRA's formation and during the cleanup, stories about the MWRA no longer dominate the local headlines. However, we see the development of the present day system inherently linked with the insecurity of the further and more recent past. The understanding of the present system is framed with creation of this facility and its role in the system. Likewise, the creation of the MWRA is also within the lived memory of many in the Boston area, for instance Jacob noting this as an important change that he had witnessed in his time within the system.

Indeed, the problem of the water pollution and insecurity exists within living memory and people have witnessed the shift in the systems. These are important moments to understand what is happening now and what people are using as a frame of reference when discussing water issues and can help inform others of the peril of ignoring the need for adequate treatment of wastewater.

4.3 Lead in the Pipes

Another important issue dating back to historic problems that still concerns and affects water consumers today is the presence of lead in the pipes. This can be both an issue with lead soldering and with lead in pipes such as service pipes. As explained, distribution lead pipes were removed by the city but pipes on household properties do not have the same safety standards and need to be removed by the individual homeowner, The individual from the BWSC highlighted the historic nature of the buildings in Boston an and how although the city pipes have been replaced the household pipes also need to be replaced if lead is to be removed from the system.

This relates to history in a sense that it is the historic practice of using lead pipes and using lead solder when putting pipes in, and the latter is where the problems occur also, for while individual may pull out pipes if they are lead, simply having lead solder may not prompt as much feeling of necessity. The infrastructure of the city is dependent on older systems; consequently, many pipes need to and have been replaced. However, many of the buildings in Boston are old so this can be an issue that is a problem that continues from the past. For instance, the pipes of Rebecca's building were old and problematic, the case of which will be expanded upon further.

4.4 Witnessing the System Through Time

The pressure of time on understanding and senses of water security emerges also as people personally witness the system overall through time. In speaking with consumers, some of these individuals indicated that they possess a knowledge of the water system that appears to have been acquired over time through experiencing the

system itself. The changes that comprise the overheated and compressed experience are tangibly felt over their lifetime.

Sidney was one such informed resident. With as many as 40 years of living in Boston, she was able to explain certain local political features. She also was able to recount certain changes such as pipe replacements and responses to the 9/11 attacks. With this, she was able to display a knowledgebase on the evolution of the water system and involvement through living in the city for an extended period of time. Aria who has lived in Boston 30 years also commented on how she had not seen many major changes in her life there, reflecting a perspective of time and experience as an informative tool. Ellen also recalled the changes that had happened 10 years before with the replacement of wooden pipes and water being diverted.

Brigid also has been a long-time resident and brought in an experiential acquisition of information as well. She was well-versed on many different features of the Boston based water system and with some of these; she brought in very specific personal experiences. For instance, she was able to explain water piping and zoning regulations changes and an understanding of them based on an experience with external pipes freezing in the cold Boston winter. She also was able to recount a time when she was younger, which she marked as a rarity when there was a fairly significant drought during the summer. She discussed the old pipes that were hollowed out logs and the changing of some of the water infrastructure and pumps. A part of these changes that she commented upon was how South Boston had improved pumping stations and subsequently became significantly drier. She was able to vividly show the extent and felt consequences of the change in the infrastructure as she described her past experiences with the water of South Boston. Images of South Boston are visible in Image 1 and 9. She explained how before her time, probably in the 1920s her mother's family had frogs in their backyard because it was so wet. Brigid told a story of how when she was young the streets were so muddy that one time her sibling lost a brand new shoe as it was sucked away in the muddiness. (Notably this was a big deal as shoes were expensive and seemed like an important moment for her). She further detailed how it was so wet when she was young that they could ice-skate in the park. With this descriptive anecdotal recounting, she not only paints an image of her encounters with the water system but instead exhibits

how she has used her experience to understand the insecurity she faced before and how she understands the infrastructural system. She was going to take me to show me where the changes had occurred and the new infrastructure but due to the arrival of a large thunderstorm, we were unable to. She maintained a level of information, which seemed informed but also supplemented this understanding with her own highly grounded experience with the water system. Herein, she was able to illuminate her understanding and be involved. With the information, her understanding of the insecurity or what can happen is better informed and nuanced.

Through these stories that span time, this chapter has explored how of time-space compression is felt, understood, and expressed. The stories of past water insecurities define the present understanding of the Boston water. This link with the past is therefore a critical component of the accelerated information that defines the compression within the system (Harvey 1990, 248-308). The following chapter will give an overview of how these past stories of water insecurity transition to what I refer to as water engagement.

5   Stories of Water Engagement

The present-day situation of the Boston water system is a result of the efforts of many, with multiple decisions made over time, both at a cost to some and providing great benefits to many. This chapter will explore how the water engagement occurs in Boston in the present day and will include consideration of public poverty, insecurity, and lack of trust.

Indeed, in understanding the role of the stressors on feeling of water security, it is vital to understand the way in which people interact with the available information regarding water insecurity. This chapter will also explore how the understanding of water accessibility and security is largely mediated through the role of information and active involvement. As such, stories of engagement with the system will be examined to track and elaborate on how this understanding emerges. For Eriksen, information is a vital component in the overheating process (Eriksen 2016).

This chapter, thus, is particularly concerned with how people interact and become involved with their governments, natural resources, and the world around them. Along with this engagement, emerges the ways in which people and institutions are engaging with the water system at present. As the chapter will highlight, there is tension in this engagement, because although Boston has relatively secure water, there remains a sense and specific understanding of water insecurity. The consideration of these forms of interaction and engagement incorporates engagement theories and how people participate in the societies of which they are a part (Uslaner and Brown 2005, Arnstein 1969).

Water has always been an issue in Boston. Through time Boston authorities have developed institutions and extensive legislation both for protecting and issuing rights to the water system. Boston citizens engage with this system and then explain in what ways they crave for knowledge, seek it out, and take action. Non-government agencies are another avenue wherein engagement occurs, filling in gaps between government and resident engagement.

Similarly, another component of this engagement within the system includes an exploration of certain countervailing processes, as considered in Eriksen's paper

(Eriksen n.d., 11). Specifically, these processes are comprised of the efforts that organizations such as the BWSC, the MWRA, or groups such as Clean Water Action work towards mediating issues and engaging with communities and their concerns about the water supply. These include government and non-government organizations. In this, is the work to deal with the threats of insecurity.

Ultimately, as this engagement occurs with a relatively secure water supply, the question of why this tension is still felt emerges. Thus, the water stories of engagement reflect the interconnected systems found with time-space compression as they link the interactions with the water resource between the various experiences (Harvey 1990, Massey 1994). In this sense, these water engagement stories become another intersection of understanding as individuals relate directly their water (Massey 1994, 154-5).

Participation

Theories of participation are useful to better frame the responses and provide additional insight and nuance. This involves the idea of how people participate in the systems, governments, and processes. Theories of participation explore the complex roles and dynamics in participation in the larger systems (Cornwall 2008, Arnstein 1969, White 1996). This participation links with the larger theory of overheating involvement and engagement are also linked with trust (Uslaner and Brown 2005). Involvement with concerns such as inequalities and environmental justice will be relevant as well in this portion and are present within existing literature (Pellow 2002). In their interaction with the government, people within the city of Boston have the access to interact with their Federal, state, and city representatives. Non-governmental organizations also play a significant role in the regulation and maintenance of resources and one can consider their contributions to and influence in the civil discourse on water issues in the United States (Dekker and van den Broek 1998).

5.1 **Knowing about Water**

An important element of the idea of how the information influences what people can do, know, interact, and perceive about water systems specifically relates to what kind

of information is available. This section discuss the types of information that are available regarding Boston water and how people might be able to learn more about their water. This then goes on to show how this might be significant and the resulting meaning. There are different kinds of information that are available and how it is developed and disseminated is an evolving system. The news and other similar media outlets can be sources of information about the specificities of a specific water system or providing a landscape of the water status in the country and the world. Major publications both broader and local could include sources like the *New York Times* or the *Boston Globe*. These provide one avenue for consumers to learn about information.

For general consumers and system users other official information available, both digitally and in paper, can be useful resources and are updated periodically. For instance, the website of the Boston Water and Sewer Commission provides various kinds of information from water rates, to contact, to service updates (BWSC 2019a, b). Recently, since this research began the website was updated and changed now with new resources and web connections. This type of Boston specific resource can be a useful informative tool for the local consumers to know specificities related to them. The MWRA website as well as the State and the EPA website also provide information on water and environmental protections (Commonwealth of Massachusetts 2019e, US EPA 2013b, 2015, MWRA 2019c). These could be resources that a water consumer might be able to access, initially, to learn more about the water that the city uses. The municipalities and the MWRA make use of pamphlets or mailers to explain the water quality and various concerns (MWRA 2016b). Two such pamphlets were sent regarding the 2016 and 2017 water results, in them there are explanations of the water source and the test results (MWRA 2016b, 2017). There is also further information regarding concerns such as lead and tips for good water use practices (MWRA 2016b, 2017). With these informational resources, the question concludes: Where is the information that people can engage with and how might they use it?

5.2 Craving for Water Knowledge

A critical question to examine in how people understand and perceive their water systems is also how they engage with these systems. The information that they use or connect with is particularly important to this discussion. With this information, how does this enable them to partake in the system overall (Arnstein 1969). Part of the information spreading is part of the system of interconnectedness (Eriksen 2016, Harvey 1990), but nevertheless, this information spreading also is part of larger "systems" or "regimes" of knowledge (Eriksen and Schober 2017a).

5.2.1 Value of Public Information

Residents and consumers seek out information on their systems through different channels and modes of communication. This information seeking, therefore, can be seen directly with the systems that are connected with the water. In the interviews, the residents commented on the types of information that they have acquired regarding their water and how. As interviewees discussed, with this information process they both are becoming aware of an understanding of their system and the concerns of overheating therein. These uses of information also indicate an involvement in the system.

Where Does the Water Come From?: Quabbin and Water sources

The source of the water was an important point of intersection in the discussion wherein the interviewees specifically reflected how information and knowledge about the water source influenced their understanding of the water system. With the knowledge, there is both added information, which can act either as a stressor or in contrast, as an alleviator for the stressors of water insecurity.

In slightly less than half of the interviews with consumers, the Quabbin Reservoir was mentioned. As the consumers brought up the larger of the two Boston water sources, they displayed their own knowledge and understanding, forming a sort of story of their own knowledge base. Knowing about this water source is an important piece of information for the larger water system and therefore, how people are engaging with their resources.

For some, they specifically highlighted how they possessed the knowledge of the water source. This relationship is one in the present, while linking with the past it focusses on the present engagement with the information. Brigid, who is long-time resident of South Boston, when first beginning and explaining her living situation and basic information, she explained that the source of the water was the Quabbin Reservoir. She later described how she has a good understanding and clarified that ground water is not used. She further characterized her understanding of how almost everybody is on the Quabbin, even calling the Quabbin a "Miracle of American engineering." With this description, she is putting emphasis on her own knowledgebase regarding the Quabbin. She is able to explain her understanding of this water source and thereby the larger water system. This type of active knowledge and recognition, as such, indicates also an involvement in the system.

Similarly, Ellen, a resident in Charlestown, also concretely displayed her knowledge of the Quabbin as a source of her water. As she explained that she was on city water from the Quabbin, she clarified "Yes, I know where." With this, she is not only displaying the knowledge that she has, she is also emphasizing pride in how she has information that might not be expected to be had. She further explained how she had visited the Quabbin and briefly went over the history of the Quabbin wherein cities and towns were flooded. She further elaborated on how there is a detailed brochure available when visiting the Quabbin. Here again, we see an acknowledgment and reflection upon her own active process and knowledge seeking activities. Further, in relation to the Quabbin she also remarked she was amazed that it was so hardy. With this information, she was both displaying an understanding and confidence in the understanding of the source of her water. Similarly, she also is able to show how she is using specific sources to formulate these opinions and knowledgebase on her water. Therefore, based upon her active involvement and information that she has gathered she indicates a degree to which she feels water insecurity or not.

Others stated some general thoughts on the Quabbin whilst also reflecting a knowledgebase of Quabbin as a source of the water for Boston. Rebecca for instance, praised the quality of the water from the Quabbin. For others still, the knowledge of the Quabbin and information therefore regarding the water source was more personal and anecdotal. Sue currently lives in the South End neighborhood of Boston;

however, about 6 years before she had moved to Boston from further west of the city. Sue explained how at her old house in Pellum she was just two miles from the Quabbin Reservoir so she had direct proximity-based relationship and understanding of this source of water. She also described how she "has known forever where the Boston water supply is from (at least part of it) and there were towns that were flooded in the 1930s." Therefore, she both displayed a long time knowledge with this water source but also the present experiential knowledge by being nearby. There is indeed a link with the stories of the past but also her present interaction with the source. Here again there is a distinct sense of engagement with the resource through information and assurance of at least what the water source is, if not mentioning specifically her thoughts on the quality as with some of the others.

Staying Informed

In addition to the more water source based information addressed in the discussion, there were subsequent points in the interviews that reflected a knowledgebase regarding the Boston area water system and broader water system complexities as well. With the additional information, the interviewees further exhibited an engagement with and concern for quality of their water and importance of an adequate system.

In her interview, South Boston resident Jessica displayed an understanding of a variety of the complexities existing within the system. As she discussed different histories and contexts of certain situations, she also brought in some critical analytic perspectives as well. For instance, she touched upon broader issues like fluorinated water but also the broader socio-political context of its introduction. Similarly, she addressed the market history of the ice industry and other current environmental concerns. With these insights and commentary, she analytically considers the historic implications and systemic interplay and is thereby, through analysis and information actively engages the system Furthermore, she also discussed information she knew about the Boston Harbor clean up and the Deer Island treatment facility. This represents the other end of the water system, the sewage treatment component, which is also a significant factor for the urban water system. The sewage treatment is particularly relevant as it contributes to costs and to features of the water that needs to be considered in assessing costs of introducing a water network. Also as seen in

the history of the system in the previous sections, what happens to waste, or where it is disposed, is a critical consideration. In addition, there are other considerations of other uses of water and how they help or hinder public health. By living in South Boston, which is on the coast, Jessica is physically closer to the water than some residents, so this idea of having clean water with beaches was something she directly experience throughout her life.

In the interview, Jean also referred to knowledge regarding the Boston harbor clean up and sewage treatment. Through this discussion of this information, Jean displays an important sense of involvement in the system and actively staying informed. Like Jessica, he seemed informed about other environmental issues in his explanation of issues from climate change to water shortages in other states and countries.

Similarly, Jean also displayed how he specifically sought out information and became informed as he talked about watching a video on water issues in Pakistan. He showed an awareness and interest to be informed about other places beyond the Boston water system. Here he gives a nuance where his concern and understanding are being developed by information to which he gains access about other types of water security and issues that may occur. Evidently, he is aware of many influences and pressures on water availability and did not focus exclusively on his own situation but rather extrapolated to concerns about broader society. Nevertheless, these broader concerns did feed into his concerns about his own water security. As this information comes from across the world, the globalized and accelerated information is evident (Harvey 1990, Eriksen 2016). This instance is a beginning example of how information is being used to engage with the world, yet it is this information which is coming from elsewhere as in the fast-paced environment is spreading and contributes to the experience of overheating and time-space compression.

Individuals mentioned a variety of informational resources they used. Daniel pointed out how he chose to look up information about the water quality when he noted some difference between his place in Cambridge and other municipalities. Ellen mentioned how she had received brochures from the Boston Water and Sewer Commission. She commented how "I actually read them," describing them as informative and interesting to read about the water quality. Rebecca also mentioned receiving similar notifications when living in neighboring communities of Medford and Watertown,

she mentioned looking at documentaries on Netflix on water issues and other video sources. As she discussed what she learned, she explained, "The more I learn, the more disheartened I am." Once more, there is a process of gathering information from educational and informative sources. This information seeking process nevertheless can be both the informative trust building information but it can also be negative for people's feelings towards the water as seen with Rebecca. Like Rebecca and Ellen, Jessica also commented on how she got information from the water bill inserts. Sidney similarly, discussed the literature that she receives from the MWRA and how she finds the water quality report cards interesting. As they are commenting on their interest in the information, they receive about the system, they are able to both reflect upon the available resources within the system but also reflect upon a personal level of engagement and involvement in the system. They are establishing a vested interest in the system as they take the time to learn about the water workings.

Some of people interviewed for their role as consumers also indicated that a knowledge base of information was acquired through more work based experience. For instance, Rebecca explained the system of water and elaborated how she had worked in an education capacity such that she was teaching students about the water system. Therefore, she was using this information gained in a professional capacity. So she has her own form of involvement with the water system (although she was interviewed as an individual consumer this still emerged in her way that she was involved with the system).

Jane provided an interpretation and explanation of water concerns and systems as related to her work with a group improving water in Bolivia. She explained that while she was not able to go to Bolivia, she had been part of student organization and that gave her experience with inequalities in water. Here she reflected on how this work helped her to understand how for some people having access to bathrooms is so easy. She also described how "water is such a basic necessity." She further noted the notion that certain groups such as women are more at risk. With her volunteer work, she noted further that she had an awareness of water inequality and also that even in US there are places where water is not as available as it could be. This perception of water insecurity in the US was grounded in her international connection and the

reality of water insecurity in Bolivia. Here the information of insecurity in water came to the forefront of the explanation based upon information that she had.

Jessica provided practical sorts of information that she has drawn up in her own water use. For instance she explained her understanding that people should let the water run for 10 seconds before drinking. This type of information directly relates to the quality of water she expects to come from taps, as letting the water run allows enough flow of the water to rinse out water with lead from standing in the pipes and is recommended in the literature from the MWRA and the Clean Water Action also indicated this as a method of harm reduction in the interview (MWRA 2017, 2016b).

Taking Water Action

Some of the aforementioned volunteer and non-volunteer work and activities that consumers discussed fell into how they were involved with the water systems. There are varying levels and forms of involvement in the system, similar to the varying levels of access to information. Indeed, it is important to note that at its core the systems are also made up of people. Some of the individuals mentioned local politics and water talks as well as the role of involving themselves in the local politics. In taking action, the role of participation is therefore also relevant (Arnstein 1969)

Some of the consumers in their interviews specifically discussed the idea of activism and how this seemed to inform their understanding of the systems and how they got information. Jean reflected on this type of consideration in his discussion of his knowledge about the issues. He brought up his work with and understanding of the Deeper than Water Project, which is working on addressing water contamination and human rights abuses in prisons, originating in Massachusetts (Deeper Than Water 2018/9). He reflected similarly along with this that he is not surprised by the issues since he is an activist. Here we can see the cross-over between the issues and concerns that are occurring at this time. Each concern is not isolated but instead interconnected with the other systems.

Sam also drew upon some of his activist and similar experience as he spoke about his water. He explained that he had reflected on these issues with others he had worked with in grassroots organizing on different issues. Likewise, he spoke specifically to what he saw as the role of grassroots organizing: "Grassroots are important as they

do not give reigns to someone else." Further reflecting on water and activism, he brought in some of the other water issues in the United States and ideas of the importance of "free and easy access" to water. He commented that is was a "Great way to motivate people to get involved in activist." Like Jean, Sam brings with these statements of his information, an activist understanding and knowledge base for the water systems.

The people and their water stories comprise an intersection in the overheated system, which is a composite of these interactions and overlapping forms of engagement and interactions. These interactions emerge with occurrence that while some of the people were contacted for their role as a consumer and Boston resident, some of their work and activities still connected with water more directly. Similarly, with the people who were contacted for their role as professionals, they too were individuals and a part of the system. Therefore, the lines sometimes do combine between this in the role of civic engagement. In the interactions there can be cross-overs and different definitions of groups (Arnstein 1969, 217). Nevertheless, the difference in the interview guide and framing of the interview is an important factor to consider in the distinguishing among the stories provided by the interviewees.

5.2.2 Information Lacking

Part of interconnectedness wherein information contributes to the understanding of the stressors and water insecurity includes stories wherein specific information is lacking. In this case, there is information surrounding the community members but there is a specific gap in this web of information. Some interviewees highlighted how they lacked certain information and also indicated areas where they might want further information. The lack of information adds a complexity to the understanding of their water where the people both have a comfort and a discomfort of the knowledge they have. Much like where some of the consumers were comfortable and confident with their knowledge-base, others wanted to know more including questions of water source, technical infrastructural features, and systems questions. In these cases, the accelerated information was incomplete, furthering concerns about the system and transparency (Harvey 1990, Eriksen 2016). Likewise, without complete information, there may be obstacles to participation.

Technical and Infrastructural Elements

Some of the interviewees had distinct questions about the technical elements or infrastructural features of the system. These questions show an engagement and curiosity about the world around them. The lack of information base seems to indicate their knowledge gap and points to an area of concern for the system.

One such technical element, wherein uncertainty and a lack of information were presented, was regarding the pipes. As mentioned before, while Sue knew the source of the water in that it comes from the Quabbin and Wachusett reservoirs she further elaborated that she sensed a lack of some information. As she explained: "who knows the conditions of the pipes," she clarified that she was sure or at least hoped they were monitored but still, she, herself, seemed to lack a sense of certainty and information on these pipes. She also had questions regarding the overall water infrastructure and where the effluence goes. Similarly, Dorchester resident, Denise also presented questions about the conditions of the pipes in asking how clean the pipes are and questioning how they stay clean. For both of these individuals the potential for information and lack thereof also appeared to be part of an uncertainty with quality assurance of their water system. This want of information adds to the overheating, albeit slightly contrasting with the theory but still somewhat related in this idea of the link between information and the understanding of system stressors. Likewise, they do have enough information to feel that they could know more. Brigid brought in further technical questions and remarked on some uncertainty with water pressure for buildings. This is the practical use element and relates to the ease of using the water that she gets from the system, something that can be easily overlooked by many if they feel water secure yet is critical for those experiencing water insecurity and scarcity. Questions regarding the internal make-up of the faucet also arose. The concern and information for the specific infrastructure, with a possibility of lead pipes also links informational spread eventually to links across geography to the situation in Flint, which will be more thoroughly discussed (Harvey 1990, 117-130, Massey 1994, 147, Eriksen 2016).

The Source Elements

Just as some consumers knew the water source for the Boston drinking water, others had questions regarding the sources. A story of questioning the water source emerged as several of the consumers expressed a desire to know where the water came from and how this was information that they lacked. While knowledge regarding the water source seemed to be, for some, an important point in informing their understanding, this also seemed to be a point of concern in its lack of information for others. The origin of this information lack, then becomes an influence in responses. Was this a point that they have not come across and if not why not? Speculation could be that they had not read or remembered reading a children's book as was in Jessica's case or perhaps they did not receive the brochures, as was the case for Ellen. This disparate receiving of information may cause issues in understanding and trusting a system due to a noticeable knowledge gap.

Broader Questions and Missing Points Regarding System Elements

Broader questions arose regarding the systems including questions surrounding the long-term water situation. Likewise, some of the lack of information was linked with lack of general information on their systems.

Sue expressed this feeling that she lacked information on her water system. She explained how she "doesn't have a good sense from Boston;" in contrast, she elaborated how in her previous home in Western Massachusetts she had received letters and news about the purity but not in Boston. This lack of information seems in contrast to what is available and what some of the other people had received. While knowledge made Sue more comfortable with her water in Amherst, the lack of information in Boston did not necessarily make her uncomfortable, but she wanted to know why it was not there.

Aria also mentioned how she thought there were measuring devices for issues like lead. Although she thought that such measuring did occur, she did not personally receive or review any information on the issue. She wondered about her own water in relation to others as she reflected on local issues. Likewise, Alice also explained that she did not have a lot of information. She too expressed a desire to know more about her drinking water.

As I spoke with Denise, she further commented on how she sees on TV cities with brown water but she does not know why. With this comment, she illustrates how she has a partial or incomplete amount of information and ability to engage sufficiently. While she is exposed to information about water threats via the television, she also does not have complete information about the actual system that is the cause of this. Therefore, she expresses confusion and concern not just about the community detailed in the reports, but also an uncertainty about her own water.

Others expressed a lack of information and resulting uncertainty about their own specific water. Sam lived in Dorchester and rented a room in a house. He had lived there for over a year and grew up in the Boston area. He explained how he was told by the home-owners to drink the water filtered. However, he was uncertain why that is and how it relates to the house that he lived in. He explained, how because of this warning he does, in fact filter the water that he drinks. Likewise, Rebecca talked about her experience living in government housing in Boston. She indicated that she could have done more research but still felt there was not a lot of information that was provided to her. Further details of Rebecca's specific experience and the issues therein are elaborated on with regards to lack of trust and equality in Chapter 7. Rebecca's story of her personal engagement is similar to that of Jane, who also acknowledged her lack of research into the water. For Jane, it was due to a concern that she would obsess over it and want to know a lot. Jane is evidently apprehensive of an "information overload" (Eriksen 2016, 117). This story again shows a lack of information but in this instance a purposeful lack of information because the role that the type of information can provide and the additional stress it might cause her.

A research note to consider with regard to information lacking was that sometimes in the process, participants would ask me questions about the water system and information based upon my research, viewing me as having extra knowledge and as a resource. This reflected a curiosity on the part of some of these participants. This also points to the idea of questioning my place as researcher and at certain points the understanding.

5.3 **Role of Mediating Organizations**

This section will examine how some of the non-governmental organizations engage with the water system and frame their own role in dealing with water insecurity. This will draw in Eriksen's idea of countervailing processes wherein the non-governmental organizations take on mediating roles in order to deal with the water insecurity.

The role and position of these particular organizations can be considered with regard to both how they engage with ideas of participation but also their role in the social movements and specifically in the space of the environmental movement in the American context (Arnstein 1969, Coglianese 2001).

The role that some organizations take is through the creation of reports on water issues. Some of these reports were produced by the NRDC (Natural Resources Defense Council) of the Unitarian Universalist Service Committee (UUSC) (Fedinick et al. 2017, Olson, Fedinick, and NRDC 2016, Jones and Moulton 2016). In two reports by the NRDC, they examine the status of water in the United States as well as the policies and water safety enforcement. The first considers the issue of lead contamination of water, moving from the case of Flint, and in so doing highlights where there are issues across the country (Olson, Fedinick, and NRDC 2016). A second report examines water quality, water violations and the Safe Drinking Water Act (Fedinick et al. 2017). These NRDC reports are important as the issues can effectively be seen on a national scale; likewise, they possess relevance and authority coming from such a large organization. Another report produced by the Unitarian Universalist Service Committee highlights the significance of another water security challenge in the United States, that of water affordability (Jones and Moulton 2016). These reports are available publicly and document water accessibility issues as they arise. These can be seen in a broad scope and guide understanding for consumers. These are often done by groups or organizations addressing these types of issues. These organizations create and publish information that can be used as a tool to mediate and navigate the water issues in a community.

An interesting point in the research process was that when speaking with the different organizations and individuals, they often recommended speaking to others

or points of contacts. This may indicate a level of interaction and communication in the water community. This brings in ultimate questions: what are they doing and what is their role in mediating the information and engagement?

One interview was with the local office of the organization, Clean Water Action. In this, they were presented as a drinking water advocate. There was discussion of their role in public education, with a specific focus on dangers and impacts of lead, even in low levels. They have been working with towns and communities in the Boston area where there are concerns for the water quality. Social justice was also a significant point of concern in their work with consideration of community demographics and specifically working with concerns for environmental justice. The representative explained how the organization also provides guidance and consideration. They explained the role of the organization as one where there is the possibility to be a "community advocate" where they are able to hold accountable water suppliers since they have time and resources. In this we can see the way in which, this non-governmental organization is able to take on a mediating role working to deal with the stressors (Eriksen n.d.). Similarly, the language of environmental justice and concern for inequalities in environmental hazard emerges as well (Rhodes 2003, Agyeman 2005, Pellow 2002).

In this position as an organization focusing on clean water, they had distinct interactions so as to achieve their goals. They mentioned their interactions with the communities, municipalities, and building of coalitions. There was also discussion of the way in which cost is a factor and the existing loan programs for changing out lead pipes. They even discussed the issue of language support and accessibility of information and documentation for those with English not as their primary language. With these discussions, there indeed was consideration of certain structural factors impeding access to clean water and involvement.

Another organization, that I was able to interview was the Massachusetts Global Action which created the Color of Water project. Their work aims to study the relationship between water shutoffs and the communities of color. They created a valuable report that pointed out the status of water shutoffs in the city of Boston (Massachusetts Global Action 2014). This study indicated how neighborhoods of Boston that were facing threats of water shutoffs were also those that were largely

non-white/ people of color. In the interview, they indicated their concern that "something as fundamental as water was cut-off." There also was the question of how is the city held accountable. Here one can see an evolution of the question of what is the role of governances and then other organizations and research. Their work has also involved working both with the city and community; for instance, more recently in September, 2015 they took part in talks (Massachusetts Global Action 2015). They explained their work collecting the data and the communication with the city to get such data. Since the initial report, there is an indication that rates of shutoffs have gone down somewhat, but they also indicated that there was still room for more research into this area. There was a distinct concern for "disparate racial outcomes." One can see how such a group has a focused and considerable impact. In the discussion, there was also a reflection on an interaction also with other groups, such as the Unitarian Universalist Service Committee (UUSC). Thus in this section, one can see how another organization plays a role engaging and dealing with the challenges of the water supply and social issues.

Another interview was with Laura, who works with an organization for the protections of rivers. Laura's work draws upon the environmentalist perspective in engagement. This type of work is also relevant in the consideration of what is the role of the rivers in the watersheds. This group again serves as a sort of environmental advocacy group and she described the kind of watchdog role that they take on. As mentioned earlier, the DCR of Massachusetts oversees the reservoirs, but they also manage the watersheds feeding them. Contributions from activists and those working for environmental protection, such as Laura, provide information in a reverse flow from outsiders to insiders of those who are in charge of the water resource. This group and the others with whom I spoke show this middle ground that they take between the governance organizations and the people or environment.

The interview with John, a professional with specialized knowledge of water affordability provided unique insights into another form of engagement. This position could also represent a specialist group that gives consultations. Amongst the different things that John does, he provides consultations and information regarding water shutoffs. In this role, he is able to engage with the water system by providing an expert knowledge in a field to provide assistance and address a specific concern.

Evidently, the non-governmental organizations are able to fill a role as they engage with the water resources. The information provided by the interviewees points to the mediating role that these types of groups and individuals perform through their work and actions. Clearly, they manage to mediate the compressed systems.

5.4 **Role of Governance in Dealing with Populations at Risk**

This section moves on to explore how policies and governance have a role with interacting information by mediating the stressors of water insecurity. The data in discussion was gathered from several interviews, some with individuals with government or semi-government experience and other who have knowledge of government processes. This examines the stories of engagement with the water system via the government processes.

Within the existing literature there is strong thread connecting the ideas of water access and commodification with questions of law and policy. In understanding the systems and possibilities of insecurities, it is also important to consider the existing institutions and their roles. The inclusion of policy relating to understanding mechanisms and finding solutions can be seen in Bond and Colton (Bond 2008, Colton 2005). Moreover, a report from the University of North Carolina also looks into the multilevel and layer management of water in the United States and differences between states and management practices and policies that exist (University of North Carolina Environmental Finance Center 2017). This issue also appears to be one, which concerns law, as there are sources and discussion originating from law schools and law institutions (Georgetown Law Human Rights et al. 2013, Arnold 2009, Bond 2008, International Human Rights Clinic at Santa Clara University School of Law et al. 2015). In addition to the role of law, there is also specifically a discussion of the role of governance and water management (Frérot 2011). Therefore, the lens of policy and the possible implications of that are incorporated into the discourse.

5.4.1 Policies as Tools

Part of the role of government in engagement is through policy. There are policies that work to protect water and act in ways to deal with the water and relevant information as well as ensure provision of water resources. This sense of policy having the potential for an impact as a mediating factor to deal with water insecurity was reflected upon in some of the interviews.

At a fundamental level throughout different scales of the governance and implementation there are policies that are intended to protect water and protect people. In the interviews, different scales of policy were mentioned as being significant or having some form of effect on dealing with the possibility of water insecurity. Here an interplay of scales emerges (Eriksen 2016, 131-156). As mentioned by many in the interviews, there are federal protections, such as the Clean Water Act, that can have an influence on water protections. For instance, as the professional with MWRA experience explained this federal protection of the Clean Water Act was a fundamental reason for the creation of the MWRA specifically as an entity. Another area that was addressed by the individuals from the Federal Agency was environmental justice policies. They pointed out how there are differences at the federal level and state levels with protections under different environmental justice policies. With the discussion of the various policies, there is the idea that there is a place for the policies in order to mediate what is going on with water insecurity. This mediation can act as check on water security in the United States.

At the state level of governance, certain measures were also noted as significant. The state policies influence the state of the water situation and are important for how this level of government can affect change. For instance, Christina highlighted the importance and significance of environmental and water policies such as SWMI (Sustainable Water Management Initiative) and the 2004 Water Policy. Resident Jessica also indicated this confidence in the local processes of water protection, while expressing some doubt at the national level of protections at the present.

Nevertheless, in this engagement there can be challenges. Sometimes these policies are not fully achieved but have the potential to improve situations. John, a water professional, provided insights into how local policy and implementation can be

critical to ensuring that people have water available to them in their homes. The local levels of policies and implementation are also where this could be considered. With water affordability, comes the challenge of water being shutoff. John, the water professional, explained how it is possible to make water affordable and mechanisms can be adjusted to the needs of the communities. Here at a municipal level policy, it can be implemented to moderate when payments happen or do not. He explained how fiscal analyses can help determine the correct policy to incentivize responsible use and payment and make possible that people can pay their bills and ultimately not harm the city or the individual. In this area, there is the potential of policy implementation and a sense of possibility for dealing with an issue of water insecurity.

Likewise, with governance there can be a moving effectiveness of certain policies. Christina highlighted how which policies are the focus can shift. She also noted how the roles and programs with highest priority of government officials at the city and different levels depended on which individuals were in those roles. Therefore, with this we can see the target and effectiveness of the various roles of governance, their policies, and how these can fluctuate.

5.4.2 Engaging in Interactions with Other Mediating Groups

Another key part of the role of the governance is related to the interactions with other groups and the role it takes in the mediation process. This interaction is a fundamental part of the intersection of the water stories and the way in which they are part of the overheated system. This role in governance relates precisely to the how there is information sharing between scales and types of agencies and subsequent interaction, so that they are able to function. In this interplay both information and scales collide (Eriksen 2016, 117, 131). Therefore, the present government engagement is comprised of interconnecting relationships and interactions with other groups.

In several of the interviews, there was discussion about what kinds of interactions occur with other agencies and organizations. Individuals with government knowledge brought into the discussion, how non-governmental agencies interacted

with governance and had role in the water security understanding. Specific goals of different organizations were highlighted.

Interviewees often discussed how multiple government and semi-government agencies work together. Indeed, there are varying scales of government that relate to water use and security. Similarly, there are different types of agencies that interact. The coordination of this mediation requires much interaction and non-isolated functioning. Therefore, as interviewees described these varying scales and types of interaction they highlighted the way in which governance works in complex systems as an element of the mediation and information sharing in the community.

The MWRA is one such "public authority" and thereby connected to the systems of governance that make up mediating factors for water security. In the interview with a person with MWRA experience, the significance of the interactions with other layers of government and agencies was recognized. They elaborated how the formation of the MWRA originated from state legislation and how there is ongoing interaction with the state government. They highlighted how there were partnerships, communication, and meetings with state level people. They also discussed the interaction with federal levels, such as the EPA and abiding by the policies and standards herein.

Furthermore, this interview characterized the MWRA as having frequent communication and interaction with local communities and municipalities. For instance, the professional explained specific monitoring of the water levels and how they coordinate with other agencies if there are leaks. However, he also explained there can be challenges with politics at the local level still but communication and cooperation continues.

Another such intersection was with health agencies. This was a point that several of the interviewees touched upon as well as interaction with other types of agencies. The office of a congressman explained how they would work with organizations like the EPA. Similarly, the Boston Water and Sewer Commission also pointed to working with the MWRA and other departments such as the highway department to coordinate water and other work projects. Likewise, federal agency workers spoke

about working with other federal agencies to coordinate materials; they work with community groups and with States to also get programs accomplished.

Clara, an individual in Connecticut with water governance experience similarly highlighted how the state agencies worked with federal agencies such as the EPA and local municipalities. With this reflection on interactions, it becomes evident how the role of state government in a neighboring state is important in understanding water resources of a region.

Amongst the stories of coordination with other departments, also was a discussion of working to direct the public to the correct agency or contact person. Indeed, we can see how there is acknowledgement and intertwining connections between agencies and organizations. While the individual agencies may be clear on their role, to the unassuming consumer, this multiplicity of responsibilities could present itself as a morass of bureaucracy furthering the stress induced by concerns about their water.

5.4.3 Working with Communities

A significant aspect of the role of the government and quasi-government agencies is how they specifically interact with the water consumers and community members. When examining this level there can also be consideration of the efficacy and the levels of participation that these interactions involve. With the idea of providing information, this can beneficial but also depends on the how it is presented and the power dynamic exhibited (Arnstein 1969, 219). To another extent, this interaction could be viewed with regard to how it relates to formation of partnerships (Arnstein 1969, 221-2).

Forms of Community Interactions

A feature of the roles for governing agencies that emerged in conversations was how there is community involvement and interaction. The interviewees elaborated on the ways in which this interaction is characterized as government and semi-government agencies interact with the public and communities.

This community interaction takes on the form of how government groups hear from the community members. This specifically can be seen with elected officials and how

they interact with and hear from their constituents. One state senator explained his role as to "make an impact through legislation and interact with agencies that might pay more attention to him." The offices of two elected officials indicated that they had not heard of any major issues concerning water insecurity but did hear about issues generally from their constituents. One specifically, clarified that if there were major problems with the quality of the water then the constituents would be contacting her. Similarly, Clara from Connecticut also expressed how sometimes people would reach out to the state organizations as did Alex, the professional with MWRA experience indicated this community engagement.

Christina, a water professional with some government knowledge, also noted some of the complexity as the governments navigate how the different wants and needs or tensions with people using the resources. She also highlighted how certain communities tended to get involved with the legislation. In the discussion regarding the work of MWRA, water professional Alex, noted that different groups have different priorities when it comes to the resource of water so working with that requires some degree of diplomacy. Here we see the interaction and the governance doing a job but also the ways that information and priorities can be passed between layers.

The role of meetings is also a form of interaction with community members. The individual from the BWSC explained how they would come to local community meetings, and in this way it could be viewed as a method to engage by being present there. This also can include opportunities for more practical situations such as allowing people to pay their bill directly. Those from the Federal agency also discussed this idea of meetings and inclusion with the idea that there "can be more chairs added." This idea can link with the idea of participation and a way in which they are actively seeking to overcome larger obstacles that may hinder participation and involvement such as exclusionary practices or lack of information (Arnstein 1969, 217). This language of inclusion and involvement by the community members, again, indicates an avenue for involvement and eventual trust building.

The Process of Sharing Information and Understanding

Linked directly with these varying kinds of possible interactions is that often contained within these interactions is also a process of information sharing. In this process, consumers learn about their water, their resources, and their rights from the government related bodies.

The use of different communication mediums is critical for people to know more directly about their water and the resources. This type of information includes clarifications and overviews specifically about the regulations and policies. This type of information was that which representatives and professionals pointed to as important informational resources. The overview of some of these was examined in the previous chapter.

The individual with MWRA experience, Alex, discussed in detail some of the kinds of outreach and information sharing in which the organization participates. They explained how the MWRA specifically uses the website as a means of communication on the topics relating to water. They explained how they give information about the MWRA water but also about water issues that may be occurring elsewhere. In this way, the public (semi-government) entity is utilizing its website as a means of information sharing. The interviewee frames it such that stressors are mediated through the information process. They also discussed the role of the informational brochure type resources with the use of drinking water and waste water mailings. They explained how these were sent to everyone who is in the MWRA water system. They elaborated on some of the complications with this in that there could be problems in how to distribute the information. For instance, they explained one option is to have some form of note on the water bill, but not everyone receives a water bill if they are renters, since water is often included in the rent. It is for this reason, they explained, they would distribute water information to all the residents. This type of widespread distribution and aim for such can be seen as a mediator of informational lacking to provide a sense of water security. As noted earlier, these mailings were one resource that consumers both commented on liking receiving and others wished that they would receive something like this, indicating they had not known or perhaps had not received them. In these two ways, with the

website and the mailing, there is information that can be accessed by many consumers.

The professional, Alex, with experience at the MWRA brought in another layer of the information sharing work in that they will go out to community events and have people drink the tap water. By doing this, they show the public that the water is safe and that they can drink. During these sessions, they are teaching the people directly about the water and of what it is comprised.

Going directly into the communities, can also be seen with the Boston Water and Sewer Commission. As mentioned before, the professional from the BWSC explained how they go into the communities and attend meetings. In this form, they both are a means to give people direct contact with the water commission but also can be seen as another form of information sharing process. At the meetings, the people are able to learn about their water and what is happening with the waterworks including expansions, replacements and general status of the system.

Another factor of outreach is having people know what they have rights to, protections, and processes of empowerment. Clara, the water professional from Connecticut explained the ways in which communities can learn about what they have the right to know. This includes the idea that disenfranchised communities might be able to feel they have the same rights to find out about the safety of their water.

In a similar way, the individuals from the Federal agency spoke of how people can become involved and the roles that they take. They highlighted how there is work directly with communities from bringing in technical understanding to working in schools with children for preparedness issues. They framed this kind of work that they were doing as a means to empower people and bring more people into being involved. They commented on how there can be issues that some groups such as low income populations might not think that they can be involved, but instead, they highlighted the importance of empowering people. They focused on this role of community input and perspectives as well as different means of education, access to the process, and ability to participate in ways such as in the roles of citizen scientists. In this sense, again, we can see how the barrier to participation and managing of

resources can be mediated as government agencies recognize and work to overcome the barriers such that people might be able to have a voice about the issues that they are experiencing.

5.4.4 Resources and Research

A final layer to consider in the role of governing agencies and their engagement as linked with the information sharing process and the mediation of the water insecurity stressors and relates the types of specialized work that government agencies can do. Governments and agencies have resources to resolve issues and determine what is happening with water: the supply, quality, and demand. These types of resources that agencies have can vary depending on the level of government.

Indeed, government agencies are able to gather and have available useful information regarding resources in their purview. Testing is one method of information gathering that government agencies might utilize to mediate insecurity. For instance, Christina highlighted the recent expanded effort to test for lead in schools. Similarly, water professional Alex, elaborated on how the MWRA performs testing of the water for the entire region thereby relieving the towns from individually doing all of the tests to ensure the quality of the water.

Along with testing, agencies can have of other important technical information and industry/scientific updates. The Alex also explained how the MWRA provides support for the different communities with other technical details, monitoring, and resources for filling informational gaps. They also elaborated that they work to ensure the chemical properties of the water for instance so that it is not corrosive thereby preventing lead from getting into water even if present in the pipes.

This is a particularly relevant point because it was the result of such an omission that the citizens of Flint have had such devastating problems, leading to increased levels of stress even in the Boston area as will be discussed in the later section.

With these and other examples, it becomes apparent how the agencies and professionals reflect on their abilities to effect change and make impacts through the specific kinds of resources that they would be able to obtain and share.

Another consideration is the role of scientific and technical knowledge in the processes of dealing with water security and those in which governments can have a role. Christina highlighted the shifting focus in which issues are considered or prioritized such as the PFOS and PFOA, chemicals than occurs in products like raingear, other concerns on effects and systems.

The various professionals also can have the resources to assist each other. The individual from federal agency explained that they were able to provide tools for communities to become involved in the water issues in their area and have information about their water. Financially, governments can also provide resources for improvements. This is evident as the individual from the Boston Water and Sewer Commission explained how there is funding for removal of the lead pipes. Thus, the BWSC frames a role of having resources to assist with the changing of pipes for safety. Thus, with the government engagement, the various scales interact forming the intersection of the engagement.

Indeed professionals are an integral part of the intersection of water stories of engagement as they actively and conscientiously take part in the water system regularly. The stories of the engagement by the residents also reflect this system of engagement wherein, they are able to meet at this intersection and engage with a reasonably secure system but still have reflections, concerns, and questions. The various players within the system locate themselves and their engagement through their water stories. Interestingly this engagement also locates people and their experiences within a larger historical and as the next chapter will also show a larger geographical area.

6   Stories of the Present: Water Stories Across Space

This chapter explores how present water stories evolving in other places in the US, and even the world, have an impact on how residents in Boston experience water insecurity. In other words, water insecurity experienced elsewhere becomes a felt and influential reality also in Boston. This geographic intersection compresses the experienced pressures and thereby help inform understanding.

In his book, Eriksen focuses explicitly on mobility as one of the main factors of the overheating processes in the world (Eriksen 2016, 58-80). Social relations are stretched over large spaces and people are constantly on the move. This type of movement is even evidenced in movement for work. Some workers travel long distances or even cross state lines for work: the top state in the country for is this is New Jersey where over 396,000 people cross states for work and amongst the top 15 in the country is New Hampshire where over 85,000 people work in another state, the main state being Massachusetts (McKenzie 2013, 11) Hence the acceleration of labor migration is crucial as is tourism (Eriksen 2016, 58-80). People take information and knowledge and are informed of events and knowledge from distant places. These are processes that can be conceptualized as time space compression (Harvey 1990, Massey 1994) or a clashing of scales (Eriksen 2016). As the mobility brings together the water stories of elsewhere, the experience of Boston once again becomes an intersection of these places.

Boston and Mobility

Mobility in Boston is valuable to consider. Tourism, one facet of Eriksen's overheating, is a major industry in Boston (Lonely Planet 2019a, City of Boston 2019b, Eriksen 2016). Boston, therefore, has this distinct link to other locations and movement of people engrained in its systems. Massachusetts also has many universities and colleges which will bring students from across the country and globe, with as many as 130 non-profit universities and colleges alone (U.S. Department of Education 2019). Some of these are particularly well-known and acclaimed such as Harvard and Massachusetts Institute of Technology (MIT) (Times

Higher Education 2019). For instance, in 2018, there were as many as 68,000 international students in Massachusetts and many other students who moved from other states (Institute of International Education and U.S. Department of State's Bureau of Educational and Cultural Affairs 2018). One major Boston based university, Boston University had as many as 9700 international students alone in 2018 and another Northeastern University had over 14,000 international students (Institute of International Education and U.S. Department of State's Bureau of Educational and Cultural Affairs 2018).

In addition to the students, these institutions of learning also attract professionals and scholars who become affiliated with them. Therefore, with such a presence of higher education institutions, there are people moving to the Boston area and increasing the mobility. Likewise, a function of the United States government system is that generally people from one state have the right to live and work in another state without needing to apply for a new residence visa. With this type of mobility, there can be much movement between states; for instance in 2017 in the US there were over 7.4 million people changing states of residence and in Massachusetts alone, there were over 146,000 new people and in 2016 over 149,000 new people (U.S. Census Bureau 2016, 2017b). Likewise, across the various neighborhoods of Boston there are wide variety of countries of origin (Boston Planning & Development Agency, City of Boston, U.S. Census Bureau: 2006-2010 American Community Survey, et al. 2019). Mobility and movement are thus significant, I would suggest, in relation to how people experience their place in the world. As such, when people move and experience other places, these other places then become within their realm or part of the baseline of their understanding. Moreover, people have the ability to move or do physically move between places where water, access to water, and water quality is not the same. So even while using the Boston water system, people relate to, reflect, and discuss the stressors of other systems as being part of their own system. Sometimes Bostonians also acknowledge personal privilege as advantageous compared to issues of water security elsewhere.

The role of comparison was critical in the study of how people talked about water security in Boston. Participants drew upon experiences elsewhere. With frequent movement of people, the understanding of variance in water security elsewhere

became important for how people in Boston understood their own water situation. These kinds of population movements could be for the individual or with family and/or other personal links. A point to be made is that through these movements people discussed their own Boston water in light of other experiences. This comparison also existed on multiple levels or scales such as global, national, local, and of course the scale of the individual.

6.1 Comparison to Local systems

6.1.1 Local Massachusetts Communities

Massachusetts, as a state, is reasonably small physically, as is the Boston area. Nevertheless, they are comprised of many communities near to one another. With this proximity, there is an increased possibility of mobility between these communities both for living situations, education, and work. In being near to each other, some of the communities share certain infrastructural features, while others do not. Water is one such feature with varying degrees of infrastructural overlap. The towns and cities have their own water authorities and they can get water from different sources. The MWRA, which provides water and sewage treatment for Boston, is also the main water supplier for some nearby communities to Boston such as Quincy, Waltham, Somerville, Belmont, and Brookline (MWRA 2018). Other nearby communities such as Woburn, Cambridge, and Lynn, do not share the MWRA as a main water supplier (MWRA 2018). Local handling of water such as pipes in the town are managed by the town/city/municipal water authority so there still can be additional variance in different factors.

Some of the interviewees spoke of the time and their experiences living in various non-Boston, Massachusetts communities. Many of the interviewees mentioned other neighboring communities where they have lived and moved between, reflecting this local based mobility.

In her interview, Jessica brought in a perspective regarding politics and community dynamics based upon her time growing up in the Town of Plymouth, Massachusetts, a town approximately 40 miles (65 km) from Boston. Here she experienced a different type of municipal water system structure. She explained how people in

Plymouth were both on well water and town water, although neither is part of the MWRA. With this system, they encountered some issues with politics and funding surrounding the town water system. She shows how in moving, even between nearby municipalities she has an understanding of how there can be conflict and confusion around water sources, funding, and infrastructure. Boston area resident, Daniel discussed moving between neighboring towns of Brookline and Quincy, also both on the MWRA system and not noticing differences. This recognizes an acknowledgement of the different types of systems but also some similarities in shared systems. Moreover, Sue explained her experience upon moving from the town of Pellum in Western Massachusetts to Boston. She noted how the Pellum and Boston water came from different reservoirs and that the water in Pellum was very hard and thus could be harsh on appliances and similar issues. The Boston water she explained, in contrast, was not as hard and tasted fine. She did clarify that she still did use her fridge filter, so she was not using the Boston water with complete lack of hesitation although not a severe concern. Once again, it is clear how this idea of mobility is influencing her understanding and perception of the Boston water by comparing to that of Pellum.

Other interviewees had general reflections on some of the other Boston area communities in which they still have a somewhat close contact. Ellen expressed concern with what was happening in two nearby communities. She explained that she "can't believe in Lawrence they drink the Merrimack River" and also how in Andover, they had drunk from Haggetts Pond reservoir but because they have grown now they pump from the Merrimack River. In contrast, she had expressed how she really liked Boston water and this statement can be seen as a point of comparison. Here she indeed has expressed how she was troubled by the source of water in neighboring communities.

Jacob, who has both lived in Boston for many years as well as surrounding communities, commented on the common source of the MWRA that he has experienced moving between the town and cities. He also mentioned how he had lived in Woburn, Massachusetts which had a bad reputation because of the prevalence of cancer occurrences as illustrated before which were tied to well water

pollution (Harr 2011). Here is also acknowledging the possibility for the similarities or differences between the communities and their water sources.

Some pointed to how there were the non-MWRA communities and affluent versus non-affluent communities. This will be elaborated on later with the idea of injustice as well. Their understanding and illustration of the water system is based on a comparison and therefore, will be linked with the later section related to trust and injustices or inequalities.

At this point, I should again acknowledge my position as a researcher. In some of the interviews, some people with whom I spoke during the research knew the town in which I grew up. This knowledge arose largely based on the network of snowballing connections used to find interviewees and further explanations to interviewees about my connection to the Boston area. Therefore, at points, my town was mentioned as point of comparison. This town is part of the MWRA system of water and for this reason does seem like a relevant point of consideration and comparison for understanding. These comparisons however, may more exhibit the knowledge of me as a researcher and a point of reference that people assume I would know. Some of these comparisons could be similar to other small towns in the MWRA system as well.

This geographic mobility within the Massachusetts allows for nuanced understandings of how systems function but adds to the experienced pressure. This local scale is further illustrated with the neighboring city of Cambridge.

6.1.2 Cambridge

Another local Massachusetts comparison that was particularly notable was that to the city of Cambridge. Comparisons to Cambridge water were a frequent element, wherein interviewees often indicated a preference for water from Boston to that of Cambridge. This pointed comparison is particularly significant for several reasons that further illustrate the types of relationships people form relating to the stressors and their own water.

A critical component of the comparisons made between the two cities is that there is a high degree of mobility between Boston and Cambridge. Indeed, there are

connections between the two cities, although they maintain certain distinct administrative differences, the water system being one such different system. The first connection between these two cities is their geographic proximity. They are bordering cities with often just the Charles River as separation. Likewise, they are connected by the public transportation, increasing the potential for mobility between the cities. One major subway line, the red line, moves directly from Boston to Cambridge. There are several ways of using just the public transportation system to move between Boston and Cambridge including buses and trains. This distinct geographic and practical connection can be understood as even on the "Downtown" map from the MBTA it lists hubs both in Boston and in Cambridge (MBTA, Dumas, and Central Transportation Planning Staff 2018).

Other features of the connection include that certain institutions have locations on both sides of the river, for instance Harvard has locations both in Cambridge and in Boston. Therefore, while moving within the same institution one might cross the city borders. Moreover, the Charles River can be walked across even by foot on one of the bridges.

Furthermore, there are popular restaurants and cafes on both sides of the river (Lonely Planet 2019b). As drinking free tap water in restaurants and cafes and going out to eat are both typical/popular behaviors of people in the Boston area, it is likely that people would have tried both city's water. As in other communities, people will move between the two for living, work, and school. Therefore, moving between the two cities is an ordinary and common occurrence.

While Boston uses MWRA water, thus coming from Quabbin and Wachusett reservoirs, Cambridge only uses MWRA water in emergencies and otherwise has its own water source (MWRA 2018). In the interviews, there was not often mention of specific knowledge of this differentiated water sources, but acknowledgement that they were different cities. Instead, the observations and comparisons appeared to be more based on personal experience of comparison of the water itself.

In a portion of the interviews with consumers, wherein their own drinking water was discussed, they brought up the comparison to Cambridge water as being of a lower quality than that of Boston. Therefore, there was a general sense in these interviews

that the water in Cambridge was not as good as Boston water. Both Leah and Sally commented how they "noticed a difference" with the waters taste and related quality. They also commented specific aspects of this in relation to how they have experienced the water. Sally specifically thought that the Boston water had less of a mineral taste and Leah found the Boston water colder. Likewise, Jean commented how the Cambridge water was "much grosser." Here, with access to a nearby other system the consumers of Boston water were able to frame an understanding of Boston that it is better than Cambridge water. Therefore, the understanding of differences in water quality is informed by this ability to move easily between these systems.

In two specific interviews, the water consumers explained in more detail what the noted differences meant for them personally and their resulting practices. Jane who has lived in both Cambridge and Boston described how she thought Boston water was better than Cambridge. She described her perception of the Cambridge as being saltier. As she elaborated, she also noted how she had not noticed initially the difference per say but one of her co-workers is very against Cambridge water and now she notices it. The way in which she described this adamant view of her coworker shows a distinct feeling towards the water which she has both witnessed and evidently begun to incorporate to some extent. Sidney works in Cambridge but lives in Boston and describes the water in Cambridge as chemically tasting. She explained how she fills up her water-bottle at home before coming to work, showing me the water bottle, which she has with her. With this, we see how these individuals now have actives processes and choices surrounding water practices because of this noted difference in water and movement between the systems. Although availability was not an issue in Cambridge, nor was the safety of the water in question, there was a sense that the water quality was inferior.

There is significance in that that people do observe a difference in the water when there is indeed a difference. This access and mobility provides a direct and simple comparison that people can make. While these differences are smaller than the significant concerns other communities face as per the comparisons with the severe contamination in Flint, their mobility is a point of connection, which allows for their

comparison and corresponding understanding of the water system and the privilege of the Boston water.

6.2 **Comparison to the Country/ Nationally**

Mobility and the interconnectedness with the ideas of insecurity exist at other scales existing beyond the scale of the individual. The relationship between the mobility and expressed sense of insecurity was therefore also seen in the comparison of local Boston water to that of other water systems within the United States. The participants told water stories that related their understanding and relationship to the Boston water system directly to locations, and problems, which exist in other parts of the United States. These instances often also highlighted benefits of the Boston system by comparison and noted a type of privilege. Nevertheless, they also displayed recognition of the pressing reality of possible water insecurity with troubling cases existing in other locations in the United States. Some of these experiences relate to high media profile cases while others relate to personal experiences. Because there is a degree of mobility and connection between the states in the United States, the fact that interviewees discuss these locations reflects an interconnectedness between places and understandings and scales. I will suggest in agreement with Eriksen that mobility, as a result of a sort of spatial compression, causes places across the United States to become important for the place where one is. What is going on elsewhere as related to water insecurity and therefore the stressors of this directly link with a local experience of the Boston water.

6.2.1 Flint Michigan: Disaster and Connection to Boston

A story at the forefront of in the fall 2018, concerned with water security in the United States was that of Flint, Michigan. As noted earlier, the story of Flint is one that spans over several years and the fallout from it continues still today. For this largely low income and minority community, the major issues began in 2014 when the city switched their water supply to that of the Flint River as a money saving measure (Kennedy 2016). With this switch, a number of major issues emerged (Smith 2015b). Initially it appears there were concerns for the water quality by the residents with the new water (Smith 2015a). Soon some concerns were verified as E.

coli was found in the water (Kennedy 2016, Smith 2015b). To deal with this water quality issue, the city added large amount of chlorine to the water such that the byproduct trihalomethane became too high (Smith 2015b, Kennedy 2016). At high levels this chemical is also dangerous to human health, and Flint was violating the Federal Safe Drinking Water Act (Smith 2015b, Kennedy 2016).

Lacking in the city's plan was another major significant measure: that of dealing with the corrosiveness of the water (Smith 2015c). Without having a corrosion treatment plan, plans which are fairly standard practice, the pipes began to corrode causing lead to leach into the city water (Smith 2015c). This resulted in extremely high and dangerous levels of lead in the city's water and thus posed considerable health threats to the city residents, particularly young children (Smith 2015b, NRDC 2019). In fact, a local doctor brought attention to what was happening as she treated increasingly more children with greatly elevated lead levels in their blood (Smith 2015c, Walters 2015).

As the water in the city became deadly, media coverage brought the story beyond the city and state limits. With the coverage, a vivid picture began to form. Stories in the media recalled individuals' experiences with Flint's water; images show the brown-orange discolored water in bottles (Smith 2015a, Walters 2015). The other captivating image was that of crates upon crates of bottled water, the way for the people of Flint Michigan to be able to safely consume water (NRDC 2019).

Furthermore, with Flint becoming a symbol of poor water management and extreme contamination by this point, the media also used Flint as a starting point for other discussion of lead contamination. Although the specific events resulting in the situation in Flint have some uniqueness, it has become known that lead contamination is an issue for some water supplies across the United States as other communities also face significant other issues with lead contamination thereby progressively undermining a sense of trust (Olson, Fedinick, and NRDC 2016, Pell and Schneyer 2016). Therefore, Flint helps to illustrate a broader concern that can be felt and understood at a national level. As the information spreads across the US, Flint embodies a sort of spatial compression in that Flint, although geographically far, spatial compression is perceived and discussed, and its messages of vulnerability and insecurity are also then experienced.

In my interviews in Boston, Flint was a significant linking point of comparison. This brought together these processes of mobile water stressors, as the stories travel from other parts of the United States. The Flint case is particularly significant because it became an important point of comparison for several of the interviewees. Indeed, the continuing and highly problematic concerns in Flint became important for those who live in Boston.

For the interviewees, Flint was close enough to be a reality. The case of Flint and Michigan was brought up in about half the interviews. It was clearly on the minds of many of the participants in the interviews. Flint was a topic that was addressed in the interviews with both professionals and with Boston residents. As noted earlier, due to the age of the buildings in Boston, lead remains in some pipes and the fear of it leaching into one's tap water became more real after flint.

Some professionals with varying specializations addressed the significance of the occurrences in and the relevance of Flint, Michigan. Generally, when the professionals discussed Flint, it was without a strict explanation of what had happened there. While there had been more detailed explanations of other things, this indicated that it was a point of reference that I, as a researcher or a person, should already know about.

In some ways, there was discussion about how the case caused action or some form of change. For instance, a water professional, Christina, pointed out how a response after Flint was that there was further testing for lead in schools in Massachusetts. In this instance, there is an indication that Flint is relevant beyond the city and state confines. Likewise, it further indicates that significance of this case of water insecurity did influence concrete actions and concerns. Similarly, Alex with experience at the MWRA explained how there is a global conversation and interaction surrounding water issues and lead particularly with the case of Flint, Michigan. Likewise, he explained how important issues of lead are. Once more, this professional acknowledges how this high profile case has had a far-reaching influence and significance. In the discussion of the MWRA water explicitly, the anti-corrosive measures were also addressed, these measures can be also framed in comparison to the lack thereof in Flint.

Another water professional, John, with a specialty in water affordability, further commented on the broad attention with Flint. He explained how people were looking to Michigan because of the water in cases both with Detroit, which was experiencing a high number of water shutoffs, and with Flint. With this instance, during a reflection on water he was able to highlight the larger significance of these cases. In his discussion, he also brought in some personal experience. John recalled the story of his personal experience with the Flint water. He had recently been to Flint and explained how: "you can't just go to the tap and think about poisoning yourself." He further elaborated on how when he was in Flint and someone went to the tap and turned it on, they found it strange. He described how they would stare at it and wondered if it is safe to drink. Evidently, having traveled to Flint, Michigan he has the concrete experience of questioning water security. The mobility of people in the overheated world intrinsically shapes the understanding of the local water systems.

With a final instance in the professional context, the significance of Flint was described more strictly as a point of comparison. Jillian, from the office of a congressman, explained how in the office they had not encountered major complaints from constituents regarding water quality; however, she noted that she was "You hear what happens out in Flint […] and other communities […] it's a relief that we don't have that, that our constituents don't have to worry about something like that." In this moment, the interviewee uses the severity of the situation in Flint as an illustration of the degree to which water insecurity can reach. In comparing, she clarifies what the water security therefore does not consist of, in her professional experience, in the Boston area water system. Thus, for the professionals, the story of Flint was a water story at the intersection of their interaction and a component of the overheated and compressed system in which they take part.

Residents from Boston also used the story of Flint, Michigan to characterize their own understanding and relationship with the water systems they encounter and map their intersection. Like Jillian's example, some of the discussions of the issues that were occurring in Flint were comparisons highlighting the extent of water insecurity that can exist, but what does not exist to the same extent in their experience of Boston water. The topic of Flint came up for a few of the participants when discussing water security related to inequalities.

One resident, Jessica, reflected on the idea that she had not entirely considered water inequality before. She recognized that she had thought of inequalities in other resources, such as heating but had not focused on those in water. Moreover, on the subject of inequalities she also discussed the significance of lead in relation to what kinds of significant health issues that it can cause. She went on to discuss that the water inequality and issues of this sort in Boston were not as much a crisis as in Flint. Another resident, Jean, reflected how there is a potential abundance of inequality and marginalized people and could be considered particularly compared with places like Flint which already are facing these issues. In both of these cases, Flint is pointed to as a place in which the situation is notably worse and more problematic. However, in this there is also the indication of a connection to the space and insecurity that exists within Flint. It is a marker of an actual physical space where severe water insecurity exists, and this case, as it relates to inequality, has reached a severe point.

Other residents drew upon the reality of the situation in Flint as they explained their understanding and its influence on the perception of their own water. Resident Jane characterized some of her interactions with family in Cuba. When she spoke to them, they have cautioned her about water in the United States because of issues like that in Flint. Therefore, because of the situation in Flint, her family perceives her drinking water as a threat despite her own indication that she feels safe with her own water. With this situation, we see both the inter-state and international connection for her relation with the Boston water, wherein familial input defines another connection and point of comparison where that situation exists yet she indicates her own personal perception of the separation.

Resident Sue noted how Flint "makes you think about the lead soldering in pipes" and the water coming from the Wachusett and the Quabbin reservoirs and the uncertainty of the condition of the pipes. Pipe soldering, or the connective material joining pipes, can contain lead, so this reflection considers the possibility there is lead in this part of the pipe and the pipes might be in poor condition (MWRA 2017). With this commentary, Sue directly reflected how the conditions in another part of the U.S., Flint, make her think about and question the safety of the water in Boston.

At a different path in the intersection, resident Rebecca noted a more emotional response. As discussed before, she reflected on how learning about issues including Flint is "dishearten[ing]". In this discussion, she found Flint as a relevant point of reference in her understanding and reflection on water systems. Here she also is acknowledging how Flint has affected her personally with this emotional response. Therefore, this connection with another location of severe insecurity is directly influencing her relationship and feelings about her water and water systems.

Boston resident Sam brought in a discussion regarding the role of activism and water. He commented on how he believed that certain events can have an influence. He then went onto discuss how he sees people posting about Flint and how people do not feel safe. In this way, he touches upon another feature with such a high profile case, the acknowledgement of how something that occurs has the ability to influence others. This is particularly interesting in the context of his discussion of activism in that there is the idea of justice and change that could occur embedded in this idea as well. Therefore, overall, we see in the discussion of Flint, the interviewees were able to relate to another part of the United States while exploring their own understanding of the systems they interact with directly. How Flint has affected their thoughts and consideration of their own system is inherently linked with the connection over space of the accelerated time-space compression and the understanding of system and creates both knowledge and pressure.

6.2.2 High Profile Cases: Standing Rock and California Droughts

In the comparison to other Unites States locations, the actualized potential of possible water insecurity was displayed in relation to other high profile cases. As discussed earlier, across the United States there have been a number of high-profile cases of water pollution and insecurity. In addition to the case in Flint, the case of the Standing Rocking and the Dakota Access Pipeline and the droughts in California also prove to be notable. In that interviewees are making these comparisons, shows a degree of interconnectivity and pertinence of these cases to the understanding of water for Boston area residents, and consequently they feed into the sense of insecurity as a result.

Standing Rock is one of the well-known cases, which emerged as a topic of discussion by the participants. It is a case that is both political and publicized. The water of Standing Rock reservation and the Dakota Access Pipeline is further complicated with histories and present realities of injustices and inequalities faced by the indigenous people of the United States. The potential of injustice linked to a group facing this situation adds to the significance and as such present a case of water insecurity. The water insecurity of Standing Rock consists of the potential for damage to the community's water resources due to a new oil pipelines through their reservation (Hersher 2017, Brady 2016). Sam, in particular, brought up the case of Standing Rock and explicitly commented on how it made him think and reflect upon the issues of water commodification and water rights.

Another high profile case is California with droughts and wildfires. Discussion of concerns regarding California and the droughts therein, gained from news and other resources reflect this other role of high profile temporal and spatial meeting of pressures. In contrast to Standing Rock, where it is insecurity due to potential contamination, or Flint where there is actual contamination, the case of California is a type of insecurity based on an actual scarcity of water. This situation emerged in the discussion by interviewees. Jessica specifically addressed this issue and concern for agricultural practices in California with regard to water. Rebecca's own personal life experiences with California are explored from the personal perspective.

6.2.3 Personal Travel and National Experiences

Beyond the discussion of high profile cases, some of the participants gave good examples of how personal movements between states impacted their own understanding of the water system. Not only are they part of the larger system in which there are connections through general movement around the nation, but they themselves move between states, thereby learning about water by encountering new water systems. Travelling between systems or within larger systems impacts people's own experience and role within their world (Massey 1994, 147-156). In their reflections, interviewees exhibited a complex understanding of the Boston water system based on their own personal life experiences with other water systems and understanding of the water security. As residents explained their experiences living in other states and the water systems therein, they added, through a process of

comparisons, a nuanced understanding of what the Boston water system means to them.

Despite being a long-time resident of Boston, Sidney described experiences from a different state, and a different type of water or infrastructural system or scale. She reflected on water use practices as she critiqued how she had seen some of her younger co-workers wasting water as they let it run. She attempted to explain this difference of practice attributing it possibly to a generational differences but she also connected it to her upbringing and encounters with water. Sidney established how she had grown up in rural Connecticut and had used well water there. She also acknowledged that she had had a good well but others did not. In recalling this initial encounter with rural water in the state of Connecticut, she illustrates how her movement between systems has influenced her understanding of water and the possibility of stressors and water insecurity, thus establishing another intersection of the compression for Boston's water. She has moved between states and also from a rural area to an urban area. In this move, she further moved between types of water systems from a well water system to a large-scale urban reservoir system that is used in Boston with the MWRA.

Jane also compared water from her place of upbringing to describe Boston water. She had grown up in Miami, Florida, she described Boston water as "pretty good" and that she was "comparatively pleased." She further explained that her water had been good in Miami, indicating one base-line for her understanding of Boston water as someone entering the Boston water system. She explained a change to the water system her family had encountered in the water system in Miami. There recently had been an issue over the last year so that her family members in Miami have been drinking bottled water because they do not trust using just a filter. In her explanation of her move from Miami to Boston, she gives a two-fold understanding of the Boston water system. First, she had experienced a system, which had a degree of security to which she compares Boston's water. Nevertheless, the security of the water's quality proves faulty and despite now living in Boston, she has the continued connection to this other water system and the stressors therein through her family. She experiences overheating as a composite of her different experiences.

Rebecca recounted water stories of a distinctly different understanding of water security based on her experience in California. She had moved to Massachusetts several years earlier after having grown up in California. Like some of the others who had stories of moving, she too still has a link to California with family that lives there. Her movement illustrates the experience of the time-space compression where California and Massachusetts are thereby linked. She compared this life in California and the water there with her experience with water in Boston and Massachusetts. California has faced significant droughts in recent years, and this state of drought is a point on which Rebecca focused. Discussing the "droughts back home," she reflected on some of the water use practices that she saw and experienced. They would let the lawn die in the summer, but in winter, there were green lawns and they always had a garden. Moreover, she elaborated how although they had a pool with this they saved on electricity as they used the air-conditioning less. In connecting the story of her water use and the air-conditioning, she establishes an environmental perspective, which influenced her practices.

Other stories of moments and specific encounters seemed to be significant in Rebecca's understanding of the use in relation to water security back in California. She reflected on encounters with Disneyland and even though there was "drought in a lot in Southern California [they had] a water show every night." Rebecca described these water shows as having a lot of water wasted and as a moral issue as well. With this reflection, she exemplifies the problem of water shortage as she saw it in California and her personal response to this. She also described another encounter she experienced in college when they had to cancel fireworks because it was too dry. Again, she illustrates with a personal encounter and water story, how the California droughts impacted her life.

Rebecca also demonstrated how the water insecurity she faced affected both actions and ongoing choices. With the uncertainty of water in California also comes the threat of fire. She described specifically how preparedness "was a part of life" explaining how her grandparents had an evacuation plan and the important documents in one place in case of fires. This experience with the threat of water insecurity in a different climate from Boston remains a reality for her and her life experience. She characterized how awareness increased although the known

problems were not fixed. She contrasted some of the practices that she has seen in Massachusetts, to those done in California. Specifically, she noted that while she recognized that there is not the same level of water shortage as in California, she still sees people watering lawns in the middle of the day as "pointless." She further elaborated on how she acts due to her personal experience with water insecurity and how after having moved to Boston, she still performs tasks utilizing a minimal amount of water. This had led to an awareness of her use and results in her behaviors such as not leaving the water running while doing dishes. She moved from California to Massachusetts, with this mobility she carries with her these particular water perspectives and understandings of degrees of severe water shortages and insecurity and thereby despite adequate supplies in Boston, retains the sense of an overheated system of a compressed world.

Another instance of a type of mobility that offers an understanding of time-space compression emerged during two particular interviews. These two Boston residents compared their experience with Boston water to the experience while living in Washington, DC. DC is the capital city of the United States and a major East coast city. There are many organizations, government agencies, and universities in DC, so it is another city characterized by high mobility. For instance in 2017 alone, approximately 1,419 people moved from DC to Massachusetts and approximately 1,974 people moved from Massachusetts to DC (U.S. Census Bureau 2017b). Likewise, DC is a place of mobility, as in that same year over 56,000 people moved into the city (U.S. Census Bureau 2017b). Therefore, one can see that DC is a place with connection to Massachusetts as both are mobility hubs. Both Jessica and Alice compared the water from their time living in DC to that of Boston. In this comparison, they negatively critiqued the DC water and spoke positively of the Boston water. Alice explained how she thought the water had caused problems with her skin while living in DC. She had not had the same issue in Boston and therefore, thought it indicated something about the water in Boston and that it was of better quality. Jessica compared how in Boston she drinks out of the tap directly but in DC, she did not. She elaborated further that in DC she would get notifications in the mail about the high level of bacteria counts. Generally, she described the water there as bad but now being back in Boston, she drinks water from the tap again. Once again, with the movement of these two individuals enables them to compare the water in

Boston to a water system they saw as not as good in the United States. Their mobility has given them direct understanding of the pressures of insecurities of another water system has given them a direct albeit different understanding of the water system in Boston.

Ellen, another long-time resident of Boston displayed an understanding of her water based upon her experience in another state as well. Although, living in Boston, she also has a camper where she spends time in upstate New York, a more rural area west of Massachusetts. During the summers, she goes to the camper with her dog. At the camper, she has well water, and she compared the quality of this water to that of her Boston water. This direct encounter with another water system seemed to inform her understanding and explanation of the Boston water. With the well water at the camper, she experienced a different form of water security. She described how the water at the camper when she first moved smelled bad, even with a filter. She noted, in contrast, Boston water does not smell and Boston's tastes better. She went on to discuss how she greatly liked the Boston water but she had to drink bottled water at the camper. She explained that even her dog would drink bottled water at the camper. She did, however, use the camper well water for cleaning dishes. She explained how the way with which she dealt with the undrinkable well water at her camper was that there were spigots in the town, and she would collect water from there. This water was free but one spigot was with the local mineral water, the taste of which she described like sulfur or rotten eggs. Overall, she displayed an awareness of the kinds of issues that could exist in other locations while also acknowledging therefore, what can be positive about her own water in Boston. She explained: "I've lived here long enough, take water for granted, people don't appreciate it look at drought places vs northeast." With her mobility to another state, she gains a broadened sense of the types of water insecurity which she could directly face and is a reality for some of her life. Therefore, those insecurities, which are not realities in her life in Boston, also can take on a place of comparison. Others too expressed this idea that in other parts of the United States you might not have the same access to the quality of water that they expect in Boston.

Therefore, Massachusetts and Boston in particular are mobility hubs for the United States. Through the comparisons on the national scale they reflect the potential

stressors. The water security across the US is not consistent and thus, the experience of insecurity becomes tangible to the Boston-based community from the various national locations.

6.3 Comparison to the Global

The stories expand further beyond Boston as several of the Boston residents framed their understanding of the Boston water system based on interactions with international water systems. With such a broad type of comparison there is even more room for vastly different types of water stressors. This framing reflects a degree of mobility and how these international stressors form the understanding of water security in Boston. As discussed, Boston is an international hub of mobility. Again, the mobility of people is dependent on different factors and can reflect various placements with regard to power in the systems they move through (Massey 1994, 147-156).

6.3.1 Ireland

One longtime Boston resident, Brigid, spoke of her experience with Boston water and her perspective over time and space. In her description and explanation of the Boston water system, she frequently grounded this understanding in a comparison to her experiences with Ireland. Early on, she established that some of her family is from Ireland, including her father, and additionally, she has spent a good deal of time there. She continues to travel to and spend time in Ireland. When describing her water in Boston, she explained, "the water is great! You can definitely taste the difference." With this and throughout the interview she spoke positively about the benefit and emphasized what she saw as a privilege of Boston water, having it in her home and it being clean. This positivity was also coupled with a nuanced reflection on Irish water systems and how water systems may not meet standards or ease which she would prefer.

She initially reflected on her first experiences with water in Ireland in the mid-1970s and followed her understanding through to the present day. She painted her first visit as an image of lacking. Traveling from Boston to Ireland, she encountered a new kind of status of water security. She recollected how her family in Ireland did not

have running water or a fridge but did have a radio in their 400 year old family house. The question also emerged regarding how she did not know where the water came from. She explained that they knew they had some water sources because they made tea and spoke of bushes but remained uncertain about the water source. This personal experience with water security appeared to be in contrast to her life experiences in her home in Boston.

Similarly, she noted how her father from Ireland was appreciative that in their Boston home they could have water from the tap and even hot water. Again, her personal family connection to another location grounds the sense of insecurity that can exist in the present (as a reality). She went on to explain the changes to the family home in Ireland with major modernizations, including those concerning water. Therefore, as Brigid reflected on the development and lacking in her family's Irish home she was able to make a comparison to her Boston home's consistent water source and highlighted a point of water safety in Boston. Moreover, in her understanding she is able to add complexity to her perception of her own water system and what types of stressors and overheating that can exist. Her experience is indeed a compression of the changes over space and time as her "social relations" span continents and systems (Massey 1994, 147).

The understanding of this Irish water in comparison to Boston water was also fixed in objects. In her discussion, smaller points of comparison emerged with comparison about smaller inconveniences. She explained water at her place in Ireland leaves an orange rim on the dishes with iron and manganese. Whereas in Boston she praised how the water does not cause problems with the dishes or leave lime scale in the kettle. In this case, we see a concrete comparison wherein her understanding of another international water system due to her own mobility fosters an appreciation of the Boston system. Here she has reflected upon what the quality of water entails in the comparison. Indeed, there is a feeling of the connection to and the actualized presence of stressors with this international comparison.

Interestingly, she also noted tourism, a component of overheating, as stressor on the infrastructural systems of water in parts of Ireland (Eriksen 2016, 60-70) With this instance she also is drawing upon a stressor she knows from Ireland in order to explain and conceptualize water systems. As such, it parallels in part the Eriksen's

theory of overheating. With her mobility and link with Ireland, the reality of having insecure water is distinctly in her understanding. Through this mobility and experience with Irish water, her understanding and experience of her own water in Boston appears to be informed.

6.3.2 China

For one resident, Leah, mobility also appears to be a significant impact on her understanding of Boston water. Leah grew up in the Boston area and presently lives in the Allston neighborhood of Boston; however, she also drew upon her experience of living in China to explain her experience with Boston's water. Although being from the area, Leah spent some time living in China as well as time in other states including New York and California. Her time in China played an important role in influencing her understanding of her own water. Initially when she first began to discuss her thoughts on the water system, she discussed how she was a "tap water believer" and overall how she trusted the water system of which she is a part, thereby indicating a current positive feeling with the Boston water. In contrast, she explained how her boyfriend, with whom she lives now, was from China and how she also had lived there. In this explanation, she highlighted how, the tap water in the area of China where she lived was not potable. She further explained, how when she came back, she was happy with being able to drink tap water again. In this reflection, she exhibits how through her movement between water systems, she gains a insights about water security possibilities and the potential of insecurity. She exhibits how mobility has given her an additional layer of perspective and understanding of how she is using the water and the benefit of the system. In this, she also has an understanding of an additional type of water insecurity that can be present for a consumer. This level of understanding spans international borders as she gains the understanding from China.

Leah also considered how the experience affected her personal choices and use of water. She explained how she has tried to take shorter showers and take part in other similar practices of water conservation. She further commented on how water is taken for granted. So therefore, this international mobility not only affects the ideas of understanding of water insecurity but also the on-going choices and ways in which interaction with the resource of water occur.

6.3.3 Cuba

One resident, Jane, provided two unique points of international connection to explain her understandings of Boston water and ideas of security. Jane has lived in the Boston area since she came to Massachusetts to attend college. She had grown up in Miami, Florida, which served as reference point for some of her discussion. However, her family came from Cuba, and she has family that still lives there. She reflected both on her time and family experiences in Cuba and also knowledge about Bolivia based on the aforementioned volunteer work she did while still in the United States. With these connections, she reflects how the mobility and interconnectedness increase the nuanced and grounded sense of insecurity in water as a potential reality. Both reflect the effects of increased mobility.

A primary instance for Jane in her reflection upon the link between mobility and understanding of water insecurity was an explanation relating to her family and her own life. In her interview, she explained how her family had come from Cuba. Likewise, she has spent time visiting this family. In her explanation of water in Boston and water systems, she related it back to her encounters with her family from Cuba. First, she discussed the difference how when they are visiting in Cuba, they have to boil water. Recently, they have just begun to buy bottled water for the time that they visit. This seemed to be in contrast to the Boston water, which she said she drank without a filter. Here we see a difference of specific water practices that are concretely compared based on personal experience in another country.

She also relayed stories from her family in Cuba that she has been surrounded with in her life. She explained how her grandfather had built the water system for their family house. She recounted another story from her father wherein in his city there was a shared water pipe for water provision. It was here, that someone had been assaulted when taking too long to get water from the shared pipe. Once again, with this story of violence and stories of water quality, there is a distinct sense of contrast in the kinds of difficulty that can occur in accessing water from that in the existing urban Boston system. Nevertheless, this relationship with the uncertainty emerges from a direct connection to the insecurity. The insecurity is a lived reality for her family members so this informs an understanding of what real-life insecurities could be. The family link in the story, like for Brigid, concretely illustrates a case of time-

space compression wherein the "stretching-out of social relations" is evident (Massey 1994, 147). In spite of present Boston water, with her mobility between the water systems, the difference in water security for her based-on Cuban water is a lived-reality and informs her explanation of the Boston water system. In this sense, as she partakes in the globalized world, she experiences the pressures of the overheating directly.

6.3.4 Other international mobility considerations

When considering the international movement, mobility, and the spatial dynamic of the pressure, there are other considerations to examine with such movement. A point that was brought up by some of the water professionals was that some of the water use practices people have done in other places in the world might be brought and continued to where they have moved. Therefore, just as understandings of the types of insecurities of water are able to move with people, so too are the practices associated with the use of water. Based on infrastructure, environment, and other factors water use is different in different parts of the world. Some of these types of practices mentioned include drinking from bottled water or fishing in waterways. These types of practices might differ from other common practices in the region, where previous practices and perhaps policies would not expect these types of water use patterns. With the differences in use, there also could be different considerations like safety of waterways if they are being used for fishing when they had not been before or the additional costs of water that might not be broadly taken into account. These variances in safety and costs of living are indeed other factors associated with mobility and the continuation of practices. Further implications of these will be discussed later in relation to specific stressors and inequalities.

Overall, mobility plays a significant role in the understanding of possible water insecurities. People encounter the time-space compression as they move between, engage, or feel connections with other locations. Moving between these locations there are different systems and feelings of insecurity. This interaction with other systems informs the perceptions of the Boston water system. Therefore, comparison is of importance and as it indicates a sense of privilege.

It is evident that through the water stories people reflected on this distinct geographic connection and mobility with a far reaching experience of water. In so doing, comparison became the tool wherein they could better understand and define their present Boston water and feelings towards insecurity. The next chapter will explore how these stories are nested in relation to inequality and power.

7   Stories Across Relations and Power

This chapter will develop the way in which stories move across relations and power. These often relate to trust and inequalities and ultimately bring together the ideas of engagement, temporal pressure, and spatial pressures. Trust is not a completely simple idea as it depends on the interactions of many parties and inherently relate to issues of inequalities and inequities. The stories in this chapter first provide evidence of how people's trust in the system fails. Then it explores the ways in which trust building, another component identified by Eriksen for dealing with the overheating world, can be developed to deal with the intersection of insecurity and inequalities (Eriksen and Schober 2017b).

In the interviews, there was emerging discussion of the injustices that people recognized as an outcome of their personal and broader water systems. Perspectives on injustices, inequality, and inequities in the water system varied for the interviewees. For some, this was not a topic that they had particularly considered before the interview and often they did not have many specific reflections. For others, this was an issue that was especially meaningful to them.

7.1   Theories Relating to Trust and Inequalities

During the last decades, there has been an increased focus on the human right to water globally and also in the United States. Water (and therefore the lack of access and quality) is framed as a human rights issue. "Tapped Out" uses this framing of human rights in its discussion (Georgetown Law Human Rights et al. 2013). Water as a human right is also explored in the primer or guide produced by the Northeastern University Law School (Murray and Kominers 2014). This is recognized at policy levels and in collective concerns for human rights themselves. However lately, it has also been discussed in contrast and as in conflict with ownership of water, rights to ownership come into conflict with water as a public good or as a human right (Barlow and Clarke 2002). There is a fair amount of information regarding specific cases in the United States. "Tapped Out" and "The Human Right to Water in the United States" both discuss the cases of water shutoffs in several cities in the United

States including Boston and Detroit (Georgetown Law Human Rights et al. 2013, International Human Rights Clinic at Santa Clara University School of Law et al. 2015). Issues regarding human rights and water in the United States have specifically come to the attention of the UN Special Rapporteurs of the OHCHR. They went to Detroit to evaluate the situation with the shutoffs (UN OHCHR 2014b, 2015, 2014a). In the discussion of human rights and social justice as these relate to water, theories of environmental justice and inequality become significant.

Water security can also be assessed in how it relates to the people who are affected by it and as a social issue. Theories of environmental justice inform an understanding of the situation in Boston. The idea of environmental justice identifies how people face uneven risks because of environmental problems. This uneven risk falls on some communities with greater frequency than others and the communities with the most risk tend to be composed of low-income and/or minority individuals. This broad theoretical field has a large existing set of literature. There are many ways to define environmental justice and as it is a concept that relates to people and their lives; consequently, it moves across disciplines (London 2018).

In Rhodes' work, *Environmental Justice in America: A New Paradigm*, the idea of structural change and policy stages are also brought into ideas of environmental justice (Rhodes 2003, 48). Moreover, in *Garbage Wars: The Struggle for Environmental Justice in Chicago,* David Pellow brings forward a definition as (defines a problem of) "low-income and persons of color are carrying a heavier toxic load" (Pellow 2002, 162). There are many other sources that consider issues of environmental justice including *Access to Environmental Justice : A Comparative Study* (Harding 2007) and *Urbanization and Sustainability : Linking Urban Ecology, Environmental Justice and Global Environmental Change* (Boone 2013). The first, looks at various environmental justice cases occurring in places around the world, presenting them with consideration of processes and policy structures (Harding 2007). One chapter specifically examines the particularity of environmental justice, the movement, and its role in the United States (Cha 2007). In this, environmental justice is presented as how people due to class and race are risk and excluded from "decision-making processes" (Cha 2007, 318). This further elaborates how clean and safe environmental conditions are a right (Cha 2007, 320); however, in this context

environmental justice is not strictly a legal processes, like courts, but encompasses broader ideas (Cha 2007, 319). This text defines how the environmental justice movement found a somewhat distinct place from the general environmental movement (Cha 2007, 321). The movement in the US can also be tracked in terms of the legal and policy progress with advances in protections of water and Executive Order 12989 of 1994, specifically addressing environmental justice (Cha 2007, 323-348). The latter text *Urban Ecology, Environmental Justice and Global Environmental Change* brings in different perspectives on the systems of regarding environmental justice while also framing the urban environments and ecology in this context as well, which is particularly relevant to the Boston case (Boone 2013).

Theories of environmental justice bring in different aspects of water security and also some additional perspectives as it has policy implications for a larger movement (Agyeman 2005). With these also come theories of community based participation and involvement by the communities at risk (Agyeman 2005, 23). Looking into the Boston case and within the context of the United States, this theory of unequal hazard and environmental risk is important to consider as specific populations can experience issues differently and it can add to uncertainty.

Another related theory to consider and incorporate is that of slow violence, wherein hazards that occur over time and incrementally may not be as visible (Nixon 2011). Slow violence could be something to consider with relation to environmental justice in this case because the hazards posed by compromised water in these communities may not have an immediate effect but rather occur over time. While the story of the MWRA and the cleanup of Boston Harbor is framed as a success, it was the slow violence of the gradual degradation of the harbor in the first place that necessitated the cleanup. Attention to treatment and disposal of waste is a growing concern globally and acknowledgment of the degree of effort and costs involved in bringing Boston Harbor to its current condition need to be recognized. By ignoring this question of violence and the risk from the environmental problems, it is likely there will be issues such as the slow manifestation of health problems from prolonged exposure to pollutants. The extra struggle and burden of not easily accessing water could also add to this violence. All of which could be anticipated given knowledge of the struggle experienced by Boston to clean up its harbor.

Theories of race and prejudice are other social issues that are also significant consideration and that relate to the aforementioned environmental justice theory. Questions of race and socio-economic status are relevant in the research in the Boston area, as there are differences between communities. Therefore, considering implications of the policy and the actual results Pellow also develops a more specific theory of environmental racism that can also be considered (Pellow 2002, 2). Camacho et al. can provide further insights into theories on race and the environment (Camacho 1998). These concerns largely relate to ideas of rights and safety of people.

All of these works provide an additional lens with which to understand the water stories and water insecurity in Boston. It is to water stories related to questions of justice rights and environmental inequality that I now turn.

7.2 Injustices and Systemic Inequalities as a Concern

There is lack of trust but there are larger inequalities and problems of environmental justice. The water contamination in Flint Michigan, which is a low income and largely non-white community, triggers a discussion about the larger inequalities or inequities related to water justice. Flint, as portrayed in the media and also by several interviewees, is an example of a particular place, which raises concerns related to environmental justice. Some of the people interviewed reflected the concerns for environmental justice and suggested the lack of trust as important. Of the residents, some people considered how they thought of the possibilities for inequalities. In these cases, people detailed their concern for how inequalities emerged in the water systems. Jane reflected on how water inequality was indeed "something [she] had experience with" because of her work in her undergrad with water in Bolivia. She grounded this understanding with a specific example of a basic necessity like bathrooms: "to people you so easily go to the bathroom, buy think a lot of places don't have access." With such a concrete example she illustrates how her specific concern for water inequalities has developed. Likewise, Jean described an "abundance of water marginalized inequality resource access." Nevertheless, others stated that inequality in water availability was not something they had particularly

considered. For instance when asked if she had perspectives on water inequalities, Alice explained, "I can't say I really every have." Of the professionals, there was a general concern of providing services to the various population. The non-governmental professionals and activists often identified issues that most squarely could be identified as environmental concerns. Thus, there was not a uniform understanding of this concept and it shows a complexity and perhaps a reflection on interactions of the various participants with the systems.

For some, the inequalities were framed as troubling and concerning. For the water professionals the language of environmental justice was particularly relevant. Some of the individuals from specific non-profits groups highlighted the significance others found in addressing the environmental justice issues. For instance, the Clean Water Action's does targeted work in this field. Similarly, Laura working with a river organization Massachusetts further exemplified this and also the shift in these practices. Those with government experience and knowledge also highlighted the work and significance of the concerns for environmental justice and how this was something they considered a priority.

7.3 Lack of Trust in the World and Future Safety

Several of the interviewees nevertheless referred to a lack of trust in the system. This lack of trust specifically manifests itself in an experience of insecurity related to the environment and the world and where it is at present heading.

7.3.1 Lack of Trust in the Political Systems

As discussed in the introduction of this thesis, while over the course of this thesis and research period, there were political and environmental political occurrences in the United States. There are large concerns regarding a particularly criticized and polarizing government. Likewise, there have been major incidents and hate groups on the rise (Janik 2018, Duggan and Jouvenal 2019). Similarly, there have been major changes in environmental protections, which have also prompted concern (Turkewitz 2017, McGreevy 2018, Greshko et al. 2019, Popovich, Albeck-Ripka, and Pierre-Louis 2017, Tabuchi 2017). Such larger concerns relate to systems of

power and politics. Therefore, such large-scale considerations could be seen in the expressed concerns for inequalities, as some of these inequalities, such as race or poverty are factors in cases as in Flint or Standing Rock, and can link with larger systems and problems.

Such a political situation therefore, has an important influence on the broader situation. The present political landscape also had an influence on the expressed perspectives and understandings of the respondents. Several interviewees touched upon the current political climate as particularly concerning. Jessica, for instance, specifically brought up her concerns about the administration and policies that were being developed and implemented. Likewise, Sam brought up the political system and feeling of being somewhat "jaded with electoral politics." The concerns for the political and governmental situation reflect how there is a lack of trust and certainty in the system. This type of insecurity is a pressing issue and adds uncertainty for future prospects of improved water security.

7.3.2 Infrastructural Insecurity

A part of the issue of concern that deteriorates trust is the lack of trust in and security of the infrastructure. From large pot holes to highly publicized bridge collapses, people experience the infrastructural concerns in different ways (Mazzei, Madigan, and Hartocollis 2018). Some of the consumers expressed concerns and lack of trust could be related to general infrastructural concerns. The discussion of the Flint and other infrastructural functioning issues again reflect this larger concern, which informs understanding but also reflects a lack of trust. Others specifically discussed their concerns with the larger infrastructures. This pressure from lack of trust in infrastructure could also be considered with concerns for the types of ways this could relate to systemic injustices. The infrastructural uncertainties can also be viewed as the build-up that results in a compression over time.

In his reflection, Sam addressed the recurring infrastructural issue of pipes being old, highlighting this as a major issue. He elaborated, however, that a solution to this problem is "grander scale investing in infrastructure." Jessica also discussed her concern for the infrastructural systems. She explained how she saw one of the

biggest issues was "the crumbling infrastructure that is being taken care of in the US."

In her discussion of infrastructural concerns, Jessica also brought up a big event at the time of the research in a nearby community. On September 13, 2018, while I was in Boston, there was a major gas explosion affecting several towns north of the city: Lawrence, Andover, and North Andover (Reuters 2018, Sanchez and Chavez 2018). In many homes in Massachusetts natural gas is a utility that is used to heat homes, heat water, and for cooking appliances. With this gas leak, there were estimates of reports of as many as 70 explosions and fires in homes (Romo and Domonoske 2018). With this, there were many injuries, one death, and as many as 8,000 people had to leave their homes and were without power and gas (Reuters 2018, Romo and Domonoske 2018, Stelloh and Winter 2018). People continued to face displacement and lack of gas for several months going forward, even with the oncoming winter (Creamer and Walters 2018, Pfeiffer and Rivera 2018). So while this is not about water, it is an essential infrastructure-dependent household utility that increases the experience of insecurity. Similarly, one community in particular, Lawrence, is largely a low income and immigrant community, a point which both the news media and the mayor of the city pointed to as limiting factors that could cause extra difficulties for the people to handle the situation or making them more vulnerable (Pfeiffer and Rivera 2018). Such an idea of vulnerability and a more at risk community is a good instance of wherein questions of inequalities and justice emerge.

As Jessica specifically brought up this event north of the city, she was touching upon a grounded concern for infrastructure and the concern for the communities. In the moment of the interview, this was a pressing issue in the Boston area. Once again, the infrastructural concerns directly relate to inequalities as people might experience the difficulties in different ways. Her reflection on this case also reflects upon the feeling of lack of trust and security in the infrastructural system at large.

7.3.3 Environmental Hazards & Climate Change

People's reflections about water security also related to further concerns about environmental hazards. These threats of various forms of environmental hazards and

climate change were significant determining factors for the undermining of trust in the water systems. This section considers the way in which interviewees expressed a general type of concern with larger environmental risks.

Pollution or contamination was one key point wherein water trust was undermined. This point is one with which the some of the government individuals and professionals were specifically concerned. Water and therefore its contamination does not remain isolated as systems flow and interconnect. Pollution and contamination of waterways are particularly relevant as they relate to larger water systems and therefore, water management and drinking water safety. For instance, Christina brought up the evolving nature of the protections from pollutions and regulations that address this. She explained, as aforementioned, how the focus and understanding of water protection has evolved for instance, regarding specific previously unmonitored environmental hazards. This discussion illustrates how both there are a number of environmental concerns and how even previously unknown hazards can start to become pertinent and relevant for being addressed.

Similarly, water professional Clara also addressed the issue wherein pollution from industry and the commercial sector can pose a threat to water systems both from the ecological perspective and the human health and safety perspective. She explained how as this was an issue, government agencies play a role in regulation. Water professional Laura further elaborated on concerns for the protection of water systems and the interplay of potential dangers to the water system safety. In this way, these water professionals clearly highlight a sense of the types of threats to water system safety and quality that are frequent issues. These discussions illustrate a role of the water professionals in dealing with this water pollution and deterioration. Despite the strides made by the MWRA throughout the 1980's and the 1990's as new issues are identified they continue to need to be addressed. These instances tell the story of the way in which there is an active work to deal with the pollution, which can be a part of the system.

As the residents were discussing their concerns, they, like the professionals, brought in perspectives on water pollution issues. Fracking and fossil fuel extraction were identified as points of concern. This kind of extraction, indeed, is yet another cause of potential contamination of water quality within systems. Both Jessica and Sam

reflected on the ways in which this fossil fuel extraction continues to pose water threats in various parts of the country or world. Similarly, Sally reflected on issues with waste and streams. With these reflections, the residents demonstrate an awareness of environmental issues relating to contamination of water resources. With the threat of the contamination, there is clear sense of pressure on the water system and thus a continuing deterioration of the trust in the system.

The Environmental Future and Climate Change

Linked with the lack of trust because of environmental hazards is the forward-looking and future-oriented perspective towards the environmental concerns. This future-oriented perspective recognizes the potential for insecurity. Another concern that was noted was water scarcity and drought was another issue that people brought up. As such, they commented on practices to conserve water such brushing their teeth in the shower or being conscience to turn off the water.

Nevertheless, connected with many of the environmental concerns was also the question of climate change. This was an issue that many of the participants mentioned, and they often linked it with the other environmental issues such as scarcity and drought.

Some residents expressed sincere concern with the prospect of climate change. Sally, for instance, was specifically "worried" with the effects of climate change. Jessica and others, similarly, reflected on the implications on the future of water resources with climate change. Considering the environmental future Sue questioned "What are we doing and when will we understand and how better use the system and not rob the environment?" She further expanded upon this sentiment with the statement "We think we are so healthy but we are on death row." Such a grim prognosis for the environment illustrates an understanding, perception, and relationship that some of the people have toward their environment. She provided some possibility for the environment when she "hope[d] we can figure it out."

Most of the professionals with both government and non-government affiliation also highlighted the concern for climate change as a serious issue. They discussed the threats from issues like droughts and the need for building climate change resilience. A component of this is the implications of higher levels of stormwater and the

resultant flooding. The Boston area is a coastal community and therefore this threat is particularly pertinent. With the threats like more severe storms and flooding, there is also the consideration of environmental justice where to what extent are people able to deal with the threats. As such, the City of Boston has been developing a climate resiliency, which reflects concern for these issues (City of Boston 2018a, 2019a, 2018b). They have focused on specific areas and have a range of specific resources on this area (City of Boston 2018a, 2019a, 2018b).

The discussion of stormwater, flooding and climate change is also particularly relevant as the pricing of water is also based on stormwater as well. The BWSC deals with stormwater as does the MWRA (Laskey and MWRA 2014, MWRA 2019b). There is combined sewer, a feature in some older cities, which handles both waste water and stormwater (MWRA 2019b, BWSC, Schofield, and Sullivan 2019, BWSC 2019e, f, g). A part of this system then is Combined Sewer Overflows, where when the sewers "reach capacity" and untreated then is released in to waterways (MWRA 2019b, BWSC 2019d). With increased severity of storms due to climate change, increased pressure will be put upon the existing systems and releases of water that has not been as thoroughly treated can occur. In the interviewee with the professional from the BWSC this was a concern raised and climate resiliency is also discussed in their media (BWSC 2019c). An awareness for this stormwater system was also commented upon by residents such as Brigid. She commented on the visual signal of the fish signs on the sewer drain (See Appendix F, Image 5.) She further reflected on how important she thinks it is that people understand that with bad storms there is overflow. For Brigid, the threat of storms and the resulting overflow are realities further reinforced by what she sees each day in the signs. We see the direct threat from impacts of climate change as large points of concern in people's lives but also directly on their water use.

Plastic

Plastic was a big concern that people brought up several times. The presence of microplastics was specifically addressed by some where we can see an incidence of the direct impact of water resources. Interviewees repeatedly discussed the use of plastic water bottles and the concerns therein. Clearly, these concerns are not exclusively linked with their own Boston water system but instead reflect a broader

lack of trust in the overall system and future of the water ways. It also is significant in that although it is not specifically linked with the infrastructural water of Boston, it is linked with people's water use in Boston, as people do use the plastic bottles as their drinking water source such as Aria who discussed how that was what she drank.

7.4 Pricing, Commodification, and Insecurity of Shutoffs

A core question linked with trust and inequalities is that of pricing and costs involved in water. There are consumer costs related to the water and systems of water payment. In the process of provision of water, there are many costs that are embedded within the pricing structure such as the cost of incoming water, outgoing water, water treatment, stormwater, and other infrastructure maintenance. These are also important because as a resource there are different ways of dealing with payment for the costs. Similarly, there is the potential for inequalities when a necessary resource, like water might be so expensive that some people cannot afford it. This section looks to understand the way in which pricing and commodification of water changes the relationship and understanding of water and ultimately can be grounded in inequalities.

7.4.1 Commodification Background

An important avenue to pursue is the discussion surrounding the commodification of water and how this contributes to a questioning of security. Different sources sometimes frame the discourse on water commodification in economic terms. The economic basis occurs as an underlying principle and field of thought from which some sources move. For instance, in *Macrodynamics of Globalisation, Uneven Urban Development and the Commodification of Water,* Patrick Bond enters into the discussion by critiquing the larger globalized capitalist and macroeconomic systems and liberalization, which ultimately connect to the commodification of water (Bond 2008). Bakker also explores the economic ideas with commodification of water, as she evaluates how in England and Wales there was a move in the late 1900s towards privatization of water. This article evaluates ideas of water privatization and as parts of markets. This also incorporates technical aspects of the water infrastructure, a

discussion of neo liberal structures, and how water markets fit into economic systems with a questioning of the applicability of ideas such as competition (Bakker 2005). Similarly, Castro examines the historical move towards these market systems and the role of society and rationalization in the move towards commodification (Castro 2013). Moreover, in their work, Barlow and Clarke critique the role of larger institutions with economic influence such as the World Bank and the IMF in pushing towards the commodification and privatization (Barlow and Clarke 2002). In this discussion with water as a commodity that specifically exists in a market, bottled water is problematized (Patsiaouras 2018, Jaffee and Newman 2012). Therefore, there is indeed an existing discourse bringing forth questions on how water is valued and viewed through an economic lens and this seems to be an underlying issue as a factor in water access. This placement of water as a commodity and in the economic system proves relevant in the perspectives explored.

In addition to the discussion of the links between markets and water, discourses specifically concerning affordability of water also have emerged. Moving towards questions of affordability also grounds some of the question of water access and commodification at the human level. In a publication by Georgetown Law Human Rights Institute: "Tapped Out: Threats to the Human Right to Water in the Urban United States," the authors discuss different cases and issues of water but the article bases some of its argument on questions of affordability of water (Georgetown Law Human Rights et al. 2013). Similarly, in 2005 a plan (which is not still fully in use) was created to ensure water affordability in Detroit, using this affordability concept as grounding principle incorporating ideas of credit and other mechanisms (Colton 2005). This push for affordability is also seen in other literature from other reports on solutions and tools (American Water Works Association, U.S. Conference of Mayors, and Water Environment Federation 2013) to the testimony by the NRDC regarding affordability (Oslon, NRDC, and Works 2016). There has been some discussion examining the actual models that are used in the financing of water, in different global contexts (Frérot 2011).

7.4.2 Threats of Shutoffs

The threat of having one's water shutoffs because of an inability to pay is a serious issue given the significance of water for people's wellbeing. This issue also can be

seen as a direct issue of justice as the inability to pay can relate to economic status. Therefore, this idea of the possibility of the water being turned off is yet another source of pressure on the overheated understandings of Boston water.

This issue of water shutoffs has gained some attention. The presence of several important reports that reflect this concern regarding the status of water being shutoff, particularly in the United States are significant in understanding this process, which will vary from one area or system to another (Georgetown Law Human Rights et al. 2013, International Human Rights Clinic at Santa Clara University School of Law et al. 2015). The Unitarian Universalist Service Committee (UUSC) similarly did a report on this issue. This report highlighted that there is a problem in that people are having their water shutoff and cannot afford water (Jones and Moulton 2016). Likewise, in this report as with that by the Georgetown Law Human Rights, there are discussions that people in Boston are facing some water insecurity.

The Color of Water Project is another valuable work that has also has studied water shutoffs. As mentioned in the discussion of mediating organizations, the report investigated into the links between the shutoffs and race. In this analysis and mapping of data from the city regarding threatened shutoffs or notifications and census information showed a link between the rates of threats and the percentage of people of color in a respective community (Massachusetts Global Action 2014). The data indicated that the wards with highest shutoffs mostly had a population of at least 64% of People of Color and three of the highest had above 81% population of people of color (Massachusetts Global Action 2014). Neighborhoods included in some of these areas include Roxbury, Dorchester, and Mattapan (Massachusetts Global Action 2014). These results are important as they indicate a specific larger question of justice as it applies to the Boston community. Threats of water shutoffs indeed, can be viewed as a serious pressure and if there are certain communities facing higher rates, this is problematic.

Similarly, in the interview with those from Massachusetts Global Action, who had conducted the research, they explained how the project had developed through involvement in other work with other concerns. Another consideration of how there may have been improvements, a lowering of frequency could also be taken into account. They framed this case indeed as human rights issue. They also elaborated

how it becomes complicated with different factors that can additionally drive up water prices. Their work also indicates concerns regarding the increasing water rates overall (Massachusetts Global Action n.d.). Indeed, this work indicates a level of concerns possible path of concern for the situation of injustice with such inequity of community and resource access.

As also mentioned before, they indicated there remains further room for additional research on newer data. Northeastern Law School, through the Program on Human Rights and Global Economy (PHRGE), recently published a guide to collecting information on water affordability, data which can be elusive (Murray and Kominers 2014).

This issue also falls into the area of utilities rights and the work to protect these by work from the National Consumer Law Center in that there are processes for the shutting off of utilities (Harak and National Consumer Law Center 2007).

This discussion of questions of race is also significant in the context of poverty in Boston as well with another report indicating that high portion of people of color in Boston live in "high-poverty neighborhoods" (Kahn and Martin 2011, 11), There is further exploration that generally notable economic disparity exists in terms of race in Boston (Kahn and Martin 2011, 12). Indeed, concerns relating to inequities in race are evidently relevant for Boston and justice.

Moreover, in his interview, John, a professional who works with water affordability and shutoffs, explored different types of solutions and challenges with water pricing and affordable. He reflected on the types of models that could be used to appropriately find solutions that would benefit the city and the people and keep economics, well-being, and functionality sustainable for going forward. He pointed out that there were different paths that individual communities have taken contrasting the occurrences in Philadelphia and Detroit, both of which have experienced high rates of water shutoffs. In his discussion, he also was able to address the significance of the work that other organizations like the UUSC in this field.

7.4.3 Cost of Water Included

For the residents and water consumers, this cost of water and threats of shutoffs took on different meanings. For many residents their water is part of the cost of rent. Therefore, for some of the Boston residents with whom I spoke, the water was included in the rent for their apartments or places of residence. This meant that the concerns for and understanding of the costs of water were different from those who would pay for the water or face shutoffs. This particular threat of water insecurity from costs of water was seemingly not a major concern for these people who did not pay for water specifically.

As such, some of these consumers who did not pay reflected on their own perspectives on water costs. Some expressed a sentiment of how they had not particularly thought about the cost of water when they were not directly paying for it. Rebecca had noted how when the water was included costs were not a concern and even when she was living outside of the city, while paying for water was inexpensive, she still did not particularly limit her water use practices. Robert considered how costs might relate to a water plant cleaning the water, transporting the water, and waste management. However, he acknowledged how this was speculation, "There is a whole ecosystem of human water interaction, I literally know nothing about, I can just guess." Sue, while acknowledging that she did not think about the cost of water, expressed additional concerns that people might not be as careful as she still tries to be even if they do not have to worry about the price. Here, we see how for some this financial stressor with the cost of water is therefore removed from their concerns. In this, there remains another relationship with water wherein the monetary value of the water relates to how people appreciate the resource itself.

Still for others, the costs of water were considered in the ways in which they had various expenses. For some they sought other ways to monetize their relationship with water. For instance, Alice noted how her water use pattern changed as she moved from having to pay for of laundry, another cost of water, to not having to pay. Other people recognized other features such as the differences between having to pay for hot or cold water. In many apartments, while you may not have to pay for the

water into the unit, you do need to pay heating costs. Included in the heating is the cost to heat water. Thus, you are responsible for the "hot" of the hot water.

7.4.4 Accepting the Price of Water

Other residents did mention the cost of water and had this included in their bills, with both the cost of water and sewerage identified sometimes. For some of the people who were interviewed such as Ellen, Sally, and Brigid, they found that the cost of their water was fairly low. Sally remarked how sometimes she does not even remember paying for it because she finds it so low. For these households the water costs, evidently, were not a direct threat and pressure in their views of water security. They appear not to have the situation wherein water insecurity from costs is a consistent pressure.

Interestingly, for some, the apparently low cost of the water posed another concern. They even commented upon how they thought it might be too low so that people will misuse water. Brigid was particularly clear about how: "I recognize the cost of not having it, I really don't want cholera…Most people don't get it, what is coming out of the tap, it is a fundamental foundation of your life…You pay water and sewer and without trying don't have to think about it again." With this, she not only is mentioning the cost of water but how much she values the water. As she brings in others, she also brings forward new ideas of what she sees as her community's valuation of water. Once more, there is this recurring sentiment that people are taking the water for granted and do not fully appreciate, in this moment monetarily, the water itself. The water for her is a necessity, a highly valued resource and one that she views as worth her monetary investment in it. Therefore, the stressor of water security is not felt by her as one that comes as she incurs costs but instead is one wherein the costs are less than the value and the insecurity of not having water.

Despite, having a relatively low water cost, even in her water use practices, she reflects this type of concern and respect for the resource, "You don't think twice about washing clothes. I have a water efficient washing machine; I don't want to waste water."

This concern for appropriately priced water was paralleled in the concern, which was also expressed by some of the water professionals that the water pricing accurately reflect the cost of the water processes. The state representative further highlighted how the cost of the water and the disposal are built into the rates that people have in their homes.

Water prices (or lack there of) were also compared to other costs of living. Many utilities such as internet or electricity can be fairly expensive. For instance, Massachusetts is ranked as the third most expensive state to live in with an average electricity bill being reported as much as 217 USD per month (Cohn 2018). Boston indeed, has high and greatly increasing cost of living, one such that federal poverty rates are not appropriately adjusted to the situation in Boston to reflect the rates in the city (Kahn and Martin 2011, 14). The same report explained "In 2009, more than half of Boston renters earning less than $35,000 annually paid more than 35% of their income in rent" (Kahn and Martin 2011, 14). It was also estimated that more than half of the population of Boston (excluding students) lived in poverty at the time of the study (Kahn and Martin 2011, 15). Evidently, the costs of living found in Massachusetts and specifically Boston could be a general stressor that goes even beyond water being a financial stressor. Some of the interviewees even tried to cut down on these as well as cost saving measures. Water is simply another cost of living in Boston.

A research note for further consideration beyond the scope of this research is that for some there were differences in prices but it is unclear for this research why the individual households had such contrasting water bills. This may have to do with other factors that the residents did not personally mention. There were some differences in costs per month that people indicated with some being smaller than others, but this could reflect perhaps differences in family sizes or other factors unknown to me.

The implications on water security depending on who pays for water directly or indirectly would be another avenue of consideration and likely depends upon housing situations and housing markets. If a specific community might be composed more of renters in large building there would be a higher chance they are not directly paying for their water than if the community is mainly comprised of single detached units

occupied by homeowners or renters. This difference can be seen in the percent of renters in detached one-unit dwellings. The American Housing Profile of the US Census indicates that while Boston has only 8.4 percent of renters occupying these detached dwellings, Detroit, with its high level of shutoffs, has 36.2 percent of the renters in this type of unit (U.S. Census Bureau, U.S. Department of Commerce, and U.S. Department of Housing and Urban Development 2015a, b).

7.4.5 Water Costs as Problematic

When speaking to residents about the cost of water there were additional perspectives. One resident expressed disbelief that water could be shut off because he saw it as a necessity and a part of a hierarchy of needs. Another resident expressed dismay as she reflected on how the water was too expensive. She went on to say how it is has been increasing over the years. This story reflects a distinctly growing concern of rising water costs, which is recognized by some.

The state representative recalled a story of his interactions in the position as an elected official. He noted how the cost of water was a concerned expressed by his constituents. He explained how the cost of the water and sewage disposal were built into the rates people have. In this way, he was explaining some of the complexity and justifications of the costs as part of the system. Likewise, he did clarify that he did not find that people now were really "screaming" about the cost of the water as they are used to it.

Sidney also reflected on the story her changing experiences with costs of water. Like many of those interviewed, for a large portion of Sidney's time in Boston, over 30 years, she was a renter and water was included in the cost of the rent. About six years ago, however, she moved and became a homeowner in West Roxbury neighborhood of Boston. With this move, she began to pay for household water. As she discussed her water she reflected on some of the water saving measures that she does utilize like trying to conserve dishwater. She generally found the water was not that expensive but she found the transition a "bit of a shock" or surprising. She described this shock and concern as well as she described how written on the water bills it says that if you do not pay water will get shut off. This kind of general idea seems to be a new concern and additional water stressor. She reflected on what that meant and how

that effectively people could not have water. She adamantly expressed her thought: "You could lose water, that's not acceptable" and went on to express concerns for people who might be lower income. She further pondered what kinds of protections with the MWRA or city-council people might have in place. With this changing experience of accessing water in a new manner, she was able to witness and also feel less water security. Similarly, as she considered the situation for those in a lower income bracket, she highlights the ways in which a pricing mechanism and costs of water could pose a threat for at risk, poor communities.

7.4.6 Concern for Commodification

Some of the residents expressed explicit concern with the idea of the commodification of water. In the discussion of dislike of bottled water, there was the first cause of concern was for the environment but there were others that specifically reflected on what it means that water is something that is then commercialized. Sam was one such person who concretely criticized the water commodification. He described how he had a "principle dislike of having to pay for water." He considered the problem how certain things are commodified "that should be a rights" expanding how "Those words not in everybody's head…., but maybe if they are coming from a working class place…these basic needs shouldn't be kept away." Here for him we see the commodification of water, a right, as an issue but he also expands upon it where it is fundamentally rooted in social and class issues. He highlights further how even without the exact language of social justice and commodification, this issue still exists and is pressing. Likewise, Rebecca when she thought about the water bottles used in the buildings where she lived and worked, she further reflected how she was against the water bottle industry. With this critique, there was a sense that she still had to use them but to her, still, there was a larger flaw in the entire situation and industry. Denise also brought in a critique of the water bottle industry describing how the water was essentially the same just with a "fancy label." In expressing these perspectives, the residents added a further nuanced understanding of the systems of commodification and the part of their water in it.

7.5 Causes for Lack of Trust in Specific System

7.5.1 Personal Problems with the System and System Safety:

Some of the residents expressed concerns regarding the specific safety of their personal water. As they brought in these concerns about the safety and quality of their own water there remained questions. As discussed in the idea of the engagement that people have, as they consider their water and what information they lack, in this there is also the degree of uncertainty and thoughts regarding the systems. While questioning what information they lack they also are touching upon this idea that there might be an issue perhaps with the quality of the pipes or other issues. They are expressing their concern, perhaps there is a problem that they do not yet know but that could be dangerous for them or their family.

Rebecca told the story of her experience dealing with a sense of insecurity in regard to her consumption of Boston water. She explained how she had been living in government housing and so had her partner for several years. She described the housing as very inexpensive and that it included utilities like water. The space was one similar to that of a dormitory such that there were certain common spaces like bathrooms and kitchens. However, the building was old, as were the pipes, so she was not supposed to drink the water from the tap. She further detailed how as solution they provided for drinking a water bubbler (in this case meaning a water cooler or unit where there is a very large container of bottled water and a button that is pressed to release the water, when it is used bubbles form; in contrast, for some in the Boston dialect a water bubbler will refer to a drinking fountain with water coming from the pipes). She explained how upon moving in she had to sign forms about safety but still found the water portion confusing. Initially, she had drank the water from the tap because she had heard about the good quality of water in Boston and she had always drank water from the tap growing up. However, when she found out she was not supposed to, she began to drink from the water bubbler (cooler). Rebecca also brought in another consideration of using the water for cooking. She said that she generally used the tap water for cooking but others, who lived there, including her partner, always used the water provided in the bubbler (water cooler). She also began to change her practice with the influence of her partner. Upon this

reflection she also expressed some concern with how she was not sure if it was quite safe to cook with because she was still consuming the water; she described a general sense of ambiguity. This insecurity as mentioned before is linked directly with the age of the building, thus we see the pressure coming with time. So although, as Rebecca was told, the water in the system was good, the pipes of the old building made it unsafe for drinking.

With this insecurity that Rebecca expressed, there are indeed further the questions of equality and fairness. Something to consider with this housing was that it was inexpensive, she explained how she was less concerned about bathing than having housing: "Having housing honestly outweighed questions of what I was bathing in." Likewise, she similarly expressed a feeling that there was not that much choice as the Boston housing market is so expensive.

Sam also expressed some specific concerns he had regarding the safety of his personal household water. Sam is a renter in the neighborhood of Dorchester. As mentioned earlier in the section on information, he had been told by the homeowners that he should drink filtered water at his household and not directly from the tap. Again this is likely, a home specific issue, perhaps also related to older pipes, but again this shows how there is not equal distribution of risk and hazard, but instead depends on the household and what would happen therein.

7.5.2 Concerns for Others Around Them

Several of the people expressed certain concerns that related to both their own experience and those around them. The discussion of experiences with schools emerged. For Sue, she reflected on how her building was older and she thinks about the pipes. She said she was less concerned for her husband and herself but thought about younger children. She elaborated how she worked in schools and also wondered about the quality in the fountains. Here she is reflecting on how the drinking water might be unsafe or concerning particularly for a potentially more at risk population from lead contamination: that of children.

Rebecca explained another experience, which appeared surprising to her. She had worked in local Boston schools and she explained how upon asking where water

fountains were she was strongly told by the students, "don't touch the water fountains" because the buildings were old. She found that each classroom, just as in her housing, had a bubbler (water cooler) in it for providing drinking water. She again expressed a sense of surprise and confusion coming from somewhere where this was not the case. In her work, she grappled with educating children about how the water was good but it was made dirty through the buildings. She also reflected upon the fairness that the old schools had to deal with this issue that water was not safe to drink for the children. Aria made a similar comment about the water in a Boston school next to her home. She explained how at the school near her home the children were not allowed to use the water at all. She framed this situation as concerning and also how it made her reflect upon her own water and if it is safe to use if she is next to it.

7.6 Inequalities Concerns for Other uses of Water

Beyond household water use, which was the main focus of this research, several of those being interviewed also brought in the ideas of other types of water uses. One can once again see the interconnectedness with household water use, waste disposal, recreation, and watershed and systems. For instance, while discussing the Quabbin and the Wachusett Reservoirs the resources from the Department of Conservation and Recreation also provide information on the possible recreational uses (Commonwealth of Massachusetts 2019b, d). This related to the ideas that these water resources are also nature areas and can be used as public spaces. Therefore, with this interconnectedness we can see how these are brought in. A part of this is also further concern for questions of equality.

The use of water is also presented as a question of equality. It can be recreational but as Brigid indicated earlier, it can be a way to deal with the hot humid Boston summers for some people may not be able to afford other alternatives. Others brought up this concern that there is fair access to the beaches. Access to the water for recreation is a matter of equality but once again this is further linked with the ideas of the water itself and if it is safe and clean for people to use if this is the water people are near. Questions may arise concerning how far people have to travel and to

be outside of the harbor area to even get to use the ocean and is it even safe to do so. Similarly, issues like fishing also could be included as points of concern for the people that are living and working with the water. These additional water uses are not strictly part of the household water but as water is connected, so too are they, and evidently they were points wherein people had concerns for equality and justice.

7.7 Building of Trust

A critical aspect of dealing with water insecurity is the building of trust. An element of this building of trust is to ensure that the broader systems of inequalities begin to be addressed. For instance, the presence of widespread prejudices or systemic problems will undoubtedly undermine trust and senses of security. Likewise, significant infrastructural and even safety issues such as those in Flint, can also seriously undermine trust in system. Nevertheless, the work of agencies, organizations, and governments to acknowledge issues and work with communities to address such issues can be an in important step. There can be measures to address the major issues and also measures to ensure the building of trust in the system. Eriksen explores this concern for trust with relation to knowledge and overheating as well (Eriksen and Schober 2017b).

7.7.1 Where There is Trust

This section briefly reflects on how people have expressed where they place the trust in the system. In the discussion with some of the residents, there was a defined sense of trust in the specific water system of Boston. A number of these residents reflected on the features and trust that they felt for the Boston water system. As Robert and Leah, spoke together about the way in which they appreciated the system and spoke of the Boston water, they spoke with a confidence in the system and a trust. Robert highlighted various uses of the water from making ice to giving it to his cat. He reflected how even when he considers that he should perhaps filter it, he still continues to use it and like it. Much like Leah and Robert, others expressed this kind of trust in the way in which they also spoke of their confidence in their water be it Ellen and Brigid with their strong praise of the system or Jacob with his longstanding

confidence in the continuance of the systems. What this could mean is that for them at least in their situation there has been a building of trust.

7.7.2 Building this Trust

This section explores the way in which the water professionals reflected on the importance of trust and the efforts that they took part in to ensure this form of trust building.

Alex, the professional with MWRA experience, in particular, discussed the importance of building the trust and the relationship with the community. They reflected on the work of the MWRA to ensure this trust in the water. He explained how if there was an issue of concern, for instance emerging in the news, they use their own media to explain how this is relevant to the MWRA and the precautions for this. Similarly, they explained how they actually go into communities with a water truck to help people learn about the water and this also can be seen as a trust building technique. They specifically spoke about the significance of the trust-building, transparency, and communication process in comparing the response to an issue once in Boston versus another city, where with transparency there was significantly less confusion.

Similarly, the other government officials such as those from the Federal Agency and Clara of Connecticut reflected on the inequalities that undermine trust and the way in which the dealing with it through both acknowledges the inequalities but also an effort to overcome these and thereby build a trust in the system. This reflection on undermining of trust also relates back to the obstacles of participation (Arnstein 1969, 217). People need to have a reason to trust the system. This could be where to mention that the BWSC website was updated with online forms are clearer.

In summation, the inequalities of the system link with the feeling of trust or distrust that people have towards the system. This trust is informed by concerns for present issues and issues reaching into the future. Facing this lack of trust and inequalities was both a task for residents but also professionals navigating the complex water system. It is through trust building that the insecurity created from the multiple stressors can be addressed.

8 Conclusion

This thesis began by posing a question of: how can talking about water or water stories in the Boston area be informative of why people feel water insecure even if relatively, they have access to enough clean water. Through the analysis of the evidence through the water stories, the thesis sought to resolve this question of how the stories can be useful.

This research was done in the presence of growing national and international concern for water. It explored the attitudes and approaches of both suppliers and consumers of this resource in Boston. Using the lens provided by Eriksen, the water stories told in this thesis show how trust in a system varies with increased knowledge and mobility. Indeed, both factors are evidence of an overheated society. I have also suggested that this has implications for trust, or people's ability to trust the water system of which they are part (Eriksen 2016).

For water experiences and systems, the local, national, and global scales of water security were not isolated from one another. Ultimately, these stories reflect the way in which understanding and engagement with the water system was inherently linked within a time-space compression and accelerated global processes. This thesis has explored theoretical concepts such as *time-space compression* and *overheating* through water stories told during my research in Boston (Harvey 1990, Massey 1994, Eriksen 2016). In these stories, water security was the central theme. These reflections on water security, which emerged in the stories, were both directly related to Boston water and also perspectives on water security as a whole.

Overall, this thesis shows an interweaving web of interactions and understanding of the water security for the city of Boston. This web is spread across scales in the water system administratively as well as across different groups of people who are part of the system. The understanding reaches outward from the local to the national to the global, as the interconnectedness is experienced between these scales. The web of connections and their interplay emerge through the water stories. Evidently, these interconnections define the way in which people interact with the system and think about their system.

The stories track the sense of overheating through the various relationships with water. These stories of water expand from the local Boston experience to broader systems and issues. These span from the creation of the system to the relationship directly with this water history. It moves onto these direct local relationships as people engage within the system. The intersections of the overheating eventually reach beyond the local both in geographical and power systems.

Nevertheless, the web of the stories is not merely the meeting point of people, but also the meeting point of experiences across space and also over time. As water insecurity varies across locations due to factors like economy, environment, and politics, the meeting of these systems is particularly poignant for the understandings. Likewise, the past informs the present, and the stories reveal this portion of the web wherein past and present interconnects in the interactions with the water systems and define one another.

The discussion has shown how water stories incorporate the past to define the present. The past events in water history are complex and have contributed to and continue to influence the occurrences in the present. The stories from the past form a critical nexus wherein the experience of insecurity permeates through time and personal experience such that the pressure is compiled in the present day.

In chapter five, I posed an additional question of why in a relatively water secure place like Boston are people experiencing and still sensing the water insecurity? This question was considered in the context of engagement with the water system. The engagement occurred as people sought information to understand their system, participated in mediating organizations, and the roles that government or semi-government institutions took. Utilizing information both added to the acceleration of the pressures but also gave the opportunity to partake and be involved in the system. Overall, this chapter found that people still actively sought to engage with the system and their personal engagement with the water systems revealed another component in the intersections of understanding.

I have further explored how talking about water can be an expression of spatial compression. People express insecurity towards their own water situation with stories from elsewhere. I have suggested that this is linked to increased mobility and

complex knowledge of insecurities in other places. This form of time-space compression increases the feeling of water insecurity.

My thesis also alluded to how the presence of inequalities and the degree of trust in the system can determine the degree of pressure and anxiety an individual experiences. This was visible in the water stories, which spanned power and relations. People could recognize systemic problems and how these should and could be dealt with. There were also certain instances of people having specific issues regarding injustices that they encountered. Part of this overheated world of water appears to be dealing with these systemic challenges. Thus, these different elements of engagement, time, and space brought together and also became stories of inequalities and the significance of trust.

A dimension of this web of interactions nevertheless, as seen through the stories, remains complicated. Embedded in the interactions and understandings are the ideas of inequalities and inequities in water resources. As water is such a fundamental resource for human life, the complications found in the system through inequalities are critical to defining the nature of the web of interactions as well.

Actions and Relationship with Water

A particular significance of water security and people's understanding is the connected practices and actions. An element that emerged throughout the discussion of people's thoughts on their water is also the ways in which they used it. Water use included reflections on daily water practices but partially embedded in people's expressed concerns was also their use for water conservation be it water efficient machines or brushing teeth in the shower. Additional stories of water practices oriented concerns surfaced in the water stories. Water is something that people use and perspectives on water security are linked to their interactions with it.

Through the discussion and water usage, one can also consider people's involvement with the system beyond their practices. This could involve the avenue that emerged while speaking to government representatives wherein people typically call in regarding issues. This involvement can also be seen in the roles that people took in education of others about water or emerging action in the even the form of activism. The understanding of the water is significant but it also has a concrete potential for

impact on the water systems, which ultimately, people must use if living or working in the city of Boston.

In the presence of an overheated environment with stressors brought on by costs of living, pollution, inequality, aging systems, and uncertainty about the future due to climate change there was, trust in the Boston water present in many of the responses of the interviewees. The stories told of this trust that was developed through access to information, reasonable pricing, and actual performance; with the water consumed being recognized as high quality.

Yet Boston presents a significant case, as trust in the city's water was not always present. Known for its dirty water, progress made in environmental conditions with such work as the cleanup of the Boston Harbor, helped to realign perceptions of Boston water. Likewise, the ongoing efforts of the MWRA to continuously monitor and upgrade the network, the role of environmental policy enforcement, and the work of non-governmental agencies monitor and pressure for change, will help to ensure continued high performance. While not without their differences, government agencies and non-governmental groups often work together to address existing problems and to help identify and protect vulnerable individuals.

Despite this, the evidence from stories of the Boston consumers do indicate a sense of water insecurity due to the reality of failed systems elsewhere, past problems, and certain continued concerns for adequacy and safety of water, if not for themselves, for others. For some this has resulted in thoughtful choices regarding their uses of water.

Ultimately, in the water stories, one sees not merely the web of interaction. Nor does one face only the past and the present, but also how felt water insecurity even can shape the future. This implication for the future is a critical element of the intersection.

8.1 Going Forward

My study of the growing concern for water in Boston can help shed light on heightened water insecurity, as it may appear both locally, nationally, and internationally. In the presence of climate change and the needs of an ever expanding

mobile population, observing a system such as Boston can help us better understand what is going on.

Amongst the rapid pace of expansion and change, consumers and professionals indicate the importance of water resources and staying involved and vigilant to protect these. The uncertainties related to water will increase with climate change. The costs of supplying water can include the need to relocate communities and invest large sums of money both to supply water and to deal with wastewater. It can also include the costs of managing stormwater and flooding, problems that will be exacerbated by climate change. Based on the stories, to succeed in such an endeavor will require a need to inform all communities involved in productive, which involve directly interacting with residents through various means. Despite the possibility of pressure, the stories provided indicate an appreciation for information received and concern when it is lacking, as this transparency allows for more direct, complete answers rather than a plethora of incomplete answers about their own system. The concern can impede trust building, which is critical for advancing any successful and accepted infrastructure project. Pricing, equal access, and systemic inequalities will also be elements that must be clearly addressed through any expansion. Amongst the rapid pace of expansion and change, consumers and professionals indicate the importance of water resources and staying involved and vigilant to protect these.

The research in this thesis could continue to be expanded upon in future studies. There are additional avenues that further research could continue to explore regarding the Boston water that a longer research project involving more data and perhaps delving further into the concerns for inequalities could reveal. Additionally, this type of research could be conducted in other US cities or global cities to explore this overheated time and how it increases experiences of water security.

Water will be a vital resource that, with climate change, will continue to be under pressures. In this thesis, I have shown how webs of connections define interactions with the water system. The world is compressed and growing more linked together and going forward, so too will be our understanding and practices related to water. Considerations of the implications of the perspectives on water traverse borders. With the changing global phenomena from the environmental concerns to political

navigations, the complex web of water interactions will be relevant for other nations be it Norway, EU countries, or non-OECD countries.

Back at the sink in Norway, as the glass fills with water new questions emerge now about this daily beverage. How did it come to this sink and what makes up this system. As consumers, how do we globally, relate to this vital resource and what is its prognosis.

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Appendix A Participants General Water Consumers

*including renting or owning status and where in Boston they had been residents

Alice	Back Bay resident, before Beacon Hill and other locations, renter
Aria	Roxbury resident, renter
Brigid	Boston Resident of South Boston, homeowner
Cecilia	Dorchester resident
Daniel	Boston area locations, renter
Denise	Dorchester resident lives with homeowner
Ellen	Boston Resident of Charlestown, homeowner
Hank	Dorchester resident
Jacob	Dorchester resident, renter and owner
Jane	Allston resident, renter
Jean	Lower Allston, before Fenway, renter
Jessica	South Boston with Homeowner
Kaitlin	Dorchester resident Kaitlin
Rebecca	Charlestown resident, renter
Robert and Leah	interviewed together, residents, renter various Boston neighborhoods
Sally	currently JP homeowner, but before Brighton and throughout Boston

Sam	Dorchester Resident, renter
Sidney	West Roxbury resident homeowner, Roslindale, JP, Dorchester renter
Sue	Boston Resident South End neighborhood, homeowner

Appendix B Participants Professionals

Christina	Water professional with government knowledge
John	Professional with a specialized knowledge of water affordability
State Representative	representative for the state legislation
Clara	Connecticut water professional with government experience
Clean Water Action	an individual who was interviewed
Color of Water Project	an individual who was interviewed
Alex	an individual who had experience with the MWRA
Laura	Individual working with an organization about rivers
Federal Agency	two individuals from a federal agency
Jillian from Office of a Congressman	an individual who was interviewed
Vanessa from the Office of a Congressman	an individual who was spoken with
BWSC	an individual who was interviewed
Water agency professional	an individual who was interviewed

Appendix C Definitions of Terms

Quabbin Reservoir- the name meaning "place of many waters' or "meeting of the waters" comes from the Nipmuc (Nipmuk) people who had lived in the area before their land was taken by the English colonists (Massachusetts Department of Conservation and Recreation (DCR) 2016, Tougias 2002, xii).

Wachusett Reservoir derives its name from a Native American language, possibly an Eastern Algonquin language, meaning a proximity to a mountain or a hill (Earls 2010, 28-9).

Appendix D Interview Guide: Professionals

- What organization do/did you work for or are/were you a part of?

- How long have you been active/ involved and in what capacities? What was your role?

- Please describe how your organization is involved with issues of water access?

To some/ depending on who:

- How does your organization deal with ensuring water accessibility?

  - What factors are considered in the process? This could include affordability or concerns for forms of discrimination?

- How do you work within larger frameworks and between and layers of policy, government, civil society?

- How do you work with communities to ensure/ deal with water access?

- Are there other organizations or access points I should reach out to?

- What issues do you think are important over time and going into the future?

- Why is this a focus of your organization? how/ why has water been prioritized?

- Do you have any other considerations you think important or other resources you think I should look into?

*Interview Guide Subject to Change and will depend on the who I am corresponding with and their roles.

Appendix E Interview Guide: Consumers

How is your experience of accessing water? How do you deal with this?

- Tell me a little about yourself. Can you explain your housing set-up, how long have you lived here?

- How is water included in this?

- How do you feel about your drinking water? How are you effected by your water?

- How do you use your tap water?

- Do you have thoughts on the quality of water? Do you use a filter etc?

- Please describe your understanding/ feelings about how it is priced?

- What kind of information do you have about your water, where the water it is from, agencies, something you would want to know more about?

- Over time have you seen changes relating to water?

- Do you have thoughts on inequalities/ injustices relating to water?

- Do you have any other thoughts about your water or water systems?

Appendix F: Images from Boston

Figure 3: Map of Boston Neighborhoods (approximate boundaries)
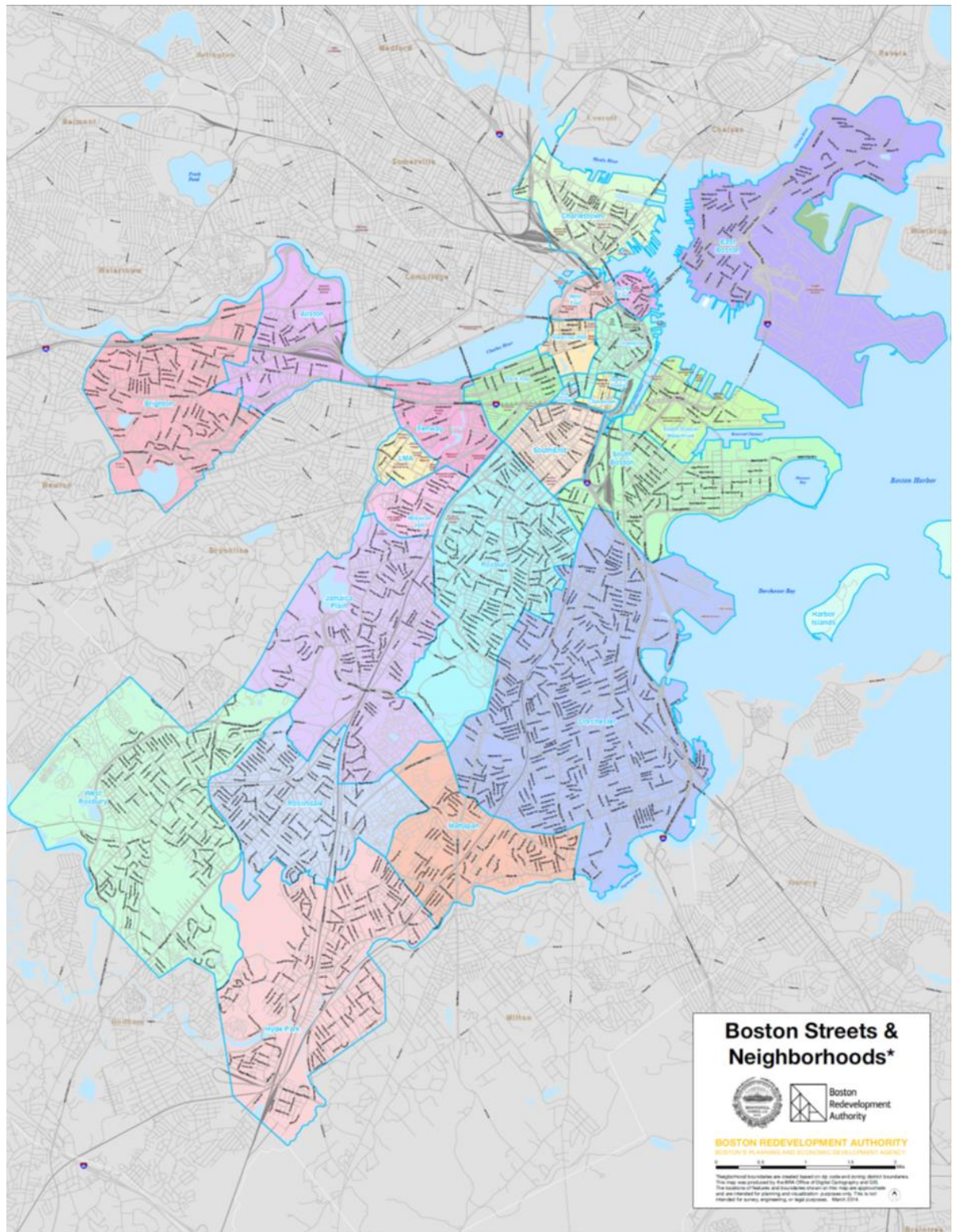
* This was created by the Boston Planning and Development Agency and was confirmed allowed for use May 6, 2019 (Boston Planning & [Economic] Development Agency, Boston Development Authority, and City of Boston 2014)

Image 1: Street fair in South Boston

Image 2: Wachusett Reservoir and Dam

Image 3: Wachusett Dam

Image 4: Wachusett Dam sign

Image 5: Don't dump sewer sign assisted by (Trainor 2019)

Image 6: View of Boston Harbor and Deer Island Treatment Facility assisted by (Trainor 2019)

Image 7: View of the Charles River with Boston on Right and Cambridge on Left assisted by (Trainor 2019)

Image 8: From the Harbor to the City assisted by (Trainor 2019)

Image 9: Wandering through South Boston