



Mind the Gap: An Environmental Justice
Framework for Evaluating Climate Change
Policy in Miami-Dade County, Florida

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Abstract

This research evaluates prioritization of the climate gap in Miami-Dade County's recent climate policy. A review of the pertaining scholarship revealed a gap in the literature; many studies that analyze the equity of experience for climate hazards have not produced a clear, comprehensive, or widely applicable framework by which to assess policy. In light of this finding, this research amalgamated a new framework based on previous environmental justice studies through which the climate gap and other key equity issues could be evaluated. Using this informed but newly devised framework, this research evaluated three of Miami's largest climate-based policies and programs as well as supplementary legislation that bolstered the pursuits of the larger, prioritized programs. As a result, this study found that only one larger program holistically embodied all equity-based requirements outlined by the framework. Based on this finding, this study recommends wider adoption of similar projects and policies in order to protect historically vulnerable and burdened communities against climate hazards.

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Introduction

A nationwide increase in occurrence of climate-related disasters points to the need for improved government understanding, planning, and policy implementation. Developing understandings of past disaster-related politics and policies help inform such policy-makers and communities today as they grapple with this emerging threat.

Despite federal and state concern for climate hazards, past failures at multiple levels of government have forced cities to produce climate programs aimed at mitigation and adaptation in our changing world. City-based policy is increasingly important due to the unique demographics of urban spaces. As of 2014, 81% of the US population lives in cities, and nation-wide, the majority of people of color live in an urban setting (United Nations 2014, Rothstein 2017). As a result, any policy being contemplated in the city is a policy must historical race and socioeconomic disadvantage into consideration. Since historically vulnerable communities experience climate hazards inequitably compared to their privileged counterparts, philosophies of environmental justice and climate justice need to enter as a dimension of these policies.

Miami-Dade County, Florida is a critical site for climate-related policy. The county's topological makeup predisposes the landscape for devastation in the instance of a climate-related disaster, including extreme inundation and hurricanes. Miami-Dade is actively preparing for the likelihood of such event and has recently published several climate programs and policies that aim to mitigate the potential destruction. These policies range in focus and intent, many attempting to preserve the economic or infrastructural integrity of the county. In this way, the policies address physical vulnerability to disaster. But does it protect the people? Miami has a clear history of neighborhood segregation and is home to a majority non-white population. The environmental justice movement recognizes that as a result of housing segregation, low-income communities of color are disproportionately exposed to environmental hazards, including any disaster that results

from climate change. Scholars have therefore incorporated climate justice (CJ) into the larger discourse of EJ (Shonkoff et al. 2011).

The disparity of climate hazard impact is often known as the climate gap (Shonkoff et al. 2011). In order to evaluate Miami-Dade's climate policy, I have created an EJ/CJ-based framework using critical indicators of justice in order to answer the question: Does Miami-Dade County consider the climate gap and other pillars of EJ in contingency planning for coming environmental disasters? In order to answer this question, this research synthesized EJ frameworks of past research, thus creating a nuanced, widely-applicable, and comprehensive framework by which to assess three of Miami's large, priority climate project policies as well as twenty-two supplementary legislations. Evaluating these policy dimensions is critical to understanding who will be protected and who will be overlooked in the event of a climate disaster and whether or not Miami-Dade taken into consideration the known historical disadvantages in formulating and implementing its decisive programs and policies.

Background

Environmental Justice to Climate Justice

EJ scholarship is situated based on understandings of inequitable experiences of environmental hazards based on race and income. Foundationally, EJ attributes some of this disparate impact to be a result of federally sponsored racial segregation post World War II (Rothstein 2017; Shonkoff et al. 2011). In 1994, President Bill Clinton signed Executive Order 12898, which marked the first federal policy-based recognition of EJ in the United States. This bill clearly defined vulnerable populations and sought to equitably distribute environmental impacts across all communities and demographics (United States Environmental Protection Agency 2013).

However, this policy is non-binding and has served more as a recommendation than mandatory criteria for environmental legislation, leading to a failure to properly prevent or protect against climate hazards (Pulido 2017; Bullard 2008). As a result of the executive order, the U.S. Environmental Protection Agency (EPA) defined environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (US EPA 2014). The EPA developed this definition following the First National People of Color Environmental Leadership Summit in 1991, where the scope of EJ was broadened through seventeen principles. This summit was the first official articulation that outlined an environmental justice framework, which was subsequently reinforced through other EJ research (Bullard 2001; Schlosberg 2012). More recently, in 2014, the Intergovernmental Panel on Climate Change (IPCC) report mandated that cities must classify and evaluate demographic risk and vulnerabilities in order to construct effective, equitable policy and strategy, as well as implement and enforce these justice-based programs (IPCC 2014). However, the creation of an Executive Order and the 2014 recommendation from the IPCC does not guarantee equal protection or equitable impact due to its lack of specific, racialized language, deficient accountability structures and the policy’s inability to be applied in diverse environments. Since the incorporation of environmental justice into federal law, many studies have been published on the actual implementation of equity and justice issues into environmental planning. This research has found contemporary policy lacking in commitment to justice issues, despite a national increase of environmental sustainability policy (Warner 2002; Portney 2003; Saha and Paterson 2008).

With increased climate risks due to global climate change, climate justice emerged as an increasingly relevant and pressing issue for vulnerable communities around the world. Climate justice (CJ), as an extension of the environmental justice movement, incorporates the understanding

of the unequal impact of climate hazards on vulnerable populations. Unlike EJ, which synthesizes concepts of disproportionate exposure of environmental risks (air pollution, toxic waste sites, etc.), CJ provides a narrower understanding of the specific environmental burdens caused by climate change. These afflictions may include: exacerbated economic blows post climate-related disaster, or geographic vulnerability within an urban setting due to historical placement (Bullard 2001). This burden gap is often referred to as the “climate gap” (Pulido 2017). Despite these variations in impact, both CJ and EJ prioritize environmental-based burdens on vulnerable communities.

Climate policy must be place-based in order to properly address the particular needs of the local geographic -and demographic- makeup. Climate change impacts will be felt in different ways by different people. In this way, climate policy can be more powerful when enacted on a smaller scale, such as countywide level (Green 2016). More importantly, this narrower scope can enable legislators to recognize, categorize, and curate policy to match that of the ecological and human environment (Schlosberg 2012).

The Importance of Miami in Understanding Climate Justice

Miami is vulnerable to climate change both in terms of demographics and physical predisposition. Climate change takes many different forms, including extreme and rising temperature and increased risk of flooding due to extreme precipitation and sea level rise. These risks alone have a multitude of consequences, for example damage to infrastructure, contamination of potable water sources, depreciated public health, loss of private property, and reduced property values. Clearly, climate change represents an extreme financial burden. In fact, the World Watch Institute reports that the U.S has allocated more than \$1 trillion in reconstruction and rehabilitation efforts since 1980 (Worldwatch Institute 2017). This statistic is particularly daunting for predisposed regions,

such as Miami, that is cited as being one of the most hurricane-prone cities in the world (Southeast Florida Regional Compact 2012).

An overview of the demographics of Miami also provide insight into who is vulnerable to the imminent changes, particularly as they align with historical concepts of disadvantage and the climate gap. Miami is home to 2.6 million people. As of 2015, 15.1% of the residents were white; 16.9% Black, 65.6% Hispanic or Latino (American Community Survey 2016). Poverty is pressing issue in Miami, with 19.9% of the population considered poor or struggling in 2015 (American Community Survey 2016). Race and income are key determinants for the experience of an environmental disaster, in terms of disaster preparedness and post-disaster resiliency (Bullard 2008). Historically, non-white populations are less prepared for climate emergencies, and relying on defective precautionary measures in the event of a disaster than their white counterparts (Peacock 2003; Burke, Bethel, and Foreman Britt 2012). Hispanic or Latino residents were identified as being less likely to take preventative measures and follow advised protocols during a flood (Perry, Lindell, and Greene 1982). Relaying this data to the climate policies and the potential climate issues facing Miami reveal the pertinence of this study and its potential contributions to the environmental justice movement. Additionally, understanding a community's historical disposition in the face of an environmental disaster, such as preparedness according to race, enables policymakers to enact precautionary and directed policies that address researched deficits.

Heat: Demographic Vulnerability

Increased temperatures are caused by excess greenhouse gas (GHG) emissions. The Intergovernmental Panel on Climate Change (IPCC), in its Third Assessment Report (TAR), warned of a higher maximum temperature (or more hot days and increased heat waves) and a lower minimum temperature (more cold days and increased cold waves) (IPCC 2001). Research links

exposure to heat waves and race, finding that low-income communities and communities of color are more likely to experience heat waves based on their placement in the inner city (Schulz et al. 2002) These disproportionate exposures can be deadly. Increased temperatures have deadly consequences for people of color, as African American citizens are at the highest risk of mortality (Basu, Feng, and Ostro 2008). In this way, cities conscious of climate change must understand this correlation between greenhouse gas emissions and race and income in order to protect these communities.

Flooding: Physical Vulnerability

Climate change and increased climate related events exacerbate Miami's geographic vulnerability to hazards. In addition to hazards such as rising temperatures, heightened precipitation and Miami's physical situation between the Gulf of Mexico and the Atlantic Ocean increases Miami's risk of inundation (Southeast Florida Regional Compact 2012). In addition to being prone to hurricane and upsurges of rain, the rising sea level also contributes to Miami's pressing risk of flood. According to studies published by the Regional Climate Leadership Summit and the Regional Climate Action Plan, the sea level is predicted to rise 3-7 inches by 2030 and 9-24 inches by 2060 as a condition of a changing climate (Southeast Florida Regional Compact 2012). Miami's elevation and infrastructure are such that the inevitability of flooding remains a priority within their climate planning. In the case of a flood, sectors including transportation, commerce, housing, schools, public health, and private property are at extreme risk for damage or diminishment.

As outlined, the potential danger of inundation has led to a plethora of environmental studies and subsequent policy that aims to fortify every at-risk aspect of the city. The South Florida Water Management District has assessed geography-based vulnerability for years, evaluating and buttressing infrastructural projects in hopes of mitigating the potentially devastating effects of a

flood (Southeast Florida Regional Compact 2012). These studies have been transformed into recommendations, and then into policy that target community-based initiatives as well as county-wide efforts of mitigation. These policies are key in understanding who will be protected and how the county will achieve these goals. From these policies, this paper evaluates themes of the climate gap to understand who carries the burden in this geographically precarious zone.

Flooding: Demographic Vulnerability

As previously discussed, flooding is of particular concern to Miami-Dade County. Given the demographic data, Miami's population aligns with previous research that has linked housing segregation and environmental hazards. Low-income earners and people of color are generally concentrated in low-elevation, high-flood risk areas in Miami, as well as cities across the United States (Pastor et al. 2006; Montgomery 2014). A study conducted on Hurricane Andrew in 1992 revealed that Black households were disproportionately located in poor quality housing in geographically vulnerable locations (Peacock, Morrow, and Gladwin 1992; Rothstein 2017). This linkage between flooding, housing, and race reveal Miami's comprehensively defective policy in protecting historically disadvantaged communities in the event of an extreme climate hazard.

Hurricane Katrina: A historical example of climate gap negligence

Hurricane Katrina, which swept through Louisiana in 2005, is helpful in understanding the climate gap as it relates to urban planning. New Orleans has comparable demographics to Miami, with over 60% of their residents being people of color and 26% of the population under the poverty level (American Community Survey 2016). Post-Katrina, deficiencies in the city's climate disaster preparedness were revealed and the importance of EJ within policy was revealed. In particular, affordable housing and access to transportation were key indicators in one's personal experience of

the disaster. These two variables were critiqued in accordance with historical understandings of vulnerability to reinforce the intrinsic relationship between race, income, and experience of the disaster. Bullard (2008) cites transportation as a pivotal indicator of the hurricane for people of color (Bullard 2008). In 2005, more than one-third of Black residents in New Orleans did not have cars and could not evacuate the city despite warnings of danger. In this way, the climate gap was exacerbated through the lack of transportation planning.

Additionally, housing infrastructure caused minority communities to bear disproportionate burden. As majority Black residents resided in affordable housing or in low-income neighborhoods, the integrity of the buildings and the infrastructure in those divested neighborhoods in general led to increased property damage and eventually the inability to inhabit the homes (Bullard 2008; Colten 2006). After the Hurricane, four of the largest housing projects were evacuated due to structural damages, ultimately displacing residents of 4,500 units (New Orleans Preservation Timeline 2007). This study of infrastructural disadvantages lends to future climate planning, preparation and understanding how the city can alleviate the negative effects of such a climate hazard. Through implementation of these key sectors, policy makers have the ability to rectify historic disadvantage.

Recent Climate Policy in Miami

As the climate vulnerability needs have been outlined, a look at the policies and programs Miami invests in portrays how the county manages these known threats. The following is a brief description of the three large-scale, prioritized climate program policies and the supplementary resolutions published and enacted in the last decade.

GreenPrint: Heat, Energy, Greenhouse Gas Emissions, Sustainability

In 2009, the ICLEI-Local Government for Sustainability selected Miami-Dade County to enact a pilot sustainability plan that would be used as a model on a global scale (Alvarez et al. 2010). The *GreenPrint* Plan is Miami-Dade County's commitment to environmental issues and aims to provide a framework for sustainability that integrates social and economic issues for eligible communities. This extensive plan of 137 separate initiatives outlines exactly how the county will address water and energy efficiency, land use and transportation, sustainable economy, public health, and protect natural resources, including clean air, ecological preservation, and sewage (Alvarez et al. 2010). This plan also encapsulates Miami's Climate Action Plan (CAP), which will be outlined more specifically later. The *GreenPrint* Plan incorporates contemporary climate-related research as well as specific goals for addressing and mitigating outcomes of increased climate-related disasters. In this way, the *GreenPrint* plan makes obvious the connect between climate change and the need to adapt ways of protecting the city (Alvarez et al. 2010). The four overarching goals can be found in explicit detail in Appendix 1.

Climate Action Plans: Sea Level Rise, Mitigation

Miami-Dade extends the *GreenPrint* plan and connects their climate efforts on an international platform through the implementation of the specialized Climate Adaptation Plan. Climate Action Plans, or CAPs, are one way that cities across the world, including Miami, have confronted climate change urgency through policy (IPCC 2014). These plans aim to both mitigate and prevent effects of the changing climate. Formally defined, CAPs are city-based initiatives that address "environmental sustainability... and disaster risk reduction... [and therefore] focus on adjusting to future climate conditions (IPCC 2014). CAPs are implemented globally as a feature to the Compact of Mayors, which is an organization that compels climate-related policy on a city-wide level. Over 7,400 cities are members of this Compact, highlighting the relevance and authority of

this organization. Miami's CAP, published in 2017, engages with pertinent climate issues, including water-related issues (flooding, potable water, rainstorm damage, to name a few), specific methods for reducing greenhouse gas emissions, for land use, and sustainable transportation ("Climate Change Action Plan" n.d.).

The Climate Action Plan outlines its overarching goals of:

1. Understand and respond to current and future climate change impacts
 - a. Integrate local climate change indicators with existing emergency management, storm water planning and infrastructure planning.
2. Reduce greenhouse gas emissions
 - a. Reduce greenhouse gas emissions by 10 percent by 2015, working towards 80 percent reduction by 2050 to advance the Cool Counties Program commitment.

Adaptation Action Areas: Sea Level Rise, Transportation Infrastructure, Adaptation Planning

One of the more recent policies that is based on the precautionary sanctions is the Adaptation Action Area (AAA). The Adaptation Action Area was legalized in 2013 in order to provide and fortify climate-based plans for regions that are vulnerable to flooding and other impacts of rising sea levels as part of the Southeast Florida Regional Climate Action Plan (Miami-Dade County 2015). Starting in 2016, Miami-Dade County began fulfilling this resolution by appointing the Arch Creek Basin as an AAA, making this region the pilot program countywide (Urban Land Institute 2016). An area designated under this type of planning would be utilized in identifying regions that are most susceptible to extreme high tides, extreme rain, or storm surges. This designation would inform planning; distinct departments could be held accountable for their particular efforts as well as collaborate with different sectors to maintain holistic protection and infrastructural renovation. Based only in the specific region, AAA's are project-based and

designation of AAA is subject to change based on need (Miami-Dade County 2015). In this way, AAA's are dynamic and assess needs on a relative basis. Additionally, to reinforce the place-based planning, AAA's uniquely quantify vulnerability based on populations and communities. AAA can thereby appropriately coordinate plans of action according to relevance to the area and the inherent resources rather than distribute broad-stroked recommendations.

Arch Creek Basin, located in northeastern region of the county, is a 2,838-acre district that includes municipalities of North Miami, Biscayne Park, North Miami Beach, and Miami Shores. This sector of the county has diversity of income and race, as well as burgeoning commuter-rail station that presents itself as ideal for an AAA study. In addition to alignment with AAA principles of equity, this land is susceptible to flooding, reportedly classified as "high-vulnerability to flooding" with 67% of the site categorized as Special Flood Hazard Area by FEMA (Urban Land Institute 2016).

The Arch Creek Basin AAA focused on three specific areas in the context of developing long-term planning and strategizing for maximum resilience. Based on the infrastructure of the region, the AAA emphasizes the construction of a new commuter-rail line, and two communities/neighborhoods that are vulnerable to flooding due to their not up-to-code construction according to FEMA Flood Insurance guidelines. The remainder of this program outlines recommendations including: building on high ground, development of social resilience, restoration of natural systems, and accountability in the implementation of the Adaptation Action Area. These recommendations will be analyzed later.

Legislation and Supplementary Resolutions

In addition to these prioritized and comprehensive policies, I will be evaluating twenty-two of Miami's climate and sea level rise policy in the past decade. These resolutions range in focus,

intent, and execution. However, these policies exemplify contemporary legislation of Miami-Dade County that work to fulfill the goals of the previously explained larger policy concepts. In this way, these twenty-two policies represent small-scale legislative efforts to uphold and supplement climate-related goals presented in the larger prioritized policy programs (*GreenPrint*, CAP, AAA). These policies can be found in Appendix 1.

Literature Review

How to approach climate justice policy

There are extensive analyses of CJ and much debate about the appropriate metrics for climate justice and which approaches will mitigate the unequal effects of climate-related disaster. Often, climate justice is measured through several methods, for example “polluter pays models”, which account for historic disparities and disadvantages, “fair share models”, where emissions are equally allocated, and “various rights-based models”, where governments and activists develop rights according to neglect and deficiencies (Schlosberg 2012). However, Schlosberg (2012) argues that none of these methods can properly measure all of the vulnerabilities connected to climate-related disasters (Schlosberg 2012). Instead, a “capabilities approach” would unify specific social and political needs and vulnerabilities to the environment and outline place- and community-relevant legislation (Schlosberg 2012; Wolff and de-Shalit 2007). However, this language has not percolated into all discussions of climate policy at the city level. Chen et al (2016) evaluated several CAPs to determine that “no-regret adaptation” plans are the most effective and equitable, as they frame multiple climate hazards in the context of non-climate related urban issues (Chen et al. 2016). Despite this lack of unifying language between the two findings, it is important to highlight that the

most effective policy, according to these designations, incorporate demographic information with regionally-specific data.

Scholarship explores the debate concerning which level of government should sponsor and standardize climate related policy. Pulido (2017) explores and debates state and federal intervention for environmental racism through an environmental justice lens. Pulido examines lawsuits against government agencies to emphasize that despite citizen-based efforts, policies which ignore racism have failed to address the climate gap (Pulido 2017). At a national level, the EPA can be used as a federal entity that either addresses this injustice or actively chooses to ignore it. Overall, research finds the federal government as failing to intervene to equitably protect citizens, resulting in hundreds of complaints against the EPA, DOT, HUD for neglect of vulnerable communities (Pulido 2017). These lawsuits exemplify federal negligence of equity issues, thus emphasizing the need for city-based intervention.

In addition to federal failure to prioritize equity, Pulido problematizes state intervention in the context of environmental justice, referencing a slew of policy that has failed to be comprehensively implemented for the benefit of all racial groups. Congruent to law suits against federal entities, environmental injustice cases filed against the state exemplify the state's lack of aptitude for spotlighting the climate gap. Pulido argues that this fruitless legal action is due to the nature of the state, as it promotes disparity for its own success, and elects to sacrifice communities of color for the purpose of capital prosperity (Pulido 2017). In this way, states have historically failed to address such issues and are therefore found to be neglectful of historical disadvantage. Consequently, cities have been forced to take on environment justice-conscious policy and attempt to minimize disaster. Due to the inefficacy of states, we must now look to cities as leaders of inclusive and radical policy that both addresses manifestations of climate change and racial justice.

Instead of these authorities, research points to cities as being prime for adapting climate policy that is both efficient and relevant. Climate policy on this scale has the potential to be more effective, as it can be designed for the particular attributes of the population and geography that inhabit the urban space (Green 2016). These policies have a greater chance of enacting tangible change and promote future equity projects (Green 2016).

Issues with effective climate policy

As research points to cities being the ideal stage for climate policy, scholars have explored the issues within effective policy and critiqued the burgeoning types of enacted legislation. Historically, climate hazards have been considered risk-specific rather than cause-specific. This means that cities are likely to address manifestations of climate change rather than consider and alter their personal impact to mitigate such causes (Koski and Siulagi 2016). However, Koski and Siulagi offer that climate adaptation plans could be changing. Novel research primarily focused on urban planning and design as methods of contextualizing increased frequency of climate-related disasters for urban settings (Dhar and Khirfan 2017). As a result of these investigations, cities are now integrating strategy and policy to incorporate climate-oriented infrastructure, planning reform, insurance policies, urban development mindfulness, in addition to special attention towards an increase of behavioral and cultural understanding of climate-related issues (Shi, Chu, and Debats 2015). Climate action plans (CAPs) are trending across America, but Shi et al. recognize the infantile stage of such commitments. In fact, despite 60% of cities discussing and designing adaptation plans, only 9% are implementing any practices (Shi, Chu, and Debats 2015).

Indicators of climate policy implementation at a citywide scope

Although governmental and scholarly institutions are increasingly integrating climate policy, including climate adaptation plans, there are many barriers to integrating such legislature. Qualitative research in this field has determined several attributes of local governments that either restrict or promote adaptation planning. Such indicators include: deficient resources, unconcerned leadership, access and distribution of climate information, and general cultural beliefs of the urban community (Aylett 2014). Acknowledgement of these characteristics are key in considering the effectiveness and possibility of implementation.

Emergency managers and disaster planners are key players in organizing and coordinating policy, as opposed to environmental groups that focus on mitigation efforts instead of citywide risk evaluation and legislation (Koski and Siulagi 2016). Many researchers have uncovered indicators in predicting a city's capacity for climate mitigation and adaptation. For example, Shi et al's determined these indicators accurately encapsulate a city's ability to integrate climate adaptation planning. As an expansion of cultural concern, Shi et al find that personal experience increases the possibility of a city's adaptation planning. In fact, "the odds of a city planning for adaptation will triple when respondents say that their city has witnessed changes in precipitation, temperature, and coastal conditions" (Shi, Chu, and Debats 2015). Their study also distinguished between the individual and the state, as they found no correlation between statewide adaptation planning and citywide preparation, meaning that the individual has more influence in the implementation of climate adaptation policies than the state legislators. This finding also indicates that any state measures "have yet to penetrate at the local level" (Shi, Chu, and Debats 2015). In the absence of individual participation and concern, Shi et al identify a vicious cycle between "low political support" and a municipality's ability to booster staff, designate significant funding, and integrate other administrative bodies into the plan (Shi, Chu, and Debats 2015).

Gaps in Existing Environmental Frameworks

Despite the obstacles of enacting climate policy, scholars have conducted studies evaluating diverse climate change manifestations, including issues of sustainability, equity, and community impact. Many scholars have debated ways to measure equity within environmental policy (Finn and McCormick 2011; Murphy 2012; Bullard and Johnson 2000; White-Newsome 2016; Bullard 1994; Schlosberg 2012; Adeola and Picou 2016). Within their evaluations, scholars conflate issues of sustainability and environmental equity in order to produce a comprehensive policy (Saha and Paterson 2008; Murphy 2012). Additionally, these studies find a lack of equity prioritization within city policies across the country (Finn and McCormick 2011). However, none of this research produces a clear, easily-applicable EJ framework that has the capacity to be applied to future studies. Saha and Paterson evaluate this sustainability and create a framework based on protection initiatives in past research (Saha and Paterson 2008). These findings, however, do not make a strong enough connection to the importance of equity in climate hazard experience. For this reason, the framework and findings of this study are not transferrable to this paper. Murphy's study conducts broad overview studies of global, national, and city-based policies, evaluating for equity, sustainability, participation, and social cohesion (Murphy 2012). These criteria, however, are difficult to apply to other research as they are policy specific and are largely summations of findings within the policy, rather than acting as a predetermined, applied framework. White-Newsome overviews methods for implementing CJ concepts into policy at the federal, state, or city level as well. However, this study fails to produce a succinct list of requirements within a framework, thus is unusable for the purposes of my study or future projects. However, White-Newsome does suggest that policies should incorporate intentional rights and benefits to low-income communities of color in addition to establishing institutions for implementation and accountability for the fulfillment of these rights. Furthermore, this research highlights the essential need for community engagement in decision

making, citing these local organizations as key stakeholders and deserving informants of burgeoning policy. This recommendation is indicated to be implemented on a federal level and throughout several congressional departments. For the purposes of this research, this recommendation will be scaled to the city level. Additionally, this study did not discuss historical “burdens of proof”, or evidence that disenfranchised communities have had to ameliorate and bring to light issues that affect their community. This neglect is critical to highlight because although policymakers should collaborate with community-based organizations, it should not be the sole responsibility of the vulnerable populations to mitigate and prove their disproportionate experience (White-Newsome 2016). As explained, many of these frameworks are vague and reveal a critical gap in the literature surrounding the climate gap and appropriate implementation of its concepts through policy. Bullard and Johnson present four key attributes that are key in the development of a EJ framework. These criteria include: a public health model of prevention, a requirement for the burden of proving environmental hazard impact to be placed on authoritative bodies, and clear retribution efforts for historically disadvantaged communities (Bullard and Johnson 2000).

The deficit of a universal climate gap framework led this research to develop its own methodology for evaluating city policy for philosophies of environmental justice. This novel framework incorporates and is founded in Bullard and Johnson (2000) as well as Murphy’s (2012) published environmental frameworks and EJ findings from past climate disasters (Bullard 2008). Using multiple equity-, sustainability-, and environmental justice-based frameworks, I devised my own method for quantifying the climate gap in Miami. Although these frameworks are not inherently linked, a synthesis of their findings informed my own framework creation. Based on their recommendations, I suggest a comprehensive and applicable framework by which to evaluate the consideration of the climate gap in Miami-Dade County’s climate-related policy.

Methods

Devising a new framework

In order to answer the question of whether or not Miami-Dade County incorporates the climate gap into policy, I constructed my own framework based on the literature and research of other EJ/CJ scholars (Saha and Paterson 2008; Murphy 2012; Finn and McCormick 2011; Bullard 1994, 2008; White-Newsome 2016). The framework is as follows:

1. Values prevention of climate hazards over post-disaster mitigation
2. Honors historical understandings of climate-hazard causes and requires burden of proof on the responsible or authoritative party
3. Defines and describe vulnerable groups based on historical evidence of disparate burden and exposures
4. Demonstrate acute concern for intergenerational impact
5. Prioritize need for infrastructural renovations that historically disadvantaged vulnerable communities
6. Promote community-based engagement and prioritize community-cited environmental protection needs

This framework, unlike those reviewed in previous research, allows for particular evaluation of inclusion or exclusion of the climate gap. Frameworks from other studies have not emphasized equity throughout each criterion in every basis of analysis. My derived framework is therefore centered on addressing the climate gap through descriptions and definitions of vulnerability while still maintaining the ability to be applied to many different physical and demographic environments. For this reason, my framework can fill the gap of research that neglects to possess universal-application characteristics.

The first principle of the framework was included in order to stress prevention-based conceptualizations. Instead of having concrete formulas on what-do-to in the case of an emergency or hazard, policies based on equity should be prevention-centered, as the region must take responsibility for any contribution to the negative effects of climate change and work actively to remedy these sources.

The second principle is based on recommendations from White-Newsom (2016). As previously described, vulnerable or affected communities have had to be the main initiators of change, armed with evidence of their negative climate or environmental experience and therefore be the ones to enact change to alleviate these occurrences. In this way, the second framework re-centers the equity principle, as governments and other authoritative bodies must hold relevant parties, such as large corporations, accountable for their pollution or other contribution to climate change. This will ease environmental and economic impact for the vulnerable communities.

The third principle embodies the essence of the climate gap concept. This precept calls for the clear naming of vulnerable groups in the study or policy area, including both racial information and income data. In this way, this principle can actualize and contextualize who is vulnerable and in what ways are these groups likely to be impacted. Without fulfilling this key requirement, it is hard to evaluate whether or not a policy truly considers historic burden and actively ameliorates the issues.

The fourth principle is connected intrinsically with the first principle of preventative measures. The consideration for intergenerational impact is necessary as it can manifest in educational programming or equity-based re-zoning. Education curriculums could teach communities about sustainability shifts at an individual level, new programs instituted by the government for environmental protection, and more. Re-zoning laws or other construction policies linked to climate impact connect to intergenerational concern because they could mandate more sustainable practices, thus benefitting those to come.

The fifth principle is based off of recommendations and findings of Bullard (2008). These conclusions were discussed in detail in the literature review, but to give a cursory overview, Bullard found that both housing and transportation were key infrastructural indicators of how one experienced the climate disaster. Low-income communities of color was the category most likely to live in public housing and to either not own a car or to rely on public transit. As public housing was decrepit and unprotected, many of these families faced displacement post-Katrina as well as suffered greater economic loss than other groups (Bullard 2008). Furthermore, these groups as they did not have a car and public transit was infrequent or not operational, were forced to stay in the city despite evacuation warnings and therefore experienced greater loss (Bullard 2008). These findings are key in prevention- and equity-based policies. As programs seek to renovate their cities to prepare for disaster, these two sectors must be considered in order to protect the over-burdened communities.

The sixth and final principle focuses on the necessity for community-based cooperation with decision-makers. Based on recommendations from White-Newsom (2016), community participation is necessary for the empowerment of the people's voice. Without collaboration, the needs of the residents cannot be prioritized and therefore cannot be remediated. In addition to be informants of the policy, the community partners should be written in to have partnership and association with the government bodies in perpetuity. Without such planning, the needs of the community cannot be fully or properly addressed. In consideration with the second pillar of this framework, community-based participation does not mean that these members will be the ones proving their experience or be held entirely responsible for any contributions. Instead, the community partners can inform the ailments and work alongside policy makers to have their needs addressed.

Application

I applied this framework to Miami-Dade’s three “program” policies, which I define as larger, prioritized, comprehensive and goal-based plans that are implemented both across the county (*Green Print*, CAP), or are based within a specific region of the county (AAA). Within each program policy, thorough readings of the background and prior research were considered and evaluated according to their subscription to my EJ framework. These programs were selected based on their recent publishing date, their expansiveness, and their significance as represented in the supplementary resolutions.

In addition to these priority policies, I performed a textual analysis of twenty-two of Miami-Dade’s climate and sea-level rise-related policies. These policies are auxiliary resolutions and approvals of projects that support the clearly defined goals laid out in the priority program policies. These legislations were analyzed individually but an aggregated quantification of these policies revealed how the county was supplementing the priority policies through relatively minor efforts. The twenty-two policies, with accompanying date of enactment and a brief description can be found in Appendix 2.

Findings and Analysis

The findings of this project reveal that all of the categories of my framework were represented when evaluating the climate policy as a whole. However, a closer look reveals that some areas are more prioritized than others. The following is a description of the analysis of each of the prioritized policies and a summation of the supplementary resolutions. A synthesis of this information can be found in Table 1.

Table 1. Findings

Policy Name	Hazard Prevention	Burden of proof	Define demographic vulnerability	Intergenerational impact	Infrastructural vulnerability	Community-Based Partnerships
Climate Adaption Plan (CAP)	x	x		x		
<i>GreenPrint</i> Plan	x	x		x	x	x
Adaptation Action Area	x	x	x	x	x	x
Summation of supplementary legislation	82%	54%	18%	36%	50%	0%

CAP Analysis

CAP: Hazard Prevention

The Climate Action Plan prevents climate hazards by identifying many of the predicted disasters, including sea level rise, rising temperatures, potable water contamination. This plan has tangible goals for reducing the city’s exaggeration of these disasters. Furthermore, this plan outlines methods by which to reduce greenhouse gas emissions which are known perpetrators and sources of climate change. The CAP identifies sectors which could reduce these negative outputs, such as shifts to sustainable energy in transportation sectors. In this way, the CAP prevents climate hazards with clear, tangible goals, fulfilling framework requirement (1) .

CAP: Burden of Proof

The CAP pinpoints areas which are most responsible for greenhouse gas emissions and presents tangible numbers by which the county aims to produce after their regimented plan. This

policy cites Water and Energy Efficiency, Responsible Land Use, and Smart Transportation as the sectors by which the government will enforce regulatory policy that promotes fewer emissions. The policy aims to create “green government role models” through partnerships with public health agencies, transportation experts, construction firms, and more. Furthermore, the CAP vows to enact policy that requires contractors to retrofit energy and water housing infrastructure to promote energy saving and subsequently reduce emissions. By not requiring the homeowner to fund this construction, the government removes the burden of emission from the layperson and places it onto the policymaker and corresponding business. One of the strategies that the CAP offers is financial incentives for residential reduction of energy, particularly as they cite that “Florida’s per capita residential electricity demand is among the highest in the country” (“Climate Change Action Plan” 2011). Although residential responsibility is key, the CAP offers workshops to educate people on individual reduction strategies, as well as financial incentives for household or commercial reductions. In this way, the burden of proof as well as admission of exorbitant emissions falls largely on the producer, the government, instead of the citizens. Therefore, the CAP fulfills framework point (2).

CAP: Demographic Consideration

Vulnerability is identified several times throughout this program. Most frequently, the CAP cites geographic vulnerability and ecological risk, such as Biscayne National Park or the Everglades National Park, which is home to endangered species. Climate disasters, including flooding, have the potential to devastate natural habitats and contaminate potable water. However, beyond stating the danger of low-lying communities, the CAP neglects to acknowledge the specific demographics of these regions and the associated anthropological risk (“Climate Change Action Plan” 2011).

Therefore, the CAP neglects to incorporate framework requirement (3)

CAP: Intergenerational Planning

Intergenerational Planning is one of the core values explored by the CAP. In addition to hazard mitigation, the CAP seeks to alleviate future burden through set programs of increased environmental sustainability and continued collaboration between multiple governmental wings and organizations to minimize an issue before it occurs. For example, Miami-Dade County vows to continue collusion with the U.S. Geological Survey to create a more resilient, durable, and specialized water flow system that will protect the region's potable water and aquifers. These collaborated practices emphasize the CAP's attempt to protect future generations from potential hazards, thereby fulfilling framework requirement (4).

CAP: Infrastructural Vulnerability

The CAP cites transportation and land use as key urban attributes that contribute to emissions. The outlined plan discusses a re-imagination of urban design, which includes changes in parking, development of pedestrian, bicycle, and transit-friendly corridors, and increased access to public transit. These goals however, are focused on reducing the use of a personal car instead of emphasizing the transit need for vulnerable populations that rely on public transportation in the event of a climate disaster, as it exacerbated impact for low-income communities of color in Katrina 2005 (Bullard 2008). Although the aim is to reduce GHG emissions, the CAP transportation planning does not explicitly connect the need for vulnerable communities, and therefore does not fulfill framework requirement (5).

CAP: Community-Based Partnerships

Despite mentions of leadership, connections, and communication, the CAP does not define established community-based organizations that are currently working within the climate justice

field, nor does it seek to promote future partnerships. Instead, it mentions the potential collaboration between private and public leaders of organizations. This effort, therefore does not meet framework requirement (6), as it fails to prioritize contributions from organizations that voice concerns of local residents but rather emphasizes the singular leadership from within a government body.

GreenPrint Analysis

GreenPrint: Hazard Prevention

One way that the *GreenPrint* Plan works to prevent future climate disaster is by establishing specific goals for Leadership. Aligned with this larger policy, sustainability means the reduction of emissions in addition to other environmental transformations. Therefore, explicit commitment for leadership that values sustainability could mean that the future decision makers of the County will be like-minded and environmentally-driven. This type of commitment will implement sustainability pillars in “local government strategic planning, business planning and in fiscal decision making” (Alvarez et al. 2010). If sustainability practices are repeatedly taught and emphasized, the surrounding topics have a likelihood of remaining contemporary. In this way, the leadership goals fulfill the framework recommendation (1).

GreenPrint: Burden of Proof

One way that the *GreenPrint* plan alleviates the burden of proof from Miami-Dade residents is through the U.S. Department of Energy’s Energy Efficiency and Conservation Block Grant program (EECBG) that was awarded to the county in 2009. This program funds energy workshops, light bulb exchange programs, as well as energy saving incentives for commercial businesses and homes. Additionally, EECBG will fund nonprofit and faith-based organizations to promote and

switch to sustainable, efficient energy methods. The EECBG program, therefore, aligns with framework requirement (2).

GreenPrint: Demographic Consideration

There was no mention of race or income as they relate to sustainability, the climate, or any other environmental issue in the document. The *GreenPrint* plan failed to recognize framework requirement (5).

GreenPrint: Intergenerational Impact

One of the main goals of the *GreenPrint* plan is to make county-wide shifts towards sustainability. For example, the plan acknowledges lack of natural energy resources available to the county, such as local supplies of oil, natural gases, or coal which contributes to additional costs and extrapolation. Instead, the plan vows to convert to sustainable sources of energy and reduce the need of energy imports. Similarly, the plan aims to engage with novel water efficiency models in order to sustainably extract potable water from local aquifers. For this effort, the *GreenPrint* plan meets framework requirement (4).

The *GreenPrint* establishes plans for improved health infrastructure by promoting fresh, organic food in grocery stores and farmers markets, and funding pedestrian and bike programs to reduce emissions when attempting to access these resources. Furthermore, the plan to plant more trees and cultivate native plants benefits human health as it could provide canopy on days with extreme temperatures as well as helps equilibrate toxins in the air (Alvarez et al. 2010). Additionally, green infrastructure will reduce the need for energy-sucks, such as air conditioning. General greening of the county would also accompany youth educational programs about the benefits of the greenspace and its environmental impact. Although this discussion of health is not based in climate

considerations, the attempt to reduce emissions and enable healthier lifestyles is a consideration of generational impact, thus fulfilling framework requirement (4).

GreenPrint: Infrastructural Vulnerability

The *GreenPrint* plan discusses the importance of transportation as a key facet in enacting a sustainable community. In the context of the plan, transportation expansion programs aim to reduce greenhouse gas emissions from automobiles and incentivize residents to use public transportation or other alternative modes of transit that reduce toxin release. These plans expand mass transit opportunities for residents and commuters across the county, though these proposals are not listed as contributors to mitigating the effects of climate change. Due to this lack of designation, the *GreenPrint* plan does not fulfill framework requirement (5) in the subject of transportation planning in the event of infrastructural climate vulnerability.

GreenPrint: Community-Based Partnerships

The *GreenPrint* discusses frequently the implementation of collaborative bodies between many different types of organizations, including academic, governmental, and nongovernmental. In this way, the *GreenPrint* seeks to incorporate many different stakeholders both in decision-making and in accountability structures. Often, these types of organizations could potentially work in conjunction with the *GreenPrint* plan to reduce in-house emissions through recommended efficiency shifts. Additionally, part of this plan is to enact sustainability organizations for agencies, businesses, and other types of organizations. However, this proposed type of partnership does not emphasize the importance of local voice in decision making, but rather utilizes an organization's structure and reach to pursue the program's larger goal of fewer GHG emissions. Despite this pitfall, indications of future concert between this project and community-based partnerships does allow for these

community members to have a voice and command as a stakeholder. In this way, the *GreenPrint* plan fulfills framework requirement (6).

Adaptation Action Area Analysis

AAA: Hazard Prevention

AAA addresses hazard prevention through recommendations of natural resource preservation. In order to avoid future catastrophe, AAA identifies a slough, or a “low-lying, marshy [site] that [channels] water at a leisurely place”, as a potential city-center that would “balance the needs of the people, water, and nature, creating green spaces in the neighborhood” (Urban Land Institute 2016). Situated in this natural ecosystem, the new urban area would be inherently equipped to withstand increased floods in the case of eventual elevated sea level or extreme precipitation. Additionally, the storm water could be filtrated through innate systems and retain potable water. As the slough is developed into an urban space, AAA recommends transportation and housing developments, aligned with previous statements about equity and resilience, thus reinforcing goals of environmental justice and protection. This is a long-term project that addresses an encroaching need while actively fortifying local populations and their ability to withstand a disaster. The development of a “city slough”, therefore, satisfies framework requirement (1).

AAA: Burden of Proof

Evaluating the burden of proof requirement within this policy is multifaceted. To some degree, the recommendations within the policy cite transmission of information through community-based groups to policymakers as a way for particular, local needs to be met through legislation. In this way, it is the responsibility of the community members to present their environmental struggles to those of authority in the region in order to enact mitigation and

eventually ease this burden. However, if the government follows additional recommendations, such as implementations of local leaders as decision makers, the government then adopts the burden of proof and eventually will be able to represent the needs of the people without contestation. Through this lens, framework requirement (2) is met by the AAA program.

AAA: Demographic Consideration

The Arch Creek Basin AAA addresses environmental risks as they related to community resilience, founded in social equity and social cohesion. This program’s prioritization of vulnerable communities is immediately obvious, as considerations of vulnerable populations are stated within the first few programs of this sizable policy. The Arch Creek Basin is reportedly located

The Arch Creek Basin Area, as reported in the AAA, is housing residents from diverse income backgrounds. However, it seeks to protect the most climate vulnerable: low-income residents. With high rates of poverty scattered throughout the region, this AAA identifies these areas through GIS mapping, and proposes to focus climate-related construction projects in these areas, thereby specifically investing in those communities, building resilience to hazards, and rectifying historical disadvantage and divestment.

In the case of flooding, the AAA explicitly recognizes the link between socioeconomics and experience of the disaster. The policy reads, “flooding also affects buildings, including homes, with

The Arch Creek Basin Adaptation Action Area has a chance to lead the way in putting social equity at the forefront of its climate action agenda...

disproportionate impacts to socioeconomically disadvantaged neighborhoods”, citing historic and repetitive excess damages to these areas and

subsequently recommends mitigations methods, such as drainage or pumping site renovations as well as infrastructural design to alleviate this burden from the identified vulnerable communities (Urban Land Institute 2016). Clearly cited, “The Arch Creek Basin Adaptation Action Area has a

chance to lead the way in putting social equity at the forefront of its climate action agenda” (Urban Land Institute 2016). Through the incorporation of race and income data, and recommendations to right historic wrongs, the Arch Creek Basin AAA fulfills framework requirement (3).

AAA: Intergenerational Impact

As part of AAA’s overarching goals, this program recommends a broadened outreach program. The proposal outlines the importance of social resiliency, particularly through education of community members about climate change and other critical environmental information. This recommendation is comprehensive; it considers lack of internet access, multiple language needs, and names multiple locally-based non-profit organizations that could aid in the formation of these courses and pieces of literature. This recommendation, therefore, acknowledges the need for educational programs to fortify future generations about the changing climate, thereby fulfilling framework requirement (4).

AAA: Infrastructure Vulnerability

Arch Creek Basin’s recommendation of the implementation of a commuter-rail line aims to grant access to economic opportunities found in other parts of the county that are unavailable in that region. This recommendation is meant to augment Northeastern Miami’s economic divestment and lack of wealth mobility, as well as alleviate the high-cost of car ownership for low-income earners. In addition to stimulating the job and commercial market, this AAA proposal states that addressed the need of road renovations as “the street grid also offers “limited connections and evacuation routes... making all of the population vulnerable in the face of storms and floods” (Urban Land Institute 2016). Furthermore, they suggest elimination of a “auto-dependent transportation pattern”, which in theory, aligns with Bullard (2008) finding that car-based emergency

planning led to disproportionately people of color being unable to evacuate. Additionally, this policy recommends and commits to amend and revamp current affordable housing units with the goal of alleviating environmental hazard burden through insufficient housing infrastructure. This finding is key, as such explicit phrasing and incorporation of economy, climate disasters, and transportation have not been found in any other examined climate policy. In this way, the AAA satisfies framework requirement (5).

In addition to transportation recommendations, AAA discusses the need for housing policy as it relates to climate risk and demographic vulnerability. AAA emphasizes the need for coordination between HUD and governmental agencies to “analyze and consider the patterns of segregation, disparity, and inequality” in their communities, particularly as they are influenced by racial background and poverty. As an extension, AAA recommends all future development,

including transit and housing, on higher ground. Such growth includes additional affordable housing units as

...Analyze and consider the patterns of segregation, disparity, and inequality...

well as relocation of flood-vulnerable populations into safer areas of the region. Additionally, the AAA offers a nuanced method to aiding those without cars. In the case of an emergency evacuation, AAA posits a need for investment in waterborne transportation methods that replicate local lifestyles and ensure that local inhabitants have access to safety and other material resources in the case of prolonged flooding. In coordination with EJ values, housing is therefore recognized as intrinsically linked to race and disparate experience of a climate disaster, fulfilling, again framework requirement (5).

AAA: Community-Based Partnerships

Strengthening partnerships between community organizations and policymakers is prioritized throughout the AAA program. To improve outreach, the AAA cites in name the

organizations that are working at the forefront of the listed climate issues in order to empower the voice of the people, those affected most by climate disasters. The AAA recognizes that these organizations have lasting and meaningful relationships with Arch Creek Basin residents and have been working to meet the needs of these citizens. Through this relationship, the organizations can work in conjunction with city officials to make comprehensive education programs as well as enact legislation or projects that directly reflect the communities expressed need. In acknowledgement to this extensive work, the AAA seeks to further embolden the mark these organizations have made through conscious incorporation and consideration. The AAA program meets framework element (6).

Supplementary Resolutions Analysis

The twenty-two legislations offer a variety of methods for bolstering the above-mentioned programs. Largely, these policies focus on sea level rise, and the infrastructure necessary to protect the city from devastation. Proposed projects for infrastructure include sanitation system renovations, explicit hiring of climate architecture professionals, and defective drainage site identification and construction. These proposals fulfill framework requirement (1) as they seek to diagnose an issue before the hazardous event.

Three of the policies resolve to establish ways of educating communities about the dangerous manifestations of climate change and clarify to the public the many ways in which the government is addressing and mitigating these predicted outcomes. With these recommendations, these articulations meet framework requirement (1), (2), and (4). Through these educational programs, residents have the ability to adjust personal consumption and make sustainability shifts, as well as inform future generations about the impacts of climate change. These policies alleviate the

burden of proof as the authority is advising on actual climate change issues rather than leaving the public sphere in a state of ignorance.

Qualifying the supplementary policies for framework (3) is obscured because the nature of the policy is supportive rather than assertive. However, as much of the policy reinforces the importance and enactment of the Arch Creek Basin AAA, the smaller articulations further the equity goals presented in the AAA framework. Because they support this cause, the supplementary policy, in essence, does incorporate framework requirement (3).

Limitations and Discussion

Before discussing the importance of these findings, it is critical to outline the limitations of this study. First, this study does not measure effectiveness. Although the framework seeks to identify whether or not equity is prioritized across climate policies, this study does not explore how the policies are felt by the people, the target protected audience. This research will recommend further exploration of the effectiveness of these policies although it is not within the breadth of this study to measure such effects. Second, another limitation is that this research was not conducted in Miami, and therefore does not acknowledge local understandings of climate change and its many manifestations.

Limitations considered, Miami-Dade County incorporates many aspects of this climate gap framework, with particular emphasis on hazard prevention and governmental bodies alleviating the burden of proof of affected communities. However, this study reveals that only through the Arch Basin Creek AAA, and the auxiliary resolutions specifically designed to aid the AAA, does the county address demographic vulnerability within each category of the framework. In this way, only the AAA program truly centers equitable protection from climate disaster. The Arch Creek Basin

has plans for future generations by way of comprehensive educational programs, development of environmentally-appropriate spaces, address infrastructural and transit renovations to directly benefit vulnerable populations, and vows to work with community partners to ensure long-term prioritization of local needs. This priority policy stands alone in discussion of the demographic vulnerability data, as it is supplemented by historical conceptualizations of disadvantage, and explicitly names these manifestations in the methods for creating the policy.

The *GreenPrint* plan and the CAP extensively address hazard prevention and protect future generations through shifts toward efficiency. Collectively, these plans are bolstered by supplementary policy in regards to sea level rise and educational programs that instruct on climate change. Both *GreenPrint* and the CAP have viable goals to minimize the outcomes of a changing climate, but as they are neglectful of demographic data, the policies cannot be held accountable for perpetuating goals of the environmental movement or diminishing the climate gap. Therefore, the climate gap is not a consideration of these plans and they are therefore do not actively impact historical disadvantage. Because these plans do not consider demography, the other fulfillments of my framework are diminished despite being founded in equity philosophies, as they are not explicitly designed to mitigate burden based on historic understandings of vulnerability. Without the intention of protecting those that are disadvantaged, these vulnerable populations will continue to be encumbered by the effects of climate change. The policy cannot protect those that are not named or identified. For Miami, their sustainable energy shifts are not directed to alleviate this disadvantage, as seen in the *GreenPrint* plan, and although these plans have benevolent intentions and goals, the climate gap is not centered. The *GreenPrint* and the CAP's affects may be felt by the larger Miami-Dade community, and it may ultimately benefit historically vulnerable communities, but this research critiques this plan's lack of comprehensibility and directedness. Climate policy needs to be linked

back to race and other pre-determinants of hazard experience in order to be considered as equity-focused.

The AAA program that does account for demographic and historic understandings of CJ, the climate gap has the potential to be alleviated, and environmental hazards to become equitable. The AAA program, a pilot program, signals that Miami is beginning to adopt equity-based principles though equity is not prioritized on all policy levels. However, the existence and explicit goals in the Arch Creek Basin AAA demonstrate an acute awareness for the need for justice-focused policy that elevates the importance of equitable climate protection. The fact that the *GreenPrint* and the CAP are negligent of the climate gap principles signals that although Miami-Dade County are working on creating effective and efficient policy to mitigate disaster, these plans are not equity-based and therefore do not work to protect disenfranchised groups. In this way, climate equity is a burgeoning revelation within Miami policy, and through similar structures as seen in the AAA, equity has the potential to become paramount in climate decision-making processes despite its lack of prevalence across all policies.

Recommendations

Despite Miami's diversity of approach in the realm of climate change policy, the lack of demographic vulnerability consideration diminishes its capacity to protect communities and alleviate historic burden. Although these vulnerable communities could reap the benefits of the overall policy for emission reduction and infrastructural renovations, explicit language within the priority policies and auxiliary legislation would be beneficial in adopting principles of accountability, efficiency, and effectiveness. In light of these findings, this study recommends the following in order to properly center equity in the climate field.

Recommendation 1: Expand AAA Structure

This research recommends the expansion of the AAA program. Because the AAA program stresses the importance of equity in policy making, the AAA structure has the ability to centralize topics such as disparate impact and historic burden and then spiral other decisions from those understandings. The AAA structure is the only policy in Miami that does consider demographic vulnerability through clear nominalization and therefore this study recommends that decision makers borrow its framework and apply its principles to other regions of the county. The AAA, in nature, is designed for the Arch Creek Basin. Such form of specificity could be applied to other zones with similar levels of attention to historic communities and particular geographical predispositions to climate disasters that threaten the area and its inhabitants. In this way, the policy can remain consistent with the needs of the area and provide protection accordingly.

Recommendation 2: Future Study for Effectiveness

In confluence with Recommendation 1, this study recognizes the importance of measuring effectiveness within a policy. The effectiveness of the implementation of the AAA program could not be measured in this study, and this dimension is incredibly important. This study highlights the textual evidence of equity considerations, but future studies should emphasize the people's interpretations and other lived experiences that inform the quality and capacity of such a program. Such studies could include both qualitative and quantitative measures, such as in-depth interviews or regression models. Future research could reevaluate the AAA plan, as it is a very new program, and qualify the structure as both mature and effective enough to be the model for expansion to other areas.

Recommendation 3: Adopt Equity-Based Framework

In the future, planning committees should adopt similar frameworks found in this paper that outline the need for historical retribution, based on historical racism and inequity. Frameworks, like the one this research recommends, are less open-ended than many of the other EJ/CJ platforms, but can, however, be applied to any given city or region with developing policy. In addition to these frameworks, supplementary policies should be enacted that continue correspondence between community partners or representative and policy makers, thereby empowering community members to have individual, or local-based issues addressed. Overall, the environmental movement could adopt a policy-based framework by which to enact into law at the city, or even federal level. Integration and universalization of this nature will allow for accountability and ensured environmental equity.

Recommendation 4: Further Miami-based Research

Continued study of Miami and their policy is pertinent to understanding, on a larger scale, how urban sites are increasingly vulnerable to catastrophe. Again, the AAA format enables cities to equitably evaluate the vulnerabilities of the region and account for past environmental burden and disadvantage. Miami has the potential as being a model city in the topic of climate justice, as their demographics and physical geography could be applied to many other cities or urban landscapes, just as this study built off of evaluation of Hurricane Katrina in New Orleans, Louisiana.

Conclusions

In order to rectify historical disadvantages, cities should be incorporating explicit, comprehensive, and demographic equity-based legislation when confronting the pressing issue of climate change. For critical cities such as Miami, negligence of demographic data has potentially

deadly or economically devastating effects for vulnerable communities. Miami's AAA stands exemplary in nuanced conceptualizations of the climate gap into policy. As climate change becomes increasingly doomful for cities all around the world, historic amendments are essential in protecting disadvantaged populations and preserving the integrity of the region. Without centering equity in policymaking, vulnerable and disenfranchised communities will continue to bare the weight of climate irresponsibility and suffer unjustly. The best way to ensure that climate justice is realized is through clear and intentional planning. Through the use of this study's framework, decision makers can easily prioritize justice for the future.

Appendix 1

1. Strengthen regional and local community partnerships
 - a. Implement the Southeast Florida Regional Climate Change Compact
 - b. Codify the sustainability planning process and create a formal leadership structure for *GreenPrint* implementation
 - c. Encourage all municipalities to adopt *GreenPrint*
 - d. Pursue more public-private partnerships to implement policies identifies in County plans that improve County services
2. Integrate sustainability into all leadership systems
 - a. Continue to participate in and influence sustainability policy formulation and decision-making at the national and international level through partnerships, conferences and legislation
 - b. Integrate sustainability knowledge into existing leadership programs and new elected official orientations countywide
3. Be green government role models
 - a. Integrate prioritized climate change and sustainability in local government planning, business planning and in fiscal decision making
 - b. Work with Board of Rules and Appeals and other stakeholders to maintain the Florida Energy Code and to better define and set forth responsibilities of each trade in order to improve compliance with and enforcement of the Code (Within the Florida Energy Code and 2010 Florida Statutes, Chapter 468, Part XII)
 - c. Adopt existing draft County Ordinance (per resolution R468-06) requiring water efficiently retrofits at point of home resale (prior to change ownership) and later update the ordinance to require additional retrofits focusing on energy efficiency

4. Create ongoing outreach, education, and dialogue with the community about the implications of climate change the benefits of sustainability
 - a. Develop and implement ongoing community outreach about sustainability and climate change
 - b. Estimate the Costs of Action vs Inaction and communicate implications to key decision makers

Appendix 2

Policy Name	Date Enacted	Brief Description
R-1431-08	12/16/2008	Participation in “Cool Counties” Goals and Objectives
R-1334-09	11/17/2009	Urge development of the national map
R-1388-09	12/1/2009	Resolution on Climate Change Compact
R-51-13	1/23/2013	Southeast Florida Regional Climate Compact
R-451-14	3/31/2014	Sea Level Rise, Infrastructure
R-49-15	1/21/2015	Discussions re: climate change with organizations
R-48-15	1/21/2015	Conduct a study and address potential flood damage
R-46-15	1/21/2015	Enhanced capital plan
R-266-15	3/17/2015	Supporting 2015 state and federal legislation on climate change
R-66-16	11/24/2015	Adaptation Action Areas related to sea level rise
R-903-15	12/14/2015	Sea Level Rise and zoning
R-807-16	5/23/2016	Exhibit pertaining to sea level rise
R-674-16	6/2/2016	Impact fees to address sea level rise
R-808-16	7/7/2016	Webpage related to sea level rise
R-911-16	8/9/2016	How sea level rise affects septic system
R-908-16	8/12/2016	Sanitary sewer, storm water systems, sea level rise
R-194-17	8/17/2016	Sea level rise and salt water intrusion
R-270-17	2/1/2017	Eco-lab related to sea level rise
R-269-17	2/1/2017	Feasibility of expanding sea level rise exhibit
R-396-17	3/1/2017	Programming on Miami-Dade TV

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