

**KNOWING AND RESPONDING:
LOCALIZING CLIMATE PREDICTIONS IN FLORIDA**

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KNOWING AND RESPONDING: LOCALIZING CLIMATE PREDICTIONS IN FLORIDA

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Scholars within science studies have paid a great deal of attention to climate change denial in the U.S. and have generated critical commentary for understanding larger patterns of distrust in climate science. This dissertation uses a different line of questioning and approach to instead analyze the public uptake of climate predictions in a specific place, South Florida, where scientists have garnered credibility across local governments and successfully advocated for adaptation efforts. This close qualitative study of a particularly socio-environmentally vulnerable region analyzes how actors, such as university scientists, activists, and state civil servants, come to know and respond to climate predictions at the local level. By building deep context around the uptake of predictions through explorations of local scientific practices, environmental histories, racial politics, and government structures this ethnography reveals novel social categories, epistemological artifacts, histories, and infrastructures as they emerge around processes of knowing and responding to climate predictions in Florida. Each chapter offers different analytics for unpacking these social forms, including scientist-activism, hindcasting the future, grassroots climate knowledge and expert ignorance, and infrastructures of denial. More broadly, this dissertation provides science studies scholars, anthropologists, and scholars within the environmental humanities a new approach for studying climate science as well as tools for unpacking the social forms emerging around responses to predictions developing on the ground.

BIOGRAPHICAL SKETCH

Lisa Avron earned her BA in anthropology from New College of Florida where her initial interest in critical theory and studies of race, class, and gender began. She then earned her MA in Social Anthropology from the New School of Social Research. It was at the New School that she was introduced to theories and methodologies central to science studies and environmental history. Within Cornell University's Science and Technology Studies department, she focused her study and began researching conservation science, theories of hybridity and critiques of the modernist binary separating Nature and Culture, the co-production of knowledge, and the politics of science and technology within the U.S. context more specifically. Her interest in climate politics and responses to climate predictions developed organically from her research in Florida. She was conducting a grant funded project, where she followed conservation scientists as they built and learned to use drone technologies to find invasive plant species. She published the results of that study in *Information and Culture* in 2017. While researching conservation efforts and spending time with family in Florida, she saw local governments taking climate predictions seriously, and activist's building major campaigns to educate folks living across the peninsula. She wanted to understand how people were building meaning around and clashing over climate predictions in her home state. How did people living on a peninsula so vulnerable to the effects of global warming understand, interpret, and respond to this critically important science? The concept of localizing predictions then developed out of an analysis of on the ground ethnographic fieldwork.

To Tony and Oscar.

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INTRODUCTION

This dissertation is an ethnography of how people are building knowledge through and responding to climate predictions. I chose Florida and South Florida in particular as my ethnographic fieldsite for its unique environmental and socio-economic vulnerabilities to climate impacts and for the contentious public debates about what climate predictions mean for the future of Florida's political, social, and environmental landscapes. Over years of studying conservation management, I became interested in how individuals, organizations, cities, and the state government are coming to know and respond to climate predictions.

I used qualitative research methods, such as structured interviews, participant observation, and archival research, to situate myself among different groups at the center of Florida's climate politics. Here, I began to grasp the different ways these actors are interpreting global warming forecasts and mounting ethical responses to projected climate impacts. Based on this empirical study, I found that climate predictions create openings for epistemic, political, and ethical formations at the local level, which I argue can only be understood once we look beyond the political spectacle of "belief versus denial" currently structuring debates about climate science in the United States. Studies of the public uptake of climate science often unquestioningly work with the broad categories and terms that have been largely defined by the US media and well known political figures. Researchers continue to produce myriad studies to measure levels of belief in and denial of climate science across US populations, analyzing factors, such as party affiliation, race, class, and perceptions of authority, to figure out why any particular group believes in or denies climate change.¹ Their findings determine conclusively that

¹ Sarathchandra and Haltinner, "Trust/Distrust Judgments and Perceptions of Climate Science"; Santo, "Responding to Climate Change Skepticism and the Ideological Divide"; Busch and Judick, "Climate Change—That Is Not Real!"

political ideology and party affiliation (which often intersects with race and class) are the key determinants in whether one believes in or denies human responsibility for global warming in the US, even above one's education level.² Offshoots of such studies often ask what this political polarization of trust in science might tell us about our larger political-economic moment and suggest social or psychological mechanisms for nurturing trust in science and government led mitigation and adaptation efforts.

While such studies have been critical for understanding larger patterns of the uptake of climate science, my analysis suggests that more research must be conducted at the local level so we may begin to see through qualitative study what “believers” and “deniers” do with climate predictions on the ground. Rather than working at the macro level of analysis, this dissertation works at the local level and argues for examining the emergent social forms and practices that constitute belief in or denial of climate science. Each chapter shows how climate predictions are localized, made meaningful, re-interpreted, built-on, erased, or ignored in the particular socio-environmental and political context of Florida. Localizing climate predictions is a new line of questioning and methodology that helps us understand the ways big climate science is made local and, in the process, inflected by the political, historical, and environmental contexts in which they are embedded as they become part of public and political discourse. In sum, this dissertation argues for looking more closely at the uptake of climate predictions in the U.S. context as a complex process of particular places coming to know and respond to this science.

This dissertation offers science studies scholars theories for unboxing interpretations of and responses to climate science at the local level and for studying the socio-political worlds and ethical thinking that sprout up around climate predictions in particular localities as they are made

² Tesler, “Elite Domination of Public Doubts About Climate Change (Not Evolution)”; Pew Research Center, “The Politics of Climate Change in the United States.”

by different groups. I use each chapter to situate climate science in Florida and analyze the kinds of ethical, political, and epistemic forms that scientists, activists, and government workers are building around predictions: these are scientist-activism (Chapter 1), hindcasting and climate gentrification (Chapters 2 and 3), and infrastructures of denial (Chapter 4) respectively. Each chapter advances the idea that belief in or denial of climate change is only the beginning of a much more complicated story found at the local level. Ignorance and denial manifest here as much more than information deficits in need of filling. Rather, as I show (Chapters 3 and 4), they require similarly attentive unpacking if we are to understand and disarm denial's function. Overall, this dissertation showcases how science studies is uniquely positioned to shift perceptions about climate science and solutions away from either/or binaries and toward a broader horizon with new promise for equitable and ethical futures in its close analysis of responses as they emerge on the ground.

For instance, South Florida's local governments have responded to a growing concern about climate impacts through a discourse, practice, and infrastructure of "resilience." Municipalities across the United States have taken up the "gospel of resilience" characterizing much of 21st-century conservation and sustainability practices as a means of addressing concerns about climate impacts. Resilience is a philosophy based on accepting ecological non-equilibrium in socio-environmental planning and also, in my interlocutor's terms, a managed "ability to bounce back" from natural disaster while living in environmentally risky areas. Many counties and cities in South Florida have established Resilience Officer staff positions, or civil servants in charge of educating and engaging the public on climate science while working across all sectors to research potential local climate solutions. They have become skeleton keys of governance, able to access and bring together a sprawling public-private-nonprofit nexus around adaptation.

Resilience Officers work in service of the Southeast Florida Regional Climate Change Compact, a coalition of municipalities “collaborating to reduce regional greenhouse gas emissions, implement adaptation strategies, and build climate resilience across the Southeast Florida region.” This is an infrastructure of belief in climate science that has taken up resilience discourse and hardened it with promises of a high-tech, electric and carbon-neutral economy.³ In South Florida, such promises have become synonymous with climate adaptation. As Grove, Cox, and Barnett adeptly explain, the Miami-Dade municipality now spins around a “resilience-based order,” with “sustained economic growth” as its capital priority.⁴

Throughout the year, coalitions of for-profit, non-profit, and Resilience Officers of South Florida host financial architects and urban planners from across the country at expensive conferences. The speakers at these conferences paint visions of expertly engineered, resilient future cities that will be advanced enough to weather all climate impacts and even grow their economies while overcoming environmental upheaval, all paid for with savvy financial instruments. These constantly occurring climate-focused workshops, summits, and webinars reinforce a particular definition of climate resilience: rapid, synchronous technological and scientific advancement in all sectors in the service of building the next climate-adapted Silicon Valley-esque urban landscape. Coming to believe in climate science is then often unquestioningly a matter of coming to trust and contribute to a meta-narrative of techno-scientific progress coupled with a very particular economic vision of growth that is almost utopian in character. As climate resilience makes its way into our national “sociotechnical imaginary” as a powerful framework organized efforts by conservationists, government

³ Nadasdy, “Adaptive “Co-management and the Gospel of Resilience.”

⁴ Grove et al., “Racializing Resilience”; See also Long and Rice, “From Sustainable Urbanism to Climate Urbanism.”

agencies, concerned scientists, and celebrities to convince more people to believe in climate science are then also garnering support for climate resilience as this larger political-economic project as well as a new nation-building project.⁵ In Miami, the local government reframes headline stories that speak of the “sinking city” as a lost cause and choose instead to weave a narrative optimally attractive to its tax base and potential investors: that the city will not only survive climate impacts, but will thrive beyond all expectations as a technologically advanced urban-natural landscape that has “learned to live with rising seas” and, moreover, will be able to sell the world its brand of climate resilience.

One could see how a resilience framework is important for maintaining optimism. After all, even a small amount of sea-level rise will present serious challenges to South Florida’s multi-billion dollar water management systems and increase the distance and depths of hurricane flooding to an untenable degree. Individual consumers and corporations are already changing their behaviors because of estimated futures which have not yet arrived. In a way, the climate resilience narrative anticipates the public’s anticipation of climate impacts. It’s a framing that takes control of the story, allowing the region to get ahead of any preemptive economic and environmental crises.

Yet, science studies scholarship allows us to see how such a narrative may create an over-reliance on technocratic solutions for managing risk and promote a potentially dangerous idealization of technological determinism.⁶ Scholars and climate justice activists alike have begun to critique neoliberal, technocratic visions of the future projected by resilience narratives and show that climate science can not simply enter into a place uniformly to define its future or

⁵ Jasanoff and Kim eds., *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*.

⁶ For example see Beck, *Risk Society*.

the priorities of its people. Climatologists, atmospheric modelers, and even urban planners do not lay out environmental, economic, and social planning like a set of blueprints that only requires a willing government to take action. Critical adaptation studies in particular is beginning to show that even when climate change predictions are taken seriously and real measures are implemented to build them into government and civic engagement climate science is often assimilated into political-economic systems and ideological paradigms that *resist* major change, simply returning us to perennial ethical questions central to liberal democracy: those of economic organization, social organization, and inequality.⁷ Such scholarship helps us see that resilience, belief, and denial are, in actuality, black boxes in need of opening, rather than the *telos* of an inevitable story ending with a techno-utopia.

Additionally, while the discourse of resilience frames the ways many groups talk about climate science in South Florida, my study found qualitatively different definitions of resilience on the ground. Resilience is a righteous but potentially impossible ideal for university scientists. For climate justice activists, it is a word more indicative of one's socio-economic positionality than anything else. And it is a rhetorical facade for the state, behind which its bureaucracies can carry on business as usual.

This dissertation shows the nuance of such interpretations and potential responses to climate predictions as they circulate through storied landscapes with existing political structures, socioeconomic realities, and particularly, in Sara Pritchard's phrasing, envirotechnical histories.⁸ I show that climate predictions are made knowable, meaningful, and relevant to the local level

⁷ See Gray, "Critical Adaptation Studies" and Mendez, *Climate Change from the Streets*; Koslov, "Avoiding Climate Change"; Ranganathan and Bratman "From Urban Resilience to Abolitionist Climate Justice in Washington, DC".

⁸ Pritchard, *Confluence*; Pritchard "An Envirotechnical Disaster," 219–43.

through social, political, and ethical thinking and action, rather than being purely scientific objects mired by these human dimensions.

Through close ethnographic study, this dissertation opens up questions for science studies scholars about the co-constitutive nature of knowledge and response: how a body of knowledge, like climate predictions, changes as it moves across and becomes informed by the texture of local socio-environmental particularities, how people care for information, how they construct knowledge and caring action together, and how new epistemic forms—like, new research and activism (Ch. 1), new histories (Ch. 2-3), and new knowledge infrastructures (Ch. 4)—guide the ethical practice of responding to climate change.

The research presented here shows that when climate impact predictions, like sea-level rise and hurricane intensity, are incorporated into a place, they are actually incapable of unilaterally “changing everything” on their own as Naomi Klein alludes to with her bestselling title on global warming.⁹ Rather, each chapter of this dissertation argues that an extensive epistemic, ethical, bureaucratic, and political groundwork emerges when big science’s climate predictions enter into a specific place, putting its society into a critical position of reconsidering its future, its past, and its conception of the social good in relation to its data, demanding a response. This ethnography redefines climate predictions as meaningful social objects that require local data, contextualized meaning making, and social and environmental histories if we are to understand their full political potential, and uses ethnography to understand how people are coming to know and respond to climate predictions.

⁹ Klein, *This Changes Everything*.

Climate Change Predictions as More Than Their Laboratories and Scientists

Climate predictions are composites of big, aggregated knowledge—the products of global experiments and worldwide scientific connection crisscrossing myriad disciplines. They are made of deep geologic history, as well as a perspective that sees a hundred years into the future.¹⁰ While geologists in Greenland take core samples and read rings around lake basins in upstate New York to trace trends of planetary warming and cooling over millions of years, atmospheric scientists around the world trade computer models to project data into the future, feeding their algorithms everyday with new patterns, and tweaking them to answer new questions about what our planet will be like. Paul Edwards provides science studies scholars a powerful analytic, defining climate modeling efforts over the course of his extensive studies as a “global knowledge infrastructure,” or a worldwide interdisciplinary project working to piece together an experiment where the whole Earth acts as a “control.”¹¹

Yet, from this almost omnipotent point of origination, climate predictions are still social and political.¹² Social scientists representing a variety of disciplines deftly show the social, cultural, and political practice inherent to “anticipating nature’s course” as climate models try to do, demonstrated in volumes like *The Social Life of Climate Models*.¹³ Such scholarship shows how the seemingly stable numbers and graphs made through trustworthy scientific organizations

¹⁰ Edwards, *A Vast Machine*.

¹¹ Edwards, “Control Earth”; Edwards, “Knowledge Infrastructures for the Anthropocene.”

¹² STS has proven itself to be a broad avenue for figuring out how scientists struggle at the “higher” level of knowledge production to establish shared vision and fact stability. There is texture, friction, and dynamism where groups of experts create predictions too, not only when stabilized conclusions “touch down” into local contexts. See Bowker et al., *Sorting Things Out*; Collins, *Changing Order*; Latour and Woolgar, *Laboratory Life: The Construction of Scientific Facts*; Star, *Ecologies of Knowledge: Work and Politics in Science and Technology*.

¹³ Hastrup and Skrydstrup eds., *The Social Life of Climate Change Models*.

have “much to do with conflicting politics, values, and choices,” as Pamela D. McElwee, a contributing member of the International Panel on Climate Change, has shown.¹⁴ Furthermore, no matter how imposing and authoritative predictions are made to be, their meanings then also multiply “where the rubber meets the road,” to borrow Anna Tsing’s phrasing.¹⁵ As Candis Callison demonstrates, local politics, cultures, and environments have the ability to dramatically change the meaning of predictions while employing their facticity and authority; that, in fact, “climate change must become much more than IPCC-approved fact *and* maintain fidelity to it at the same time.”¹⁶ I add here that predictions have the ability to stretch us beyond binary thinking and the mere reproduction of the status quo through this meaning making process. The case of the state of Florida and South Florida in particular demonstrates this clearly.

However, predictions are often actively depoliticized, for, ironically, political purposes. For instance, many of my interlocutors insisted on inlaying rhetoric about the transparent objectivity and authority of climate science during our conversations. The sense was, “The Science speaks for itself,” and that one either “believed” in the science or one was simply anignorant ideologue, a position that Hilgartner et al. have critiqued in a recent *Science* article. The authors analyze president Joe Biden’s presidential campaign’s characterization of his victory—that “the people have chosen science” over ignorance—as false and dangerous for public trust in science. They explain that “The ‘anti-science’ label conflates normative dissent about which values matter with epistemic dissent on matters of fact,” and recommend rebuilding a robust “politics of science” rather than relying on an authoritative and apolitical stance.¹⁷

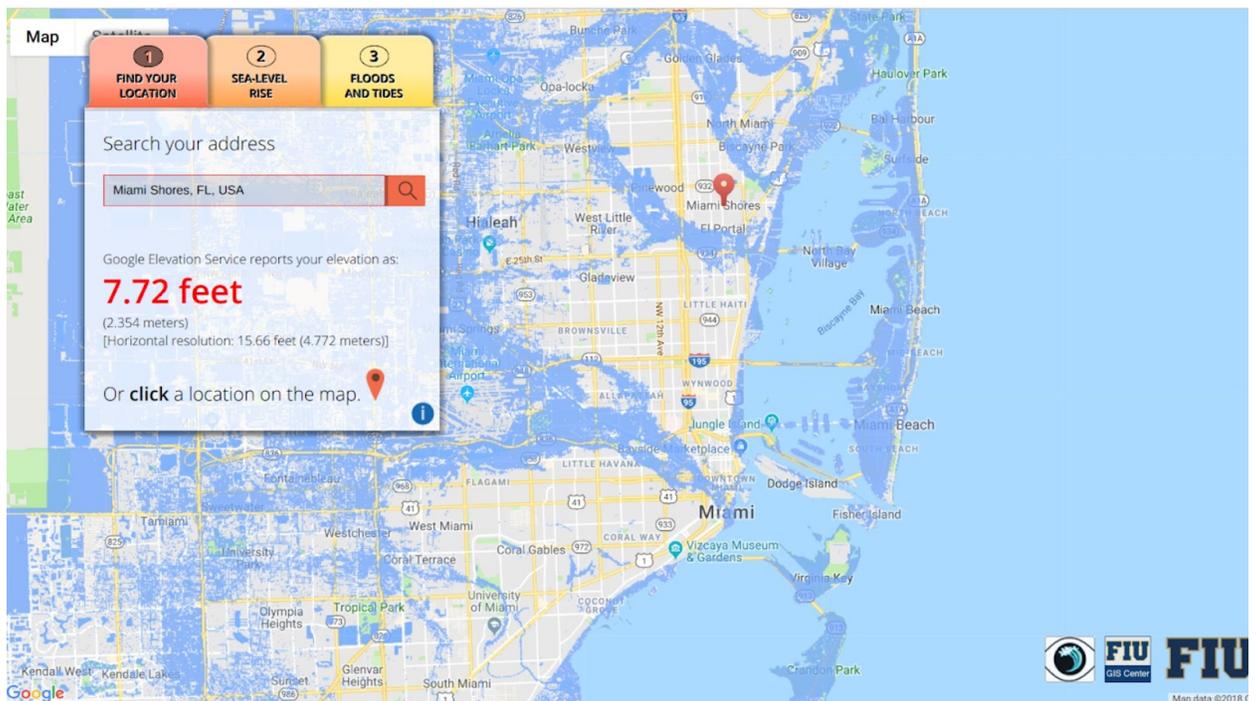
¹⁴ McElwee, “The Social Lives of Climate Reports.”

¹⁵ Tsing, *Friction*, 6.

¹⁶ Callison, *How Climate Change Comes to Matter*.

¹⁷ Hilgartner et al., “Was ‘Science’ on the Ballot?,” 893-894.

Though the authors focus mainly on COVID-19 restrictions, “the people” had also “chosen” climate science by voting for the Biden/Harris administration. The campaign therein chose to reproduce the political spectacle of “belief” versus “denial,” science versus anti-science (or ignorance), rather than plumbing the nuance of responses to climate change and the different value systems people build their responses with. This dearth of nuance makes “belief” the least common denominator—whatever actual changes it amounts or does not amount to. Belief becomes the collective goal, which can create ignorance around the kind of substantial responses climate predictions actually call for. The scientists I studied were perhaps the most guilty of slipping into the rhetoric of the belief and denial binary, but even the climate justice activists I worked with would occasionally invoke the transparency and authority of science to make political issues about “matters of fact.”¹⁸



¹⁸ Latour, “Why Has Critique Run out of Steam?,” 225-48.

Figure 0.2 Future of sea-level rise in South Florida demonstrated by Florida International University's Eye on the Rise web tool.

For instance, Figure 0.2 comes from a data visualization tool called "Eye on the Rise" created by Florida International University's Sea-Level Rise Solutions Center. The tool demonstrates one way experts at local universities are making climate change predictions accessible to the public, bringing anticipated impacts down into South Florida's hybrid landscape specifically. Unlike many sea-level rise modelers, Eye on the Rise provides its users with micro-scale measurements of incline, measured neighborhood by neighborhood, in South Florida specifically.¹⁹ I was first introduced to "Eye on the Rise" while attending an eleven week open access climate education course in 2018 called Community Leadership on the Environment, Advocacy and Resilience, or CLEAR, offered through the nonprofit organization Catalyst Miami. Through CLEAR, Catalyst provides anti-racist and anti-poverty social and environmental training across the region. The facilitators for that day projected the "Eye on the Rise" app onto their classroom screen for all of us to see, and began playing with the variables built into the clever digital modeler that allows users to toggle into the future by increasing feet of sea-level rise. "Give us an address," they asked the class. A cohort member shouted out "Brickell City Center!," which is a billion-dollar shopping and condominium complex near the shoreline where a couple of my younger, hipper cohort members lived. The facilitators typed in the location and used the toggle to slowly increase the amount of sea-level rise by one foot, two feet, three feet, sending us into the future where the blue coloring representing ocean water swallows up prime coastal real estate. We watched as the blue crawled up the coast, taking the

¹⁹ Other notable visualization projects with similar motivations include the National Oceanic Atmospheric Administration's "sea-level rise Viewer," in ongoing development since 2008 and currently accessible at coast.noaa.gov/slr, as well as National Geographic's award winning 2012 documentary *Chasing Ice*.

City Center, then downtown Miami, and then all of the beaches and the island of South Beach—the area that in total was once called the Magic City.

The creators of public education tools for South Florida like the experts behind Eye on the Rise are working to unite the public within a single storyline of climate problem to climate solution. The hope here is to combat “denial” and agnosticism espoused by the state and federal government through 1) science literacy, which constructs the problematic as an information deficit (i.e. people do not know or do not have the means to understand science); and 2) claiming science is apolitical and speaks for itself. These are both employed as the primary means of taking on the public/private “merchants of doubt” working to fracture public consensus around predictions.²⁰ The supposed inherent apolitical nature of sea-level rise predictions served as a cohesive strand that looped through a few different field sites of mine in South Florida. From professors at local universities, to state bureaucrats, to nonprofits—I was told that politics has nothing to do with and *should* have nothing to do with the numbers representing sea-level rise and the technical solutions needed to mitigate and also adapt to the damage already done.

For example, an employee within the Florida Department of Environmental Protection (the organization at the center of Ch. 4) working as a key hinge on state level adaptation efforts shared a “personal opinion” about climate politics during our interview, saying, “Think what you may [about] Al Gore, but I think he was the worst thing that ever happened to climate change...Because of political polarization right there, it became associated with the Democratic Party and so Republicans...by definition had to turn away from it.” Another state employee also shared with me, “To me, [climate change] wasn't a political thing until [Al Gore] made it a political thing ...and it should never have been.” We can compare these comments to the

²⁰ Oreskes and Conway, *Merchants of Doubt*.

nonprofit Climate Leadership, Education, and Outreach (CLEO) Institute’s 2018-2019 public outreach campaign which used a similar framework as Eye on the Rise and the civil servants cited above.²¹ CLEO creates educational forums and ad campaigns meant specifically to reach across the bipartisan aisle—to convince all South Floridians of prediction’s legitimacy through climate science training, even allowing them to earn a certification as a CLEO Climate Leader. As Natalia Ortiz, director of development at CLEO, explained during our interview, climate change predictions “shouldn’t be controversial if it’s presented in the right way, you know, because for so long Republicans have kind of politicized it as an economic issue.” She continued, lamenting that, “it’s just because at the end of the day, these politicians, they’re not scientists, you know, they don’t have scientific backgrounds” and solving climate problems is “really a matter of getting everybody on board regardless of party,” or of drawing people together around the facts and their experts.

FIU’s 2018 “Journalists and Editors Workshop on Climate Change in the Americas” created an uproar among many of my interlocutors for hosting a debate between a top Heritage Foundation lawyer, oil lobbyist, and science denialist, James Taylor, and a Citizens’ Climate Lobby representative, Greg Hamra. It was meant to be a workshop for students of journalism to learn how to report on climate change as an issue of public concern, but became a platform for promoting “false balance.”²² Frank Mora, former deputy assistant secretary of defense for the Western Hemisphere under the Obama administration (2009-2013) and current professor of

²¹ CLEO has many campaigns and initiatives that align specifically with socio-environmental justice issues if it’s overall focus is the spread of climate education. They are a trusted and welcome organization among the social justice organizations I worked with, and in fact trained many of the climate justice activists interviewed for this dissertation.

²² Jerry Iannelli, “FIU to Host Notorious Climate-Change Denier at Global Warming Conference Next Week,” *Miami New Times*, March 21, 2018, <https://www.miaminewtimes.com/news/fiu-hosts-climate-change-denier-james-taylor-10189772>.

International Affairs at FIU, moderated the debate and welcomed James Taylor's presence, though he himself "believes" in climate science. He described the logic behind hosting the debate during our interview, telling me that facts should speak for themselves: that they are our most powerful political tools, and all facts should be reported on equally, otherwise "we" (meaning partisan liberals) are being "intolerant" to other ideas, risking alienation while corrupting our democratic ideals. "[We don't just say] oh, okay, that's your opinion," Mora told me, "No, we rebutted with facts. That's what you do. Rather than saying, 'You're an idiot. You don't know what you're talking about' ...My objective [welcoming James Taylor to the event] was not to say to the journalist, when you do a story, you have to give both views. No, your responsibility is to give the facts...[But also, to say] 'Oh, their facts are wrong. Therefore I'm going to ignore them,' is, to me, bad journalism. And it worries me as someone from the left that we've become intolerant on some of these issues." The correct facts will come out if given enough of the stage and if we remain impartial and apolitical. When I suggested reading the debate with an eye for power dynamics—that giving someone known to manipulate data openly for their own economic class interests a microphone and an equivalent position on stage to a person genuinely representing science to the best of their abilities he respectfully disagreed. "I couldn't disagree with that more," he told me, "that is just to be scared," and leads to further bipartisan polarization. Never mind that billionaire oil interests created the Heritage Foundation as a front to subvert democracy and place policy control directly in the hands of a very small minority through the circulation of misinformation. Mora misconstrues "balance" for accuracy, reaffirming the fallacy that climate change is somehow like all other matters of science and should be devoid of values and political decision making.²³

²³ Candis Callsion shows how journalists have actually been combatting this kind of simplistic take on "balanced journalism" since 2003, telling us, "Climate change as a story, according to scholars, scientists, and journalists, has suffered mightily in the past from these problems of unnecessarily balancing points of

I was even confronted with the idea of “depoliticizing” climate change at my home institution during my research when a white, cis, male first year student in the Atmospheric Sciences department penned an opinion piece for the *The Cornell Daily Sun* titled, “The Climate March to Nowhere.”²⁴ Herein, the student states his concerns about the “social justice demands” crafted by his fellow students for the 2019 Climate March across campus, which he claims infiltrated what should have been a purely scientific message. “While increased understanding of indigenous history and shared governance are both laudable goals,” the student tells us, “neither of them are related in any way to keeping carbon dioxide out of the atmosphere.” He continues saying, “Furthermore, by tying climate action to a broader range of progressive social justice issues, organizers of the march are continuing down the dangerous road of making climate action a partisan issue.”

What are these underlying concerns with “politicization” of climate change? The above comments suggest that when we process stabilized climate science and predictions through the optic of socio-economic issues, or any ethical framework informing how we organize society, we threaten this science’s ability both to employ that useful omnipotent authority which has the power to change minds and to simply institute technical solutions for taking “carbon dioxide out of the atmosphere.” The information deficit model coupled with the apolitical approach have proven to be useful strategies, producing some gains towards adaptation (if not mitigation) efforts in Florida. They’ve created a strong, united front of “belief” in South Florida with concrete solutions that pressure waffling politicians, like Rick Scott and Marco Rubio who have

view and reporters being dropped into climate change with little or no background on the science and/or debates”; Callison, *How Climate Change Comes to Matter*, 82.

²⁴ Aidan Mahoney, “The Climate March to Nowhere,” *The Cornell Daily Sun*, December 10, 2019, <https://cornellsun.com/2019/12/10/guest-room-the-climate-march-to-nowhere/>.

felt at least some pressure from the coordinated efforts of South Florida’s Compact leaders outshining the senators on a global stage. This united coalition of grassroots, nonprofit, and city and county actors (a majority of whom would identify as Democrat or leftist) is especially important within Florida, whose Republican state leaders built a bureaucracy of science denialism into its branch of environmental protection (Chapter 4).

However, this dissertation most broadly demonstrates that efforts to “depoliticize” climate science and build up trust in its representative experts simplify a complicated social, political, and ethical issue and turn it into a problem about a one-sided lack of information and moral fortitude. When “belief” in climate science and trust in scientific authority is the least common denominator, climate change can be reframed as an issue for experts to resolve within a technocracy. In this framing, engineers only need to add concrete infrastructure and atmospheric scientists only need to figure out how to sequester carbon out of the air so that the business as usual may continue. Those against “politicization” want science to work like politics and government without actually being political or governmental.

The technocratic reframing also ignores (literally, to produce ignorance about) the deep wound climate predictions have dealt to our fundamental political-economic structure as well as the justifications of endless growth that grease its wheels. Such “technical adjustments,” as Gökçe Günel describes, “allow humans to extend their beliefs and perspectives into the future without requiring them to ask new moral and ethical questions and without developing new virtues.”²⁵ Sheila Jasanoff’s work on “civic epistemologies” and the ethics of technology hammer home this point: that societies are neither empty receptacles simply in need of more information nor passive spaces requiring scientific tweaks to manage its occasional crises.²⁶ “The idea that

²⁵ Günel, *Spaceship in the Desert*.

²⁶ Jasanoff, *Designs on Nature*; Jasanoff, *The Ethics of Invention: Technology and the Human Future*.

science comes on a white horse,” she tells us, “and that as soon as a problem is detected you have a scientific solution, that’s a mirage.”²⁷ Attempts to shelter scientific authority or wield it as a cudgel within debates about climate change both deny “the communal life of facts”—or how people build meaning with science at the local level, imbuing information with values and making knowledge applicable to context—and tends to limit the kinds of conversations we can have about a fundamentally political topic to the rhetoric of technical adjustments and technocratic management. It may even lead to a reactionary kind of positivism that could impede climate solutions. More recent studies, such as Mayanna Lahsen and Esther Turnhout (2021), demonstrate that sociality does not interlope on the production of objective scientific knowledge. Rather, it is always present, such as in the funding hierarchies currently structuring global climate science. Lahsen and Turnhout have found potentially detrimental hierarchies among the global climate science community that favor atmospheric and earth sciences above other kinds of socially-focused research that could lead more directly to mitigation policy.²⁸ “Belief” and technocratic solutions only get us so far, and at times strangely reflects the imperatives, if not the content, of “denial”: to limit what counts as climate knowledge and how we should respond.

I contend that we need to begin recognizing and analyzing the new knowledge, histories, and social, political, and ethical forms growing around and adding new meaning to climate science instead of attempting to disassociate science from politics (which is a fallacy). Each chapter of this dissertation shows that science studies is particularly well suited for analyzing climate knowledge as something that emerges co-constitutively with political, social, and ethical

²⁷ Nawal Arjini, “Science Will Not Come on a White Horse With a Solution,” April 6, 2020, <https://www.thenation.com/article/society/sheila-jasanoff-interview-coronavirus/>.

²⁸ Lahsen and Turnhout, “How Norms, Needs, and Power in Science Obstruct Transformations Towards Sustainability.”

forms and that adaptation efforts need to begin considering these human dimensions to build effective and thorough responses.

Situating Predictions: South Florida as a Hybrid Landscape

Science studies, anthropology, and environmental history each offer helpful heuristics for thinking about how people and nature build each other. “Hybridity,” “co-constitution,” and “cyborgs” emerged from social studies of science and philosophy of science, their authors demonstrating the actual force of “non-human” actants in Western knowledge networks, sociality, and politics.²⁹ Similarly, anthropologists (and environmental anthropologists in particular) use discourses on “place,” “placemaking,” and “ecologies” to understand how culture, economies, ethics, and power dynamics among people emerge and change with environments.³⁰ Environmental historians introduced “hybrid landscapes,” which helps us rethink natural entities as a force in history and “Nature” as a powerful construct, to see beyond our environment’s taken for granted status as a mere backdrop for human action.³¹ These disciplines then directly intersect around “envirotechnical” issues and “ontological turns”; each employing analytical frameworks for centering relationships among humans, material culture, natural beings, and landscapes.³² Alloying these discourses here, we can come to see climate changing Florida as multidimensional, as brought into view by scientific practice and representational forms like

²⁹ Latour, *Science in Action*; Latour, *We Have Never Been Modern*; Haraway, *Simians, Cyborgs, and Women*; Haraway, *When Species Meet*; Myers, *Rendering Life Molecular*.

³⁰ Geertz, *Agricultural Involution*; Rappaport, *Pigs for the Ancestor*; Basso, *Wisdom Sits in Places*.

³¹ Cronon, ed., *Uncommon Ground*; Fiege, *Irrigated Eden*; Fiege, *The Republic of Nature*; Cronon, *Nature’s Metropolis*; White, *The Organic Machine*; Sutter, *Let Us Now Praise Famous Gullies*.

³² Jørgensen eds., *New Natures*; Pritchard, “An Envirotechnical Disaster,” 219-43; Raffles, *Insectopedia*; Choy, *Ecologies of Comparison*; Tsing, *The Mushroom at the End of the World*; Petryna, “Wildfires at the Edges of Science.”

predictions and maps, by environmental forces like geology, heat, and moving water, and by political landscapes like policies of belief or denial and climate justice movements. Climate predictions become complex actants themselves in a web of global-local knowledge production circulating across an entwined geological, social, and political-economic landscape.³³

Florida's Geological History as Prediction

Florida is a peninsula jutting into the Caribbean sea, rounding out the Gulf of Mexico to the west and embanking the Atlantic to the east. Its southern tip—mainly Miami-Dade and Broward counties—is both this study's regional focus and the landscape of my adolescence. Teachers often tacked large glossy maps illustrating South Florida's geology and diverse ecology to the walls of my grade school classrooms. I encountered these maps once again in my fieldwork. Their bioluminescent-like tones of neon green and yellow still remind me of the mahi-mahi fish caught off the peninsula's coast. The varying colors and their degrees of brightness and dullness on these maps represent topographically significant dips and swells in South Florida's geological formation. The surface of the long necked landmass developed its own unique fingerprint of ridges and grooves seen today over eras and epochs by the force of the planet's shifting climatic atmosphere over time. What we know as Florida today has, therefore, always been subject to the warming and cooling, the melting and freezing of Northern and Southern Arctic landmasses thousands of miles away. Whether or not the peninsula's terrestrial landscape was three times its current size, like in the Pliocene and Pleistocene epochs, or entirely underwater, like in the early Holocene, depended on the expansion and contraction of Arctic ice,

³³ For key discussions on globalization and meeting points of the global and local See Appadurai, *Modernity At Large* and Tsing, *Friction*.

that in turn were determined by the levels of carbon cycled up into the earth's atmosphere.³⁴ More carbon meant more warmth, less ice, higher sea level, less landmass.

The slightly higher and lower elevations of South Florida, its ridges, coastal ecologies, and beaches are a product of the Atlantic Coastal Ridge's development. Perched on an underwater plateau wrought from volcanic eruption, jagged coral sprouting in dizzying chromatics stretched east and west to create a massive shallow water ecology. This was a shoal of planetarily significant proportions. Coral communities lived and died over the course of millions of years atop the plateau between the Pleistocene and Holocene eras, serving as the homes and graveyards for fish, eel, and innumerable quantities of shoal life whose remains would eventually calcify into networks of white limestone rock formations—a soft, chalky mixture of *bio* and *geo*, time and space. As sea levels rose and fell, the ebb and flow rushing of ocean water at the end of the earth's last ice age carved out inlets in this soft rock and created wide, if stubby, plateaus of around 15 to 17 feet high, thus also creating lower ground (coastline and valleys) at around 4 to 6 feet high.

³⁴ Hine, *Geologic History of Florida*.

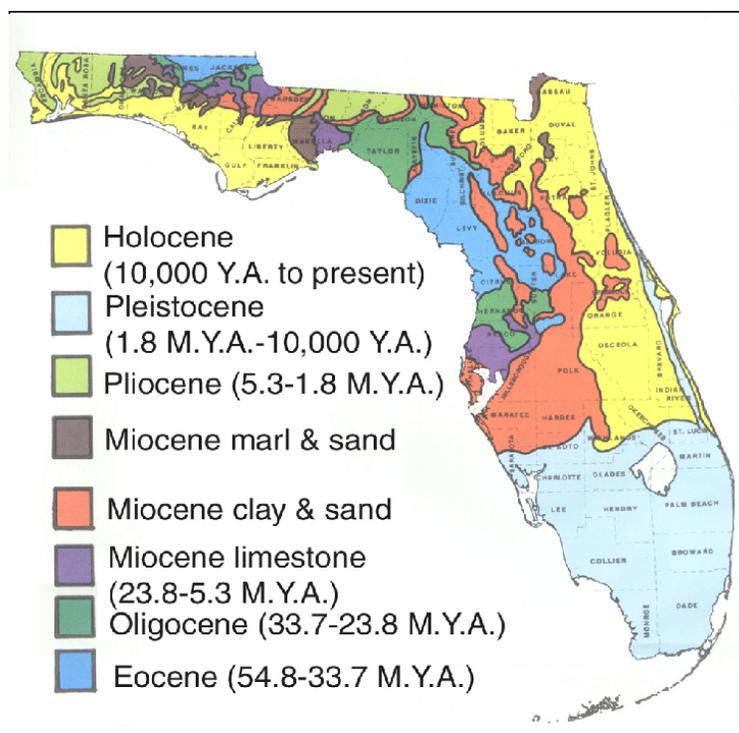


Figure 0.1. Florida Bedrock Layers. Reproduced from FLGS Map Series No. 112. Credits: U.S.G.S.³⁵

This is the simpler, linear narrative version of a much more complex history that I learned from geologists during my fieldwork. When sampled and mapped, our continent's geology looks less like the clean-cut stratigraphy that I've described above and more like different colored playdough smashed together, with each color representing a different period of time and a different quality of rock, demonstrated in Figure 0.1.

However, this simplified narrative at least gets to a general understanding of why Florida's physical environment makes the peninsula so vulnerable to climate impacts, specifically sea-level rise and intensified hurricanes. Like some of its neighbors along the Atlantic Coastal Plain (including portions of the Carolinas, Georgia, Maryland, etc.), the peninsula has only ever been terrestrial for relatively (geologically speaking) short periods of

³⁵ Allen and Main, "Florida's Geological History."

time, and has always been subject to heated carbonic atmospheres and its corollary, melted Arctic ice. Its constitution as a peninsula is really a temporary phenomenon, a window of time, and a brief one at that.

Its unique geological and ecological make up—soft limestone below, Everglades swamp above, and beaches all around—make potential solutions for halting inundation or “accommodating the water,” as is often said in local government, from current warming over the next 30 years elusive and, over the next 100 years, practically impossible barring some radical change. Below the asphalt and deteriorated peat soil lays porous limestone, frequently described in conferences, climate education courses, and public hearings across Florida as the geological equivalent to “Swiss cheese.” Water passes right through it. Below this first layer are gigantic freshwater aquifers, further evidence of how limestone relents to water’s force, easily carved out and manipulated. The Biscayne aquifer beneath South Florida spans 4,000 square miles and supplies around seven million people with freshwater. When sea-levels rise, ocean waters will seep into these aquifers and drive freshwater up from underground, polluting freshwater sources while flooding the land, simultaneously as ocean water crawls inland from the coasts to consume the peninsula’s silhouette.

I dedicate Chapter 1 to unpacking the actual complexity of making local climate change predictions, analyzing how different knowledge networks and goals create different kinds of climate change predictions for South Florida. Suffice it to say here, the Southeast Florida Climate Compact’s 2019 predictions, which combine data from the National Oceanic and Atmospheric Administration (NOAA) and the IPCC, estimate a median increase of at least one foot by 2030, close to two feet of sea-level rise by 2040, and up to four and a half feet by 2070.³⁶

³⁶ “The Compact Releases Its 3rd Regionally Unified Sea-level Rise Projection,” *Southeast Florida Regional Climate Compact*, December 19, 2019,

Moreover, this 5-inch increase from the Compact's last update in 2015 may yet be a conservative estimate. Experts involved in local climate politics, and geologists in particular, claim that the rapidity of feedback loops from ice melting and degradation across Arctic landscapes are not being fully accounted for in these numbers. Some propose higher numbers, like 3 feet by 2050 and 6 feet by 2100.

Either way, the few inches of ocean rising already occurring has proven to flood streets and halt business as usual, as seen in the city of Miami Beach today, which in 2018 spent over \$500 million installing storm water drainage pumps and raising roads, with questionable effectiveness. The U.S. Army Corps of Engineers, a longstanding force across the peninsula's hybrid landscape, is also currently seeking public commentary on a \$4.6 billion project to install seawalls and canals. Yet, NOAA, the National Aeronautics and Space Association (NASA), and university scientists analyzing increased hurricane intensities in Florida predict storms so strong experts must return to the drawing board to create new categories. While increased wind speed is a major factor shaping impact during landfall, on its own a hurricane's intense storm surge rushes salty ocean water on land to flood two-story buildings and corrode infrastructure and cars.

Since at least 2010, Dutch companies have been marketing themselves as experts in water management to local governments in South Florida, the Netherlands having successfully controlled its own precarious position below sea-level with dykes and dams for hundreds of years, producing a legacy of knowledgeable civil engineers.³⁷ Yet, while companies, such as Aracdis, have established contracts with South Florida's Water Management Districts to

<https://southeastfloridaclimatecompact.org/announcements/the-compact-releases-its-3rd-regionally-unified-sea-level-rise-projection/>.

³⁷ Ven, G. P. van de, *Man-Made Lowlands*; Reuss, "Learning from the Dutch"; Mostert, "Water and National Identity in the Netherlands."

reengineer some crucial interior infrastructures, all parties have an open understanding that the region's particular environment makes technical solutions like seawalls and dykes temporary. In short, currently there are no current long-term technical solutions for predicted sea-level rise because of the peninsula's unique geological formation. Water will be coming from above, below, the sides, and from the Everglades within.

I found this fact to be an open secret across all parties in Florida's climate politics—among local resilience officers, engineers, state civil servants, developers, and climate justice activists alike. For example, I interviewed a prominent (upper middle-class, Cuban-Colombian) local activist and lifelong Floridian who was describing her passion for climate education campaigns. She was convinced that South Florida was on the cusp of switching over completely to a solar grid, raising roads in all vulnerable neighborhoods, and building more just and comprehensive emergency facilities. However, towards the end of our conversation, in a moment of quiet honesty, she stated, “I'm seriously considering buying a property in Colorado. Selling my house when my kids graduate and buying a property [in] Colorado. Because I'm not going to wait until I'm 60 or 70 years old to realize my property's worth nothing.” Living with climate change predictions in South Florida means working across different registers, including hope, despair, trust and distrust (in scientific authority, in public action, and in policy reform), often within the span of a single conversation.

A Landscape of Racial and Economic Disparities

South Florida's environment is not only constituted by these geographically and geologically expansive forces, though. After all, political ecologists and environmental historians have been particularly apt at redefining “vulnerability” as very much a matter of human control,

despite the obfuscating nomenclature “natural disaster.”³⁸ Of course, climate change itself is the foremost (tragic) example of how binaries that split Humans from Nature have failed us. Therefore, it is important to understand how South Florida’s twentieth and twenty-first century political-economic formation has emerged alongside its geological vulnerabilities, as a hybrid-landscape or naturalcultural phenomenon.³⁹ Features unique to this peninsula—its geology, ecologies, and beaches—emerge as actors within Florida’s social, political, and economic history. Further, an account of the state’s population history also helps us begin to ask *who* has been and continues to be vulnerable across this climate-changing landscape?

Florida is a border state without terrestrial borders. Its modern demographic history is defined by the movement and change brought by oceanic trade, brutal colonialism, slavery, and imperial war. Even prior to its ratification as a state in 1845, the peninsula served as an international oceanic portal, famous for “opening up” what became Latin America and the Caribbean islands to the United States and vice versa. Centuries after Spanish and then British colonization, a variety of (what we could call now) multi-national, multi-racial settler populations farmed in lush peat soil to grow strawberries, oranges, and sugar cane, played and fished in ocean waters, crossed the peninsula’s straits into the Caribbean to move goods, and built neighborhoods of shotgun shacks along side banyan trees that are now the size of houses themselves. However, wealthy white elites simultaneously established large plantations across the state and enslaved hundreds of black people for monocrop agriculture, predominantly cotton, up to the Civil War (1861-1865) and subsequent Reconstruction period (1865-1877).⁴⁰ White

³⁸ See Steinberg, *Acts of God* and Klinenberg, *Heat Wave*; See Kroll-Smith et al., *Left to Chance*; Peluso, and Watts eds., *Violent Environments*.

³⁹ Haraway, *When Species Meet*.

⁴⁰As an undergrad researching a plantation close to my college, I became very familiar with how popular local histories whitewash plantation labor, ignoring the archaeological significance of Black enslaved

settlers also pursued major agricultural feats, sending sweet fruits to the rest of the country. Florida's rugged swamps in the northwest were and are still home to Seminole tribes who fought against US territorialization (having to this day never ceded).⁴¹ The seemingly unnavigable marshlands also served significantly as a home for black folks escaping enslavement, who carved out lives for themselves in the midst of wars, and held complicated allegiances among First Nations people.⁴²

Beyond the Reconstruction period, the state of Florida continued to actively organize its political economy and society around institutional and cultural white supremacy as it entered into the twentieth-century. This economy was built around agriculture, but became equally dependent upon the peninsula's endless soft sandy beaches. South Florida billed itself to white domestic tourists as the "Magic City," or a reclaimed beach environment tailored with all the accoutrements suiting wealthy and middle-class tastes (detailed extensively in Chapter 2). Three main racialized categories emerged that would serve this Jim Crow Magic City ideal—white, Black, and "Hispanic" or "Latino." White and Black skinned folks (regardless of nationality or class status) were designated polar opposites, while many lighter-skinned Latinx⁴³ populations

folks dwellings, praising slave owners as "good masters," and referring to plantation owning as a "way of life" or culture. See "Plantation Culture: Land and Labor in Florida History," *Florida Memory*, https://www.floridamemory.com/learn/exhibits/photo_exhibits/plantations/plantations3.php.

⁴¹ See Jessica Cattilino's work for a contemporary analysis of enduring Seminole communities in South Florida in Cattilino, *High Stakes*.

⁴² Howard, "Looking For Angola".

⁴³ #Latinidadiscanceled is a recent movement sparked by young Latinx people looking to create categories of decolonial identity more inclusive to Black Latinx experiences. According to scholars, like Tanya K. Hernández, and cultural commentators, like Janel Martinex, Latinidad derives from the Blanqueamiento movement (i.e. the top-down efforts of countries like Argentina and Brazil to literally whiten their predominantly Black populations of African ancestry) and limits inclusion into the Latin identity to light skinned, straight haired people. Latinx rather signifies the shared experience of oppression, survival, and culture of those who call places south of the U.S. their native homes. It is an inclusive, anti-racist category that attempts to redress histories of anti-blackness and reference extant structural oppression. As

were treated with ambivalence, exemplified by the general acceptance of middle-class and elite Cubans who became a stable presence in Floridian society just prior to and during Castro's revolution (1959-1962).⁴⁴ While many white folks in the early to mid-twentieth-century chose to live among "assimilated" or "assimilable" "white Hispanics," as they are now often called, the red line of segregation was drawn decisively between groups considered Black and white.⁴⁵ Indeed, well into the 1930s Black people would be found hung from trees by white mobs as far south as the beach town of Fort Lauderdale, as Florida held the highest per capita lynching rate of any other state for the years between 1877 and 1950. Black communities were pushed inward onto a geological ridge higher up and away from the coast. Until the 1970s, Black people could

such, I choose to use Latinx when referring to groups of people who identify with places, such as South America, Latin America, Mexico, and the Caribbean living in Florida today.

⁴⁴ Other lower class Cubans entering in the 1980s through the Mariel boatlift around the time of Haitian immigration would not find their circumstances as inviting. See Portes et al., "Unwelcome Immigrants," 493-514.

⁴⁵ "Lynching in America: Confronting the Legacy of Racial Terror," *Equal Justice Initiative*, <https://lynchinginamerica.eji.org/report/>; More contemporary characterizations of twentieth-century South Florida tend to paint with a broad brush with movies, tourist brochures, and news media today especially forefront the decades of Cuban immigration beginning in the 1950s and spanning the east and west coasts—from Miami to Tampa—which have, of course, fundamentally transformed South Florida's culture and politics. Major immigration of Cuban exiles to Florida is usually marked as movements between 1959 - 1990. For a review of Cuban immigration in South Florida, its origins and politics, See Garcia, *Havana* and Triay, *The Mariel Boatlift*. The U.S. census tends to mirror national presidential campaigns in their more or less hamfisted attempts to categorize the swing state in terms of broad fixed racial identities today. Through these institutions groups are marked as white, Black, and Asian, with Latinx folks grouped racially into the "white" category to be later broken up into ethnic classifications of Hispanic white or non-Hispanic white. Using the 2010 national census, "Miami Matters," a Health Council of South Florida initiative, counts Latinx folks as racially white, claiming that 75.6% of the county's current population is white and 16.7% are Black. The initiative then claims that 71% of "racial whites" are considered ethnically Hispanic/Latino, with 29% being white only. The nuance within each of these categories, of deeply rooted Native, African American, Puerto Rican, Afro-Caribbean (Haitian, Bermudan, and Dominican), South American (Venezualian, Brazilian, and Coloubian), Central American (Nicaraguan, Honduran, and Salvadorian), and Jewish populations remain lesser known to most living north of Orlando, though these groups have been equally constitutive of politics and culture across the region and make up major enclaves within city neighborhoods. See "2020 Demographics," *Miami matters.org*, <http://www.miamidadematters.org/demographicdata>.

work in service positions to propel the Magic City beach paradise, but were legally and then culturally disallowed access to this segregated environment (Ch. 2).

Tourism is still Florida's greatest source of income, generating more than \$40 billion in revenue a year—within a state with a residential population of 21.4 million. Visitors concentrate around theme parks in central Florida, but they are drawn specifically to the peninsula's beaches. The engineering of Florida's beach spaces as they are known today took massive amounts of labor beginning in the early twentieth-century. From architecturally innovative buildings and high-tech entertainment complexes to federal and state beach reclamation, sanding, and re-sanding efforts—coastlines had to be sculpted into effortless paradise. Helen Rozwadowski's analysis of the Northeast's burgeoning love for beachgoing in the mid-nineteenth century mirrors Florida's later twentieth-century economic reorientation: “the new recreational activities that brought wealthy people to the seashore were, to others, sources of employment and the foundation for a new coastal economy based on second homes, an extension of the social season, and later, middle-and working-class tourism.”⁴⁶ Tourists today from across the socio-economic spectrum still seek out that “sense of the sublime that arose from direct experience of the sea” while less privileged folks labor in blue collar positions to maintain that sublime experience often are mistakenly taken for granted as “natural.”⁴⁷ Black and brown folks from inland neighborhoods like Little Haiti, Little Havana, and Liberty City *are* the tourist and hospitality industry in South Florida, constituting a blanket majority of Local Union 355's 300,000 person membership.

⁴⁶ Rozwadowski, "Playing By—and On and Under—the Sea," 168.

⁴⁷ *Ibid.*, 167.

Florida's history of racialized inequality echoes into its contemporary radical economic inequality.⁴⁸ Statistics in 2014, 2016, and 2019 rendered from census data rank Miami as one of the most unequal cities, if not the most unequal city, in the United States.⁴⁹ While the region in many ways follows the country's overall 40 year trend towards five and sevenfold gains for the ultra wealthy and negative wealth (debt) for the bottom 20%, South Florida's racialized Black and non-white Latinx communities have clearly been hit hardest by the trickle-down economics.⁵⁰ The number of total jobs has increased in Miami-Dade county since 2007, but these tend to be marginal service positions. In actuality, wages are decreasing while positions are offering less in terms of supporting workers' general livelihoods (childcare, healthcare, travel expenses, etc.).⁵¹ A recent joint university study titled "The Color of Wealth in Miami" sharpens broader census data to demonstrate how the twentieth-century Jim Crow political economy echoes into the twenty-first century. Tellingly, the median household aggregate wealth (including

⁴⁸ It is important to note here that the racial nomenclature used within this dissertation—mainly white and Black—are heuristics for examining facets of South Florida's twentieth and twentieth-century anti-Black, pro-market political-economy specifically. Unlike the census though, neither "white" or "Black" here refers to an essentialist phenotypical characterization but rather to a system of racializing capitalism, where market forces, local politics, and culture make and remake what it means to be white or Black in South Florida in the twentieth and twenty-first century periods. I often use qualifiers in this text that help me continually refer back to structural racial coding when identifying white or Black actors, allowing me to unpack the patterns of racialization that produced and continue to reproduce a broader system of white capitalist supremacy. This is, of course, only one of many stories of racialization that could be told of South Florida. But it is one particularly apt for the current moment because of the way contemporary hegemonic visions being developed for Florida's climate changed future hope to reproduce a status quo with "the market" at the center and issues of socio economic injustice often (though not always) at the periphery.

⁴⁹ Heather Long, "America's 10 Most Unequal Cities." *CNN Business*, December 14, 2014, <https://money.cnn.com/2014/12/14/news/economy/america-inequality-10-worst-cities/>; Ponczek and Lu, "The 10 Most Unequal Cities in America."

⁵⁰ "Nine Charts about Wealth Inequality in America (Updated)," The Urban Institute, <http://urbn.is/wealthcharts>; Shambaugh, Kriston McIntosh, Emily Moss, Ryan Nunn, and Jay, "Examining the Black-White Wealth Gap," *Brookings Institute*, February 27, 2020, <https://www.brookings.edu/blog/up-front/2020/02/27/examining-the-black-white-wealth-gap/>.

⁵¹ Ponczek and Lu, "The 10 Most Unequal Cities in America."

assets, resources, savings, and debt) among whites stands at \$107,000, while Black and brown folks hold only an estimated \$3,700 to \$1,200 in aggregate wealth, with skin color still acting in Miami as a greater indicator of one's socioeconomic position than one's ancestral heritage.

The climate justice activists I've studied forefront a sociological question that essentially reframes climate change impacts as natural-cultural disasters—as fundamentally ethico-political—by asking, “Who has the ability to rebound in a crisis? To evacuate or even pick up and move to another state?” Responses to the 2008 recession may provide an indication. The joint study cited above reports a massively disproportionate decline in asset values and higher rates of foreclosure on homes for Blacks and Latinxs,” in Miami in the years following the Recession. Such disproportionate abilities to respond to crisis is a product of an intergenerational wealth theft experienced by Black and brown (or “non-white Hispanic”) communities in South Florida. Understanding this wealth gap requires looking beyond immediate income inequalities and instead considers a century's worth of discriminatory housing practices, declined or high interest bank loan offers, unequal employment opportunities, disproportionate criminalization, brutalizing policing, desperately unequal and segregated public schooling, inadequate access to natural environments, and more.

To wit, South Florida is an enmeshment of geology, racialized political economy, constructed beaches, immense wealth, and poverty.⁵² Climate change predictions are touching down in this enmeshed landscape and applying pressure to various political factors to respond, pushing them to reflect on this landscape's future and their place in it. To see things this way means understanding climate change predictions as fundamentally political and ethical.

Literature Overview

⁵² For a discussion of “entanglements” in the Florida Everglades see Ogden, *Swamplife*.

I build my theoretical scaffolding from discourses on the social construction of knowledge and science, the role of science and technology in politics and society, feminist science studies, and environmental history.

The central question for this dissertation, “How are people coming to know and respond to climate science beyond the binary of belief and denial?,” is inspired by a long history of epistemological studies within cultural anthropology, sociology, and science studies. These disciplines continue to show how knowledge is historically situated and constructed with cultural norms and political ideologies. Scholars working along the grain of the sociology of scientific knowledge, or SSK, in particular evidence that science is not merely affected by historical and social contexts or political ideologies, but that science emerges in co-constitutive relation with these forms.⁵³ Naomi Oreskes and Eric Conway’s work, for instance, evidences how the *long durée* of Cold War, anti-socialist politics ended up framing our contemporary national debates about whether or not climate scientists can be trusted or emissions regulations put in place. Importantly, they show that the U.S. public has come to know climate science through a matrix of political contestation—anti-socialist v. pro-regulation—created mainly by macro historical forces, like the nation’s reactionary post-WWII “red scare.” A second example relevant to this study is Paul Edwards’s conceptualization of climate science as a matrix of “global knowledge infrastructures” that require “truces” among scientists to function across national and disciplinary borders.⁵⁴ Indeed, “climate science” is more accurately defined as an irreducible meshwork of international discourses and relationships among experts co-constituted by immutable mobiles

⁵³ For more on SSK see Mulkay and Knorr-Cetina, *Science Observed*; Bloor and Barnes, “Relativism, rationalism and the sociology of knowledge,” and Collins, *Changing Order*.

⁵⁴ Edwards, *A Vast Machine*; Edwards, “Knowledge Infrastructures under Siege.”

(like computer models).⁵⁵ Together, Edwards shows us, this complex of actors makes global warming thinkable today.

I am inspired by such scholarship to examine how *micro*, or local, histories, social and environmental forces affect how people at the center of climate politics in South Florida are coming to know and respond to climate predictions. I think of epistemic objects of climate, like sea-level rise predictions, through the social construction of knowledge and treat them as more than the laboratories of their origination—as inseparable from the socio-environmental landscapes that make them meaningful. Sea-level rise predictions must be made thinkable and meaningful in South Florida by infrastructures of belief, such as the Southeast Florida Regional Climate Change Compact and its supporting Resilience Officers. Climate predictions are social objects that accumulate a variety of meanings as they circulate across different groups who interpret and add critical data.

“Coming to know” climate science is not a passive process. Sea-level rise predictions do not enter into South Florida from above with immutable conclusions and actionable policy. Rather, climate knowledge emerges in an active process of construction or, more accurately, co-production. My analyses in Chapters 1 and 3 in particular build from Sheila Jasanoff’s foundational work on co-production where she refutes efforts to define scientific knowledge as “a transcendent mirror of reality.” Scientific knowledge, she explains, instead “both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions—in short, in all the building blocks of what we term the *social*.”⁵⁶ My study draws from these theoretical contributions, analyzing how climate knowledge is built from many

⁵⁵ Latour, *Science in Action*.

⁵⁶Jasanoff, “The Idiom of Co-Production,” 3.

directions and sources. This dissertation also gives special attention to those bottom-up processes of co-production by paying close attention to the contributions socially marginalized groups, such as low-income Black and brown communities of Miami, FL, are making to the localization of climate predictions.

Agnotology, or the study of ignorance, is important for my analysis as well.⁵⁷ Coined by historian of science Robert Proctor, agnotology explores ignorance as something actively constructed and maintained. Agnotologists study what we do not know and why; how our knowledge gets curated by strategic and, at times, politically motivated erasure. As scientists are given powerful authority over the creation and legitimation of knowledge, they have a corresponding ability to produce a significant amount of ignorance. Agnotological studies of scientific practice therefore analyze where science produces ignorance and create a richer understanding of how ignorance manifests in scientific practice.⁵⁸ Following agnotologists, I analyze ignorance about climate adaptation and climate science denial as I found them in Florida. In Chapter 3, I examine the ways experts produce ignorance (racialized ignorance, more specifically) as they appropriate political critiques of climate resilience from climate justice activists and render them apolitical matters for technocratic management. Chapter 4 also contributes directly to agnotological discourse by mapping out the material and discursive infrastructure of climate denial currently operating in Florida's state government. While climate predictions are made thinkable, they can also be made *unthinkable* by infrastructures of denial that erase information, end relationships with scientists, and starve funding until efforts are winnowed down to nothing.

⁵⁷ Proctor and Schiebinger eds., *Agnotology*.

⁵⁸ Kourany and Carrier eds., *Science and the Production of Ignorance*.

I am inspired by feminist STS discourses of “strong objectivity,” where theorists lay bare how relations of modern domination can be reproduced through white Western knowledge creation and dispossess science of its socially constructed purity, stability, and omnipotence.⁵⁹ I treat climate predictions as malleable social objects with which my interlocutors add meanings—new forms of caring, new histories, new ways of imagining the future, and new methods of obfuscation to control the production of meaning. In this reframing, the question is not, “Do you believe in climate change?” Rather, it’s “How do we know climate change and from where, and with what priorities in mind, are we responding?”

How can we think about the ways we *should* be responding? Responses to climate science, like the climate resilience model, often construct climate change as a problem that we can only engineer our way out of, and can characterize political and social action as ancillary or even potentially dangerous to science’s mission.

Feminist social scientists and science studies scholars can help us rethink politics, ethics, and science together. Miriam Ticktin’s insightful work into humanitarianism’s capture of politics, or “humanitarianism as politics,” demonstrates the grave conditions such normative forms of “caring” have created for international asylum seekers.⁶⁰ Invoking María Puig de la Bellacasa’s *Matters of Care*, Ticktin and Katinka Wijsman tell us that calls for ethics in moments of crisis often mean “the institutionalization and normalization of ethics, from corporate ethics to Institutional Review Boards (IRBs)—in a way that reinforces rather than challenges established orders. That is, ethics is often spoken of and enacted at the expense of politics—it is used as a tool of depoliticization, replacing social and political justice, often by a focus on the individual

⁵⁹ See Latour, *Science in Action*; Haraway, *Modest_Witness@Second_Millennium.FemaleMan_Meets_OncoMouse*; Daston and Galison, *Objectivity*.

⁶⁰ Ticktin, *Casualties of Care*.

and the private.”⁶¹ In contrast to this capture, Puig de la Bellacasa asks us to think with Donna Haraway’s reclamation of “responsibility,” or, as Haraway herself defines it, our ability to truly, thoughtfully, and carefully respond in “intra-action” with others.⁶² This requires embracing the relationship and tension between ethics and politics, feeling and action, rather than dispensing rote solutions without political engagement and without, as Karen Barad and Haraway both note, responding to knowledge in its fullness as “a direct material engagement.”⁶³ “If we know well...we care,” Haraway tells us, “That is how responsibility grows.”⁶⁴ The root of *conscience*, or *con-science*, after all is to be with knowledge and to recognize knowledge within oneself. I use Puig de la Bellacasa’s phrasing, “ethico-politico,” throughout this dissertation to reference the relationship and tensions between ethics and politics, knowledge and engaged knowing in order to challenge modes of moral response that produce good feeling without substantial change.⁶⁵

Several ethnographers have already begun paving a path for thinking of climate change as a matter of ethics, rather than only a matter of fact. Take Candis Callison’s *How Climate Change Comes to Matter* (2014). She explores the inevitable discursive, meaning-making process that must occur at the local uptake of climate evidence. These sites, she argues, are

⁶¹ Ticktin and Wijsman, “‘Matters of Care: Speculative Ethics in More Than Human Worlds’ by María Puig de la Bellacasa.”

⁶² Haraway dives into responsibility in *When Species Meets*, for instance saying, “Response, of course, grows with the capacity to respond, that is, responsibility. Such a capacity can be shaped only in and for multidirectional relationships, in which always more than one responsive entity is in the process of becoming...that is, responsibility is a relationship crafted in intra-action.” See Haraway, *When Species Meet*, 71.

⁶³ Barad, *Meeting the Universe Halfway*.

⁶⁴ Haraway, *When Species Meet*.

⁶⁵ “A politics of care engages much more than a moral stance; it involves affective, ethical, and hands-on agencies of practical and material consequence.” Puig de la Bellacasa, *Matters of Care*.

points in the “production of care” for climate change as a serious issue, where uncaring publics are changed to caring publics through the adaptation of climate evidence to local discursive and ethical norms. She evidenced that coming to care does not happen with the presentation of raw data alone, but rather through “linking to what people already care about through a process of articulation and translation.”⁶⁶

This project—its conceptualization, methodology, and theory—is also deeply influenced by environmental history. Through the theoretical lenses provided by environmental historians I was able to see South Florida from the outset of my research as a hybrid, or naturalcultural landscape—with its picturesque tropical beaches that belie the intensive labor it took to produce and maintain their soft sands. They help me understand natural landscapes and forces, like sea-level rise and hurricanes, as essential actors in the co-production climate knowledge and response. I specifically build from Sara Pritchard’s concept of the envirotechnical,⁶⁷ or the continuous remaking of landscapes by forces natural, human, and technological, to situate the field laboratory work of my interlocutors in the Everglades National Park in Chapter 1. I also blend her conceptualization of the envirotechnical with David E. Nye’s contribution (1994) to the history of technology, or what he calls the technological sublime, to analyze the archival material presented in Chapter 2. I use the resulting hybrid concept—the envirotechnical sublime—to add to the rich body of historical literature on Miami and redefine it at its nascency as a racialized, high-tech playground.

Methodology and Overview of Chapters

⁶⁶ Callison, *How Climate Change Comes to Matter*.

⁶⁷ Pritchard, *Confluence*; Pritchard, “An Envirotechnical Disaster.”

To understand how people are coming to know and respond to climate predictions and to recast predictions as multivalent social and political objects, I chose my home state, Florida as my ethnographic field site. I had been researching socio-environmental issues there during my early graduate career, focusing on Everglades conservation science, water quality politics, and invasive species management.⁶⁸ While traveling back and forth from upstate New York to South Florida, I would visit my family and friends still living there, and, knowing that I studied environmental issues, we would talk about climate change. I came to realize that between 2010 and 2018, local and national media outlets had saturated Floridians with apocalyptic stories about the peninsula's slow secession to the ocean.⁶⁹ I witnessed as the people closest to me were beginning to know Florida in a very different way, and see their everyday experiences and envision their futures in terms of climate predictions. I saw an opportunity to use my training as an anthropologist and science studies researcher to observe this process in action.

The research for this project, the logistical planning, grant writing, document gathering, and supportive studying that helped me analyze my fieldwork took place over the course of 2 years. As a Wenner-Gren Dissertation Fieldwork Research Fellow, I conducted 9 months of “on the ground” fieldwork, mostly situated in Miami, Florida, so that I could be centrally located to events I would be attending and the institutions where my interlocutors worked. I positioned myself so that I was fairly equidistant from the Everglades, Florida International University’s main campus, the University of Miami’s Rosenstiel School for Marine and Atmospheric Sciences, the city of Miami Beach, and the offices of the non-profits I worked with: CLEO, Catalyst Miami, and the New Florida Majority. The groups I chose to focus on for this

⁶⁸Avron, “‘Governmentalities’ of Conservation Science at the Advent of Drones.”

⁶⁹ See Jeff Goodell, “Goodbye Miami,” *Rolling Stone Magazine*, August 30th, 2013, <https://www.rollingstone.com/feature/miami-how-rising-sea-levels-endanger-south-florida-200956/>

dissertation developed organically from my observations at central nodes of climate politics, like climate conferences and summits, where I saw these groups interacting.

I chose to follow university scientists, climate justice activists, and state bureaucrats in particular because I was offered access to their work spaces and their time. Additionally, I chose groups that could open up a diversity of institutional settings for me (laboratories, non-profits, and government agencies) where climate predictions were being interpreted, responded to, and built on.

My fieldwork among these different groups happened simultaneously rather than in distinct chunks of time. I kept a digital calendar of all of my scheduled interviews and events and my typical fieldwork day was textured with interviews, appointment-only archival time slots, talks given in university classrooms, and monthly legislative meetings. I took mostly handwritten notes while in the field and recorded and uploaded everything I could with consent. I spent most evenings summarizing my thoughts and reflecting on the day in “the cloud” through Google Docs.

Reflecting my methodological and theoretical premises, the empirical basis for this project is built from the ground up. Over 2 years, I conducted over 60 in-depth interviews and attended over 30 conferences and meetings using the “snowballing” technique—where an interlocutor refers to me to others in a network—to meet people participating and building up South Florida’s climate politics. I followed ecological scientists working out of FIU’s Wetland Ecosystems Research lab out into the middle of the Everglades, wading through chest deep waters and beating off mosquitoes while observing how researchers constructed localized predictions and interviewing them about their progress outside their laboratories. I conducted original archival research at Miami’s Black Archives in the Historic Lyric Theater that led me to

one critical oral history with notable local civil rights activist, Garth Reeves, who recounted details of his challenging South Florida's segregated beach environments (a transcript of which I am contributing to the Black Archive). This was a particularly exceptional opportunity given that Reeves passed shortly after. I enrolled and graduated from Catalyst Miami's 11-week climate education program (CLEAR), learning about climate issues, like climate gentrification, alongside a deeply diverse group of people. Along the way, I became a Community Emergency Response Team (CERT) certified along with my classmates and teachers, attended field trips out into the Everglades, and rode along on bus tours that taught Miami neighborhood history. I also traveled to Tallahassee, FL for a week to shadow civil servants working for the Florida Department of Environmental Protection, which was brief (due to access issues) but still extremely informative. I used document analysis of publicly available reports on the Florida Oceans Council and legislative records to supplement my interviews and fieldnotes for this chapter.

I start Chapter 1 by introducing my reader to the ecologists and geologists working out of Florida International University and the University of Miami. The chapter details how the work they do expands national and international climate predictions with critical local environmental detail. I show how in producing this local knowledge scientists become caring subjects of climate change and choose to jump into advocacy—or “the fast lane” of policy-making—as scientist-activists.

Chapters 2 and 3 build from each other to argue for new ways of knowing the past that pave the way for knowing new, ethically and politically informed climate changed futures. Chapter 2 examines original archival research in order to recast Miami's legacy as the “Magic City,” or the image of nineteenth- and twentieth-century South Florida as a technologically modern, tropical beach paradise. While climate scientists often forecast into the future,

hindcasting allows us to examine the prevalence of the past in the future imaginings of Miami presented by climate predictions. Specifically, the chapter argues that Jim Crow's political, cultural, and economic segregation was the very axiom, not a marginal result, of Florida's development as white America's high-tech seaside playground and that environmental segregation was the primary mechanism for regulating this oppressive structure. When we forefront Miami's Black environmental histories, a new source of knowledge about South Florida's social and ecological organization emerges. Climate justice activists argue that this history of Florida's racialized environment is essential for building ethical responses to climate change; that it should be considered a critical facet of the body of climate knowledge growing in South Florida.

Chapter 3 centers my interviews with anti-racist, climate justice organizers of color who are interpreting and responding to climate change predictions through Black environmental histories. My interlocutors forecast and circulate new kinds of climate predictions using these histories—foremost “climate gentrification.” While white, rich folks took the beaches, black and brown folks were relegated to a higher geological ridge farther inland. Now activists are using their histories and knowledge to demonstrate to Miami's officials that, with sea levels rising, these same communities of color still suffering will be doubly dispossessed of their environments in the near future if these histories remain unrecognized in officiated climate change projections.

Chapter 4 scales up to Florida's state government in Tallahassee to explain how a state so vulnerable to sea-level rise, storm intensification, and increased rainfall was able to create a discursive and material infrastructure of denial. Under the purview of Governor Rick Scott, the Florida Department of Environmental Protection (FDEP) canceled funding for programs

dedicated to ocean research and placed a gag order on phrases like global warming and climate change among FDEP employees. Drawing from agnotology, or the study of ignorance, I show that the state chose to respond to being called by climate predictions with strategic obfuscation of information and the displacement of science, and that the people in power did so to prioritize an economic ideal.

CHAPTER 1

Knowledge-Making and Responsibility: Scientists Situating Climate Predictions in South Florida

There is an obvious yet understudied relationship between knowledge-making and responsibility when it comes to climate change research. I interviewed University of Miami professor Ben Kirtman, a well-known atmospheric scientist and computer modeler who works with the IPCC and served as a U.S. representative at the Paris Climate Accords. He made an off-hand comment about how difficult it is to get graduate students and postdocs to work on anything else but local predictive climate modeling. “What’s interesting,” he explained, “is these projects...the actual amount of resources that come in [for them] are relatively small...But, when I’m recruiting students and I tell them about my portfolio of projects, they *all* [emphasis original] want to do prediction modeling. And I think it’s because graduate students want to save the world. They still want to save the world. I have eight other projects that are starved for talent to work on them! But they all want to work on the prediction stuff.” Even if funding is scarce, Kirtman explains, the climate changing world can still be saved, one decimal point of data at a time. Other topics in Kirtman’s portfolio can’t compete with the draw of a position where one’s research can directly contribute to ethically responding to climate change.

We can probably say with some degree of certainty that many researchers self-select into studying impactful topics. Yet, I argue it is equally true that climate change research is qualitatively different from other kinds for its current cultural resonance and gravity of its implications. The difference lies in prediction-building’s provocation of ethico-political questions and challenges. The kind of work Kirtman, his postdocs and graduate students are

doing connects researchers up to climate science’s “global knowledge infrastructure,” contributing to the cutting wound climate research has issued to our carbon intensive political economies and our sociotechnical imaginaries.⁷⁰ University scientists in South Florida localize big climate predictions, like the ones generated by international and national organizations, such as IPCC or NOAA. They do so by adding local data about the region’s unique landscape and atmosphere. Situating climate predictions, or building new local knowledge about climate impacts, is essential for adapting South Florida’s hybrid landscape to sea-level rise. As they work to expand predictions with contextual detail, they are turned into subjects of climate knowledge by the labor of their fieldwork and the alarming nature of their own research findings in a feedback loop. The more they study, the more disquieting their conclusions and the more many of them want to mount a significant response.

This relationship between knowledge-building and responsibility active within climate research reverses Gil Eyal’s “three lane highway” metaphor—where the “fastlane” of politics and the “slowlane” of science meet in the middle lane of regulatory science to try and create legitimate, fact-based decisions that benefit the public.⁷¹ Activated and captured by their own local predictions, scientists are instead the ones pushing policymakers in South Florida to take the predictions labeled as “extreme” more seriously as possible realities, to pool resources and “act” more quickly.

Building off of classic sociology, Eyal speaks of “an expert” as a social performance rather than a category of person, and controversial topics, like GMOs, vaccines, and climate change, as fodder for the middle lane of regulatory politics where “the expert” actually comes

⁷⁰ For more on Sheila Jasanoff’s conceptualization of sociotechnical imaginaries see Jasanoff and Kim eds., *Dreamscapes of Modernity*.

⁷¹ Eyal, *The Crisis of Expertise*.

alive. Here, all stakeholders in an argument over right action (e.g. How should climate adaptation funding be allocated?) produce convincing research conducted at credible institutions, by accredited persons, to defend their positions. However, for Eyal, the law is the stakeholder group who must move quickly and take “shortcuts” to limit argumentation in the middle lane to get things done, appealing to established precedents and authority during arguments and counterarguments within a limited temporality. “It is *never necessary*,” Eyal tells us, “*or possible* to produce the full defense,” or argue all potential avenues of thought, because a policy or bill must be voted on at some scheduled point in time.⁷² While the law needs quick closure, science (ideally) by its very structure is meant to take arguments “all the way down to the ground,” unpacking all possible positions and potentialities, and reversing conclusions whenever necessary.⁷³ This is an untenable practice for law, Eyal claims.

Yet my case studies demonstrate the opposite. For climate change researchers, conclusions do not need to be entirely stable in order for “action” to be taken. They do not want to take predictions “all the way down to the ground” in the middle lane. Or, as one ecologist of climate impacts explained to me, “It’s not just going to be bad in the future. It’s really bad now. *Now*; we need the action *now*.” If climate impact feedback loops are irrevocably altering the Everglades and, therefore, endangering the primary freshwater source of seven million South Floridians, it matters a lot less if there will be five feedback values or seven. Policymakers and government institutions, like Southeast Florida’s multi-county Climate Change Compact, instead are the ones often waiting for more compelling scientific conclusions so that they can build stronger, more defensible arguments for increasing funding flows and posturing themselves as advocates for other measures amenable to mitigation and adaptation.

⁷² Ibid., 88.

⁷³ Ibid., 88.

A group of climate researchers in South Florida has decided to create a culture of activism around their own research findings and respond ethically to climate predictions. They advocate for emissions regulations, more funding toward adaptation projects, and the replacement of unhelpful, “low-balled” local models.⁷⁴ It is the ethical thing to do according to their knowledge, not just the most accurate way of making decisions. Policymakers have moved at a dangerously slow pace when it comes to dedicating funding and resources to climate mitigation and adaptation in South Florida, especially relative to the level of urgency indicated by local predictions. They are, at times, also slowed down to a halt by federal and state climate denial. They ask for more and more accurate research to be conducted before conclusions can be reached and funding channels made available. Rather than the quick temporality of public debate in the middle lane of regulatory politics forcing closure on an issue as Eyal describes, policymakers have historically opened up funding mitigation and adaptation efforts to scrutiny, creating an endless number of committees and bureaucratic activities that ultimately delay action.

Localizing climate change predictions, or grounding the products of global knowledge infrastructures in context, intensifies responsibility because, with every conclusion, it multiplies the things South Florida needs to respond to. In this context, scientific research is an ethical response to climate change as well as a means of asking for greater, more careful responses, and researchers are responding to this mounting knowledge by becoming scientist-activists. The following chapter examines and analyzes how university scientists are expanding predictions and are making themselves into subjects of climate science in the process.

⁷⁴ At the time of my research the latest Southeast Florida Regional Climate Change Compact Unified Sea-level Rise Projections (2015) predicted under two feet of sea-level rise by 2060. They have since altered their projections because of the advocacy of scientist-activists interviewed in this chapter, but only in the long-term, keeping the “50 year” planning horizon for city planners and developers within two to three feet of rise by 2070.

The Interplay of Knowledge and Ethics: Building Sea-Level Rise Predictions

How sea-level rise will impact a particular portion of coastline depends on Florida's topography, geology, atmospheric conditions, and histories of, in Sara Pritchard's phrasing, "envirotechnical" engineering, or the landscape's continuous remaking by forces natural, human, and technological. From the perspective of real estate and urban planning, for instance, small amounts of sea-level rise only matter in relation to a particular neighborhood's elevation, which is a local measurement. General predictions amassed through what Paul Edwards has defined as global knowledge infrastructures must be made local, expanded through research that adds meaningful detail—that makes predictions, like sea-level rise, matter to a place. The more localized and detailed they are—the more tailored to South Florida's unique environment—the direr the predictions for South Florida's future become, and the more responsibilities to that future are illuminated. In the following subsections, I use interviews and select details from my participant observations that I collected over the course of my fieldwork to show the ways local wetland ecosystems scientists and geologists expand climate predictions with local data. I analyze their labor to explore the relationship between knowledge and responsibility present within South Florida's climate politics.

Ecosystem Scientists: The Future Lives in the Everglades

Florida International University researchers working through a National Science Foundation Sea Grant project are looking to expand climate predictions with local data for local application. Ultimately, they hope their findings will help create better water management, state and federal policymaking, and justify new funding flows for adaptation projects. The Troxler

Labs Sea Grant researchers are studying the rate of plant die-off in the Everglades, which is now a critical local detail that contextualizes sea-level rise. Eco-scientists' everyday labor grounds big climate predictions in the Everglades, finding the future there, creating a vision of the future where sea-level rises faster than the Compact's stabilized predictions and has additional cascading effects on local water management. Their conclusions challenge South Florida's sociotechnical imaginaries, calling into question the Compact's stabilized predictions and, therein, their assumed responsibilities to their present and future populations.⁷⁵

I had embarrassed myself at the Troxler Labs Sea Grant site, one of two field experiments located in remote areas of the Everglades, quietly nestled among the tall, monochrome sawgrass away from the trails tourists usually take. The Lab, spearheaded by a major figure in local climate politics, Dr. Tiffany Troxler, had built these sites for *in-situ* ecological field experiments four years prior to the start of my own investigation. At one brackish and one freshwater site, they caged marshland vegetation in "chambers," and dosed half the chambers with saline (using the others as controls), gathering an enormous amount of data stretched across years to predict how intrusive salt water will affect the Everglades ecosystem. They were maintained and worked on by an impressive crew of lab technicians and graduate student researchers, like Ben Wilson, who was using each Sea Grant site to gather data for his PhD in Carbon Cycling and Soil Biogeochemistry.

I was walking back and forth across the slender "boardwalk" that criss-crossed the brackish site and allowed the researchers to access the plant chambers. It was made up of a few long pieces of lumber propped up by shorter, stubbier pieces of lumber. The boardwalk was adaptable to movement. Researchers moved the boards around as they walked (and sometimes

⁷⁵ Jasanoff and Kim eds., *Dreamscapes of Modernity*.

crawled) to access the various dosed and controlled plant chambers under scrutiny. It was like a life-sized Lego set, with limited pieces. And if it had rained recently, portions of the boardwalk would be submerged below a foot of glassy green tinted water. When it pours, as it did with Hurricane Irma, the waters will rise up and consume the boards, tossing them around like pool noodles across the surface, making it impossible to work. Managing this precarity is part and parcel of the tacit knowledge one needs to work at these sites—tacit knowledge I clearly had not earned. Too busy snapping pictures, scratching notes, and making sure my recorder was securely “On” while asking questions, I took a confident step forward with my left foot and plunged through water and into an ancient, black peat soil of undeniable viscosity. I remained, my right leg propped up on the boardwalk with my left leg sunk deep into the muck of the Everglades until Nick, an intern lab technician, scuttled down the lane of lumber and pulled me out.

“That happens,” Wilson explained when we sat down for an interview. This one time, he told me, when he and Dr. Troxler were helicoptering into deeply remote sites of the gladesland, ones where no roads go, his first step off the chopper sent him straight down “almost all the way in” through the rich peat soil. In fact, Nick, the rookie intern who pulled me out, had fallen in recently as well.

At least the brackish Sea Grant site had a series of boards leading from the ditch off the road to the main walkway. At the freshwater site, Shelby Servais, a PhD candidate studying the effects of salt on marshland soil microbes, Wilson, Nick, and I had to wade chest deep in cold February waters toward an island of lumber at dawn. The marsh greedily grabbed at our legs with each step. It felt like your shoes could get sucked right off your feet and lost in the supple peat. I was holding a bucket of gear for measuring salinity above my head and calculating each step forward when I remembered the conversation in the truck on the long drive down. Being

told we'd be wading through water in a remote area of the Everglades, I asked if they were concerned about alligators. No, they replied. But, they then added, Shelby almost stepped on a gator once and sometimes they can be spotted floating around. My next footfalls were placed very carefully.

This was my introduction to how sea-level rise predictions get made through ecological science—that is, with great physicality and care. It is also how I became acquainted with Everglades peat soil, one powerful actor in the network constituting sea-level rise in South Florida.⁷⁶ The Troxler Labs project, is trying to figure out how salt water—already present in some areas of the marsh, especially the coast—is affecting gladesland flora. The research team bases their work on predicted sea-level rise, simulating present and future saltwater intrusion inland by “dosing” sequestered Everglades vegetation and its surrounding waters with saline at brackish and freshwater sites. Multiple projects build from this relatively simple simulation of the present/future, many coming to the same general conclusion. That conclusion, put simply, is that saltwater kills small ecosystems, one plant at a time replacing sawgrass and spikerush bushes with patches of open, brackish water.

The long-term, collective goal of the specialized graduate student and Sea Grant research projects is to be able to predict where die-off and collapse may occur; to use those predictions to begin thinking of ways to prevent future collapse from occurring; and to paint a more precise portrait of how the Everglades will function with salt water intrusion. Ultimately, their data will feed into South Florida's Water Management District's determinations of how South Florida's human populations will fare when living in an environmental future when open water supplants hundreds of acres of plant life.

⁷⁶ Latour, *Reassembling the Social*.

“We're only looking at this at one site,” Wilson explained to me during an interview, “But, [we'd really like to]...take the rate of change we're seeing at this site and identify other areas within the Everglades that are very similar, so we can see how quickly other areas of the Everglades may change in the future. So that's kind of the predicting formula.” However, the ability to predict—the creation of well-defined and scrupulously supported epistemic tools—is a ways off. In 2018 (the time of my fieldwork) Troxler Labs had just entered the early stages of hypothesizing *why* plants were dying. “We're just trying to get an understanding [of] why,” Ben explains, “and then we can use that to predict.” Salt water intrusion remains their best guess as to “why,” but the Sea Grant project is designed to prove that that is, in fact, the case, and then to create analyses of “how” exactly salt-water destroys soils and kills plants.

In a way, Troxler Lab builds the future directly into the marshland, injecting salt-water where, *sans* climate change, it should not be. To develop the experimental sites, they first isolated plants at both brackish and freshwater locations into “chambers”, wrapping them in malleable plastic collars sunk about a foot deep into their surrounding peat soil. Control chambers of unaltered plants and “dosed” salinated chambers, or those that received biweekly doses of a saline solution, lived on opposite sides of the boardwalk, which stretched out to provide end-to-end access so researchers could measure various elements of the plants' and soil's carbon cycling progression.

The experiments create an immense amount of detail for gathering—ph levels, soil bacteria quality and quantity, the length and width of each blade of sawgrass or spike brush, the length and diameter of exposed roots, all need to be measured precisely. And I learned through Nick that data gathering was a painstaking and physical process. He wobbled across the boards for four hours in the sun struggling to suck up water from each chamber for chemical analysis

with fat plastic syringes manufactured by a biotech supply company from abroad. Using these syringes requires forearm strength and tacit knowledge, other technicians gently teased him for his lack of both, “What? You’re not an expert at syringe pulling yet?” By contrast, the senior researchers moved quickly and quietly, hunching over plants and hovering over water, stretching out whichever way they needed to measure leaf length down to the millimeter, their bodies already adapted to the site’s particularities. Wilson and the lab techs had the additional task of securing a “carbon flux” measuring device—a transparent box equipped with air quality sensors Wilson built by hand for his dissertation project—over each of the twelve chambers to measure the plants’ carbon sequestering and release (among other details).⁷⁷

Each visit, researchers and technicians carry out a suite of measuring tasks, and use waterproof fieldwork notebooks to meticulously record numbers to multiple decimals, bring these numbers back to the FIU lab, and eventually transfer them into a computer database. These books of numbers, written over the course of years of field site visits, embody every misstep on the boardwalk, every pull of the syringe, every sunburn and chest deep trek through chilly early spring waters to reach the experimental chambers. Their accumulation and analysis have become a building block in the foundation of South Florida’s infrastructure of belief, as they expand global climate change predictions with local detail.

Studying the microbial reactions to saline injections in their experimental soils, their findings indicate that Florida’s unique marshland ecosystem makes the region unpredictably vulnerable to even a couple feet of sea-level rise. The 7,800 square miles of vegetation constituting the grass of the “river of grass,” along with its water’s immense weight against the ocean tide, has always served as a natural buffer against storm surges and flooding. The

⁷⁷ Wilson et al., “Salinity Pulses Interact with Seasonal Dry-down to Increase Ecosystem Carbon Loss in Marshes of the Florida Everglades,” 2092–2108.

marshland slows hurricanes down, decreasing wind speeds and absorbing some of the momentum of their surging ocean waters. The Sea Grant research is beginning to show that salt water intrusion may be slowly wearing away this buffer—plant by plant, patch by patch.⁷⁸

Loss of plant life portends an ominous future for South Florida’s water management as well. Two-thirds of all Floridians open their taps and drink water siphoned out of the 4,000 square mile Biscayne Bay aquifer. However, few realize that much of that water is routed from directly beneath the Everglades, and only *after* all of its impurities have been filtered out through gladesland plant life and soil. The Everglades and the aquifer together make freshwater accessible in the southern peninsula. Cara Capp, Everglades restoration program manager for the National Parks Conservation Association, describes the quality of that purification starkly in an interview with WLRN, explaining that even bottled water has higher phosphorus contamination than the waters filtered through the Everglades vegetation-soil complex: “If you poured out a bottle of bottled drinking water, it would be a [legal] violation...It’s nature’s perfect filtration system.”⁷⁹ However, its purity is directly proportional to the ecosystem’s health. Patches of open, salinated water across the southern Everglades will decrease the quality of eco-filtration, forcing South Floridians to reengineer how they access freshwater or to build up desalination efforts.⁸⁰

When I sat down with Capp for an interview, she succinctly explained how the twentieth-century history of Everglades landscape engineering has stripped the Everglades of its natural ability to combat sea-level rise. “I’m sure you’re familiar with the concept that the

⁷⁸ Wilson et al., “Declines in Plant Productivity Drive Carbon Loss from Brackish Coastal Wetland Mesocosms Exposed to Saltwater Intrusion.”

⁷⁹ Caitie Switalski, “Florida’s Natural Filter: Everglades National Park,” *WLRN*, August 24th, 2016, <https://www.wlrn.org/environment/2016-08-24/floridas-natural-filter-everglades-national-park>.

⁸⁰ The South Florida Water Management District has implemented dozens of projects attempting to restore the natural flow of the everglades in order to manage saltwater intrusion and has additionally proposed tapping into the Florida aquifer, a massive freshwater aquifer that rests beneath a layer of confining material underneath the Biscayne aquifer.

Everglades once was just [this] spanning ecosystem bigger than New Jersey,” she told me. You know, we really had the flowing river of grass. The whole bottom of Lake Okeechobee—the Southern border [of the lake]—was nonexistent. It was just a flow over.” The federal government owned the land around Lake Okeechobee and only ceded it to the state under the condition that prospectors would be lured in to make a “new developable frontier,” as Capp put it. Circa 1915, early white settlers around the lake created a make-shift dam at its southern border out of sand and muck, drying up the surrounding land for agriculture. After a devastating hurricane in 1928 washed this first dam away, drowning 2,500 people, the U.S. Army Corps of Engineers replaced it with 67.8 miles of concrete levee, capturing the lake’s waters and preventing them from spilling over. Ultimately, they halted the Everglades’ southward momentum. Florida’s Water Management Districts dug drainage hundreds of miles of canals, lakes, and levees to gain more precise control over the Everglades flow, diverting its energy in ways that ensured and fortified human development across the twentieth-century.

Portions of the Everglades had been engineered substantially before, notably by the powerful Calusa tribe who built extensive networks of canals and shell mounds to support their political-economy networks, creating an expansive reach across the peninsula’s territories.⁸¹ These efforts sustained livelihoods. Conversely, the modern damming of Lake Okeechobee by white settlers has proven to be a deeply unsustainable and short-sighted attempt at controlling the Everglades.

With no pressure from the north to generate resistance against the rising seas pushing in from the south and southeast, salinated water creeps inland—ascending nine inches during the twentieth-century and gaining one inch every three years, with the expectation that its rate of

⁸¹ See Darcie and Marquardt. *The Calusa and Their Legacy*.

growth will accelerate with continued Arctic melting. However, sea water seeps insidiously, abetted by Florida's unique geological formation. While the ocean will continue to crawl up onto the shore, it is also making its way through the Biscayne aquifer's opening to the seabed. Salt water seeps inland—much farther inland than expected—to rise up from below, ascending through the limestone bedrock and into the peat soil, thus causing sawgrass die-off. Salt will significantly interrupt a key moment in the cycle of South Florida's primary water filtration system. The more patches of open brackish water created, the less the Water Management Districts can count on that water being as pure as they once expected

Plant death also releases carbon. Lots and lots of carbon. Early findings suggest that where plants die the peat soil held together by those plants erodes and eventually collapses, creating a potentially irrecoverable dead zone where the open water patch is too deep and future plants cannot take root. What once was a major “carbon sink” may become a huge carbon release.

Dr. Troxler selected a brackish site of primarily sawgrass vegetation and a freshwater site of spikerush—both aqueous, marshland plants central to the health of various Everglades ecosystems—inland, away from creeks or tides, so researchers know that any salinated water measured there will have risen up from the Biscayne aquifer. If you were to glide across the marsh on an airboat ride, these tall spiky plants would dominate your vision. However, their most valuable feature lies beneath the water's surface. Sawgrass and spikerush suck up carbon from the atmosphere during photosynthesis and use that carbon to build roots a foot or so deep into the soil, and then grow upwards out of the water several feet high into the air. Importantly, their deep roots pull the soil together, allowing it to build up overtime. The plants essentially create the context necessary for the slow decomposition process that then creates the murky,

viscose peat that I got stuck in. In fact, roots make up 80-90% of total peat soil composition; ergo, they sustain the carbon cycling system that constitutes the Everglades as we know it today. The glades have lost around 24% of its original peat soil and two meters of fresh surface water since human engineering began, with the consequence of killing off half of the park's southern ecosystem.⁸² Now, the combination of freshwater diversion and saline concentration caused by sea water rising up from the Biscayne aquifer burns the candle at both ends. The Everglades' twentieth-century envirotechnical history will meet at a vertex with future sea-level rise, exacerbating peat soil collapse. "So it first starts when salt water comes in..." Ben says, describing his dissertation's findings:

"We're seeing that [the plants] are really resilient when you look at the above ground part...Then as it keeps getting saltier and saltier, when you look below the soils, what we're actually seeing is there's a loss of roots. And because roots make up most of the peat soil, when you lose those roots, the soil is going to start to degrade. And that's why you see these, I call them pedestals. There just these big clumps of sawgrass that are alive [on top], but then you see all the exposed roots."

⁸² McVoy et al., *Landscapes and Hydrology of the Predrainage Everglades*.

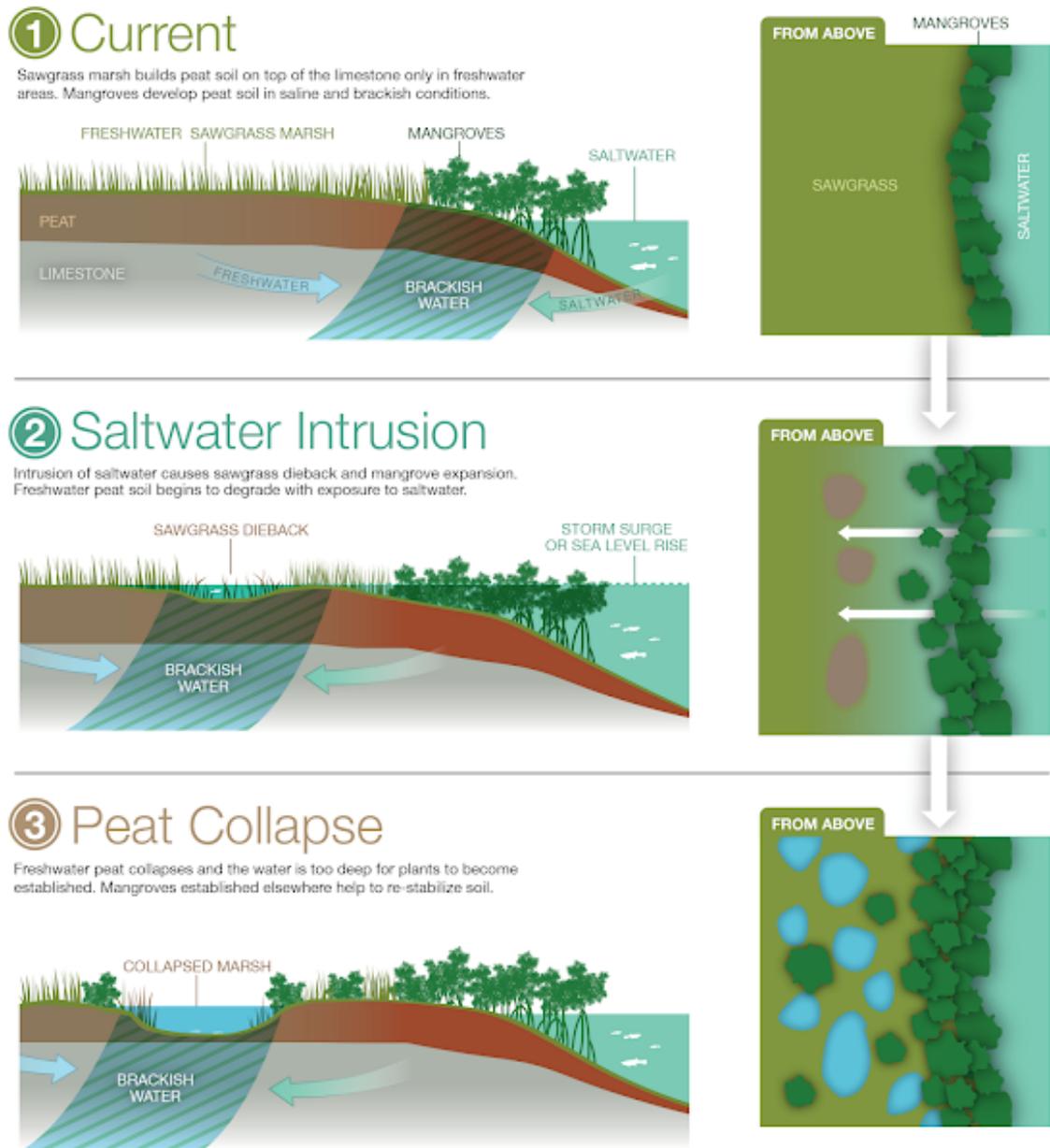


Figure 1.2 A visualization of the peat soil collapse process, provided by the Everglades Foundation.

Similar to the way Arctic ice compacts and stores ocean water, taking large amounts of liquid out of global cycling, marshlands sequester carbon: their plants suck carbon out of the atmosphere and store it in their tangles of roots and peat soil, in fact, taking “disproportionally large amounts

of carbon” out of global carbon cycling systems.⁸³ Ben’s years of thesis research provides substantial evidence that increased salinity impairs the biogeochemical processes central to photosynthesis, inhibiting plant’s from feeding themselves and growing strong, plentiful roots. However, his work also shows that impairment is amplified by “dry-downs,” when freshwater in areas under water management’s control sinks below the peat surface, exposing roots. When the water tables shrink below the soil surface, researchers “observed an approximately threefold increase in CO₂ efflux from the marsh as a result of elevated salinity.”⁸⁴ In these cases, the brackish water site experiments demonstrated that marsh “shifted from a C sink to a C source”—that instead of storing carbon, the degrading plants and peat soil released carbon into the air.⁸⁵

New Army Corps water engineering efforts to restore the Everglades’ northern flow are racing against time.⁸⁶ If the Sea Grant project gives any indication and the pattern of peat soil

⁸³ Wilson et al. “Salinity Pulses Interact with Seasonal Dry-down to Increase Ecosystem Carbon Loss in Marshes of the Florida Everglades.”

⁸⁴ Ibid., 2092.

⁸⁵ Ibid., 2092.

⁸⁶ The Army Corps, along with a coalition of state experts working within the Comprehensive Everglades Restoration Plan (CERP) have already begun attempting to reverse engineer the Everglades water flow—enhancing this envirotechnical regime by building massive bridges along a major state highway called Tamiami Trail that once cut the Everglades in half horizontally, from east to west. “Tamiami trail,” Cara Capp explained, “is now bridged a full mile and the water is successfully flowing underneath to the Everglades. And we broke ground on another two and a half miles of bridging, and there’s another five miles of bridging envisioned. So the idea is to have about an 11 mile stretch of Tamiami Trail, either bridged or elevated so that water can flow underneath.” Water—freshwater—is being reconfigured to return. The Army Corps, state Water Management Districts, and nature lovers more generally narrate bridging efforts as restoration—as a return to “the past,” or at least *a* past carefully narrated by contemporary ecological scientists and engineers. The idea is that the Everglades will be a spatial landscape as well as a temporal landscape, both a place and a point in time. More specifically, it is becoming a concrete example of South Florida’s budding belief infrastructure’s response to the predictions; building the past into a landscape in order to mitigate future socio-environmental devastation. Through various interviews I learned that restoring the Everglades’ water flow was never openly intended as a solution to sea-level rise, it was part of a multi-billion dollar Congressional package established in 2000, and at that point, I was told sea-level rise was “not on the table.” Yet, it’s becoming one of the best responses to climate change predictions.

collapse continues, it will be too late to rescue the ecosystems currently dying off. To wit, this means 1) diminishing South Florida's best natural buffer against storm surge, 2) expediting and intensifying saltwater intrusion into freshwater sources, and 3) potentially killing off a carbon sink and releasing that carbon back into the atmosphere.

Geologists' Expanding Predictions: The Future Lives in Rocks and Ice

While the wetland ecosystem scientists described above expand climate change predictions with granular data collected on the microbial level, geologists operate on a larger scale, thinking in terms of grand planetary narratives, identifying cyclical patterns of the earth's broader systems that occurred over the course of millions of years and projecting them into the future. Geologists who have studied what's called the Coastal Plain (the rock foundation of the southeast North American continent) and the Florida peninsula specifically, including its surrounding underwater terrain, expand climate predictions with local detail in two important ways: through time, by connecting the peninsula's ancient geological history to its future; and across space, by connecting its coastal, beach terrain to the ice sheets of the Arctic poles.

Geologists reconstruct whole ancient atmospheres by "reading" rock formations, like barrier islands, reefs, former beaches, and terrestrial ridges and underwater ridges. They analyze the minerals and fossilized organisms that makeup the rock as well as the patterns of their stratigraphy and match those analyses with contemporaneous atmospheric and oceanic conditions (often estimated from chemical analysis of the bubbles trapped in Arctic ice core samples). Through careful analysis, geo-scientists create narratives about how and why certain topographical, subterranean, and atmospheric features changed over breathless leaps of time—across hundreds of thousands and millions of years. For instance, when geo-scientists

identify the carbonate rock and layers of minerals and fossilized sea creatures present in rock stratigraphy along South Florida's coast and couple that strata analysis with other studies of the region's tidal grooves (the thin valleys carved into limestone by massive tides washing back and forth across the landscape over millennia), they determine that the peninsula's shoreline has moved dramatically inland and then farther out to sea at least four times in its geologic history. At times, the bottom half of the peninsula was entirely under ocean water and, at others, its terrain stretched out 100 feet beyond the present-day shoreline. Geologists can then analyze rock strata to determine what the earth's atmosphere was like when sea-level was either high or low. For instance, when sea creatures are found in a line of rock stratigraphy, they can use the study of ancient biology to determine the kind of atmosphere those creatures needed to survive. They can also reference Arctic core sample analyses and pair the chemical composition of that strata to the peninsula's coastal stratigraphy. Geology's temporally and spatially expansive methods have allowed scientists to connect the physics of earth and sky, proving a consistent pattern from which they write a reliable narrative: the rock record shows that a carbon rich atmosphere causes Arctic melt, which leads to sea-level rise, which leads to the geological transformation and major flooding of the Coastal Plain, at times, totally submerging the Florida peninsula. Geo-scientists build climate predictions for South Florida by narrativizing the peninsula's pasts, claiming that sea-level will rise much more quickly and much higher than South Florida's governments currently account for.

Sam Purkis, a professor of Marine Geoscience at the University of Miami, explained to me during our interview that one of the most pertinent questions for geologists today is, not *if* sea levels will rise more than current models predict, but *how quickly*. "Things can often appear [as if they happened] instantaneously" when you're looking at a rock sample, trying to read it. He

tells me, “It's unclear if [the sediment layers you're seeing] play out over centuries or thousands of years, it's very difficult to get that level of fidelity from the rocks. So, this is a very compelling question at the moment: [when] sea level appears to rise almost instantaneously in the rock record, is that really on human timescales or something much longer?” Does a single thin layer of rock presently identified indicate that ocean warming and ice melt caused global sea levels to rise slowly and steadily in the past? Or does it show that rising waters move in dramatic, quick stochastic pulses?

I tagged along on a field trip to a private beach along Miami Bay with Purkis and one of his undergraduate classes on a perfectly sunny day. We ventured out to “read” a small rock cliff and see what it could tell us about the peninsula’s relationship to sea-level rise. I listened to the casual conversation among the geo-scientists-in-training as we passed peacocks fanning out their feathers in territorial displays beneath giant banyan trees. We reached the shoreline and climbed a couple of meters down a stubby cliff onto the sand, lapped by aquamarine waters. The face of the cliff showed white, grey, and pink stones with smatterings of holes, like it had been riddled with buckshot. These rock formations were pushed and pulled into their layers by the churning ocean of their times, which would shoal little balls of carbonate rock, or rock made of dead creatures. These tiny “oids,” crushed bone and coral, makeup Florida’s carbonate limestone layer. Over tens of thousands of years, between glacial and interglacial, or melting periods, the ocean moved back and forth, pulled to-and-fro by the Earth’s Arctic poles, creating the coastline stratigraphy we were looking at that day. Studying ooids adds clarity to predictions, allowing geologists to analyze the substantive qualities of South Florida’s rock foundation—detailing the ways the limestone substrate will respond to sea-level rise. Minerals, like Appalachian sand quartz, mollusk shells, sea urchin spines, and branches of coral accumulated along the

peninsula's shores across previous periods and were subjected to the ocean's flows. The tide rolled these materials back and forth, over the course of tens of thousands of years in the peninsula's channels. The oscillating movement coated them in calcium carbonate, turning them into, as Purkis described, "tiny, perfectly circular sand grains," transfiguring them from their original carbon structure into crystalline rock, or ooids. These ooids then slowly coalesced into aragonite limestone, which serves as a substrate barrier between South Florida's surface and the immense freshwater aquifers below.

During our interview, Purkis explained, "Of course we always thought the Dutch have dealt with living below sea level for 600 years, and they've come up with all sorts of clever ways [of dealing with flooding]—building dikes and canals and the windmills to pump the water out." However, their success at controlling water has "all to do with geology." Holland sits on clay. When the Dutch build a dam and canals to divert water and prevent damaging flooding, the water will follow the paths laid out by their environmental engineering because clay is hard and tightly structured, making it an impervious foundation. Though their surfaces may look similar, the subterranean geological processes that formed Holland and Florida were dramatically different. "The sea doesn't come up through the ground [in Holland]," Purkis continued, "In Miami, these limestones and the oolitic sand deposit are very permeable and porous. So, you can build any sea defense that you want. The sea will just come underneath it and rise up through the floor."

We paused and Purkis laid out a large laminated map that highlighted the topographical and geological features of South Florida—from Fort Lauderdale to Homestead—in tones of green and red. He moved between pointing at various features on the map and the cliff face, as he asked the class, "If we were here 125,000 years ago, what would it look like?" There's a

moment's silence, so he adds, "So we agree," pointing to the Atlantic ocean, "that this is sea level, this is the present day and this," he points to the exposed stratigraphy of the cliff face, "goes back [down] a million years." He continues, pointing to a graph next to the map on the ground, "you can see [sea level] goes up and down, and up and down, and up and down. Why does it go up and down?" A student finally answers, "Because of the ice." "Because of the ice," Purkis responds, "because we're going into an ice age and out of ice age, into an ice age, and so on and so forth...If we were standing here 125,000 years ago, well, we'd be gasping for air because the sea would be somewhere, you know," he points to a tree at the top of the cliff, "halfway up this beautiful palm tree, about 6 meters higher than today. And as we've discussed...it tells us that even without human influence, the ice caps can melt much more than they are at the moment and rise sea level considerably higher—six meters, that's nearly 40 feet." He continued, "if we looked towards the Everglades [in that period of time], the whole platform of Florida would have been flooded and the Everglades would have been a shallow sea, probably five, ten meters deep."

He explained that the corrugated stone in front of us, its pocked-marked structure and different mineral layers—iron that floated over from the shores of West Africa and Appalachian quartz sand brought down by longshore drift—were formed at the same period of time as the tidal channels that swerved around South Florida's terrain, carving out wide and short plateaus. During the Penultimate period, 125,000 years ago, "rigorous tidal motion" of high sea-level coated minerals, turned them into ooids, and formed this coastal cliff's carbonate layers.

He concluded this brief lecture by giving us an assignment: "The first thing I'd ask you as the experienced geologists that you are all becoming, is: how do we know that this barrier bar, that this sand deposit, originated in the sea?" Put another way, how do we know that this

coastline was created by a high sea-level rise and violent tidal forces? How do we read the ancient rock record for evidence that ice melt caused rapid and dramatic changes to the landscape and shoreline? The implication: what would finding such evidence in this rock ridge mean about the sea-level rise we are experiencing today and that we will experience in the future? Purkis told the students and me to spread out and look for fossilized sea creatures embedded in the rock—the presence of certain kinds of organisms indicating that the rock cliff had been formed underwater. A student pointed out a fossilized conch shell (the shells of sea-slug type creatures called conchs) lodged in the top of the rock formation, seen in Figure 1.3. Purkis gave a kind of nervous chuckle, “A conch shell is pretty indicative of [the land being under the] sea. He doesn’t like to be on land, that’s for sure.” A few of us within earshot stood around in half-circle staring at the rock wall, gazing at the fossil in silence as the past and the future settled into view together in its spiral formation.



Figure 1.3, a fossilized conch shell formed around 125,000 years ago and embedded in the cliff rock wall along the beach. Photo by the author.

“The past for us,” Gregor P. Elberli, University of Miami professor of Marine Geosciences, explained during our interview, “is like a key to the present time. We try to see the rate of sea-level rise [in the past]. Did we have fast sea level changes [back then]? Where did [the water] go [when it melted]?’ That’s how we use the past to predict the future.” Geological scientists, like Elberli, expand climate change predictions for South Florida with big natural history, studying how ocean waters around the peninsula responded to ice melt caused by the earth’s natural carbon cycling processes. He reads the sculpted terrain, like a material archive of huge global systems, identifying the age and processes that forged the bumps and grooves on, below, and around the terrestrial peninsula by their unique sedimentary fingerprints, seeing the future in their composition. For instance, Elberli informs me that cuts of exposed rock found in the central plaza where wealthy Miamians wine and dine in historic Coconut Grove today indicate that the area was actually a beach 120,000 years ago. Those ocean waters encroached seven meters up today’s shoreline; when the earth was hot and ice was sparse.

Geologists analyze the earth’s minerals and physical processes—bridging time by connecting atmospheric-oceanic cycles hundreds of thousands of years apart. Yet, scientists are also bridging space in their climate predictions, building epistemological connections between seemingly irrelevant places through their analyses. Natural historian and author John McPhee describes how geologists help us see time differently, that one can “put their finger” on a line of rock stratigraphy “and touch forty million years.”⁸⁷ But that finger would also be touching an amassment of continents of places—the rock’s present stability belying active, if dense and slow, global processes that entwine the fates of distant shores, of beaches and ice sheets. According to

⁸⁷ McPhee, *Annals of the Former World*.

Harold Wanless, professor emeritus of Geology at the University of Miami (UM), Florida's future is irrevocably and critically linked to a place very far away, Greenland. He told me during our interviews that the future of South Florida and all vulnerable coastal places lives there. "The problem with [South Florida]," he told me in his basement office, "is that our future is totally dependent on ice and the ice melt right now...The real, practical question is how fast is ice melting. That's our future."

Given his geological training, Wanless was, to put it bluntly, pissed off by the 2007 IPCC report. From his own studies, he could tell that the prestigious international organization was "low balling" their sea-level rise predictions—for political reasons or otherwise. Claiming sea-level would only rise one to two feet by the end of this century was "ridiculous" for an area like South Florida, he told me. In fact, any projections below two meters, he said, are simply "meaningless," and he has since decidedly ignored them in his research and writing. When the earth warms, ice cracks apart and melts. "That's how sea level works. Period. And that is totally not in the [local] models [either], it's not in the philosophy." Computer models have been helpful for building climate predictions, yes, but they can only incorporate a certain amount of data and do not respond very quickly to lots of quick changes. Additionally, like all scientific facts and controversies, the models must be closed at some point, their values and data points held stable so their algorithms can run and come to conclusions. "[The IPCC] was too locked in to their mechanics of modeling," Wanless explained, and that was dangerous. They didn't, perhaps couldn't, incorporate the detailed narrative geologic histories of every locale along the Coastal Plain and all of the particular reactions those terrains would have to sea-level rise. The narratives created by geologists, however, could do that. Wanless uses his training to claim that sea-levels

will rise around Florida eight to ten feet by 2100, using his comparative analyses between South Florida's ancient coastlines and the apparent changes of the last 20 years.

Wanless spoke with a calm, almost lulling voice. My digital recorder at times could barely pick up the ends of his sentences as they dropped off the edges of our conversation. It became clear to me that it wasn't his manner of speaking, but the things he was saying that earned him the nickname "Dr. Doom" by national reporters.⁸⁸ Wanless explained that when we analyze climate change through geological sciences, we simply get more dramatic conclusions. According to Wanless, these are more accurate conclusions, largely ignored by South Florida's local government who purposefully "low ball" the rate of sea-level rise, refusing to "look past two feet." The first time we met I asked, why would they do this? His response was grounded in his disciplinary training, "Because they have no understanding of the past." The expert civil servants working within the Water Management Districts know that even a small amount of sea-level rise will have significant effects on water control structures put in place to move flood waters to safe outlets. "They have a graph," he explained during our interview, "that says for the next 20 centimeters of sea-level rise, 65% of their water control structures will no longer function," which means increased salt-water intrusion and neighborhood flooding where flooding was historically controlled. "And with 50 centimeters [I think it's] 82% of structures will no longer function. They don't want to talk about anything beyond two feet."

Prior to the "Dr. Doom" title, Wanless originally gain standing in South Florida's climate science community for his research on Cape Sable, the freshwater marshland ecosystem located at the southwest tip of the Everglades where he conducted a long-term study during the 1990s. He and Brigitte M. Vlaswinkel, a graduate student at the time, were commissioned to determine

⁸⁸ "#47: Philip Stoddard & Harold Wanless – The POLITICO 50." *POLITICO Magazine*, 2016, <https://www.politico.com/magazine/politico50/2016/philip-stoddard-harold-wanless>.

if sea-level rise had already affected coastal ecosystems and if so, to what extent. Rather than trying to figure out exactly what chemical processes are causing wetlands to collapse and give way to open water, Wanless and Vlaswinkel wanted to paint bigger pictures in broader strokes of time and space in the vein of the geological sciences. His methods reflected his goals, as he explained, cheekily describing his uncomplicated “style of science”: “Well, if sophisticated is putting aluminum poles into the limestone and then watching the substrates subside year by year, I guess that that’s what we were doing here.” It may be so simple it seems lazy, but, as he said with a chuckle, “It worked.”

By recording the rate of diminishing substrate and tidal flooding, along with the changing quality of waters and soil, and then comparing those data points to historic photos and archival records, the colleagues were able to show how a combination of environmental engineering, storm surge, and sea-level rise have together rapidly and dramatically exacerbated changes to Cape Sable’s landscape.

By 2012, Wanless had moved from measuring the tertiary effects of sea-level rise for South Florida to its second-order cause, ice melt, shifting his research team’s focus from Cape Sable, Florida to Greenland. He had been studying the impact of Arctic ice melt for over 20 years at that point and was drawn to the idea of “touching” the ice, he told me, of getting a “feeling” for the epistemic and physical connection that crisscrossed the planet and that synched the fates of two distant places. “I’ve been giving talks forever, I figured, well, you know, if you try to talk about something and you haven’t touched it or haven’t done the science on it, you’re dependent on somebody else. And I wanted to go and do simple research. I wanted to see...I wanted to see the ice sheet. I just wanted to see it. I wanted to get out on it...[Through research], I was touching it and doing something, so I [could have a] feeling for what it was.”

In 2012 and 2013, Wanless and his research team used a National Science Foundation camp in Greenland as a base for “touching” a great ice sheet. They found the glacier was being bifurcated by warm water, which had cut through the ice like butter and created a 500-foot-deep river valley. They lowered sensors into the glacial river to record the water’s temperature at varying heights, watching the degrees rise as the sensors sunk deeper under the water’s surface. “The warm water was getting in and melting from below,” he said, indicating that a powerful feedback loop of glacial fracturing was already at play. Warm ocean water comes through the bottom of the ice sheet, like the ocean rises up through limestone, and melts the glacier from below, weakening its base and causing the ice above to fracture and break apart. “It was hilarious,” Wanless said, a phrase he utters like a nervous tick at the end of long, harrowing explanations.

Wanless and his team also collected samples from the ice sheet’s surface. Black dirt from the Gobi Desert had been settling on top of the ice, exponentially increasing the absorption of heat from the sun’s rays. When it wasn’t covered in a veneer of soot, it was glistening with melted ice water. Flying overhead in a rented helicopter he could see that 90% of the ice sheet was melting, even up from 10,000 feet. “It was the most beautiful place we’ve ever been, but also the most sobering because you see what’s really happening,” he explained. “It was very, very instructive and beautiful.”

Unlike Purkis or Elberli, Wanless is notorious for taking the stage at government sponsored conferences and public lectures, and telling a packed concert hall full of people that the lower shelf of the peninsula—all of South Florida—will be underwater by the end of the century, explaining that the geological record evidences that a combination of porous limestone

substrate and glacial ice melt will push water eight to ten feet above its current level by 2075.

“We really kicked over the bucket,” he’d muttered to me during our interview.

When I asked atmospheric scientists, civil engineers, and Resilience Officers what they thought about Wanless’s predictions, they all had similar responses. I was told that Wanless was “overzealous,” or too extreme; that his findings claimed a kind of certainty that the science cannot provide yet; and that rates of change are, at this point, still unknowable. Purkis ushered caution into our conversation, saying that the difference between sea-levels rising dramatically in 100 years or rising slowly over the course of 1,000 years may not be significant for the planet, but it’s certainly a meaningful difference for humans. It might mean the difference between organizing total coastal retreat, which would require coordinating millions of people off properties hugging the peninsula’s beaches and the Everglades, or building up mitigation and adaptation efforts at an even keel, making decisions at the speed of innovation and new information.

However, Wanless’ colleagues both agree with his analysis in part: the rock record shows us that sea-level rises in sharp, unpredictable pulses that correlate with the speed of ice melt. There is an unnerving chance, though it cannot be predicted with 100 percent accuracy, that South Florida will experience something like 8-10 feet of sea-level rise by 2100. “Right now, for the first time,” Elberli continued, “we are over 400 [parts per million of carbon in the atmosphere], they just measured it in Tasmania. It [will be as] high as it was in the Cretaceous [Period], when all the ice was melted on earth.” Though the earth’s atmosphere has been enriched by carbon in significant parts per million before, this occurred in geologic time—over thousands or tens of thousands of years. Our current period—the oft dubbed “Anthropocene

Era”⁸⁹—is the first time in our planet’s known history that this much carbon has entered the atmosphere this quickly, warming our oceans at a rapid and exponential rate. Right now, Elberli informs me, the Arctic poles are “catching up” to the shock of human emissions. “We will melt all the ice, eventually,” he explained, “It’s just a question of time...sea level will come up like gang-busters sooner or later” and “then eventually there will be catastrophic jumps [in rise].” “I think we will inundate the whole half of the shelf of Florida again, this time,” he adds. Even Purkis, who used the most discretion while speaking to me, exclaimed, “I think the evidence that we have is that sea level can rise very quickly.”

A series of 14 panels hang outside of Wanless’ office, showing the progression of sea-level rise across the Florida peninsula—from six feet (or partial ice melt) all the way to twenty-four feet (or total ice melt). Wanless also uses images, like Figure 1.4, to show what the Florida peninsula probably looked like 130,000 years ago when half of the shelf of Florida was flooded and also what it may look like in the future. “How soon into the future?” is the socially and politically meaningful question geologists reading rocks, telling stories across time and space, are trying to answer.

⁸⁹ For details on the origin of the geologic concept, “the Anthropocene,” See Joseph Stromberg, “What Is the Anthropocene and Are We in It?” *Smithsonian Magazine*, January 2013, <https://www.smithsonianmag.com/science-nature/what-is-the-anthropocene-and-are-we-in-it-164801414/>. For scholarly critiques and reworkings of the Anthropocene concept (of which there are many), I suggest starting with Moore ed. *Anthropocene or Capitalocene?* and Pritchard, “Dangerous Beauty.”

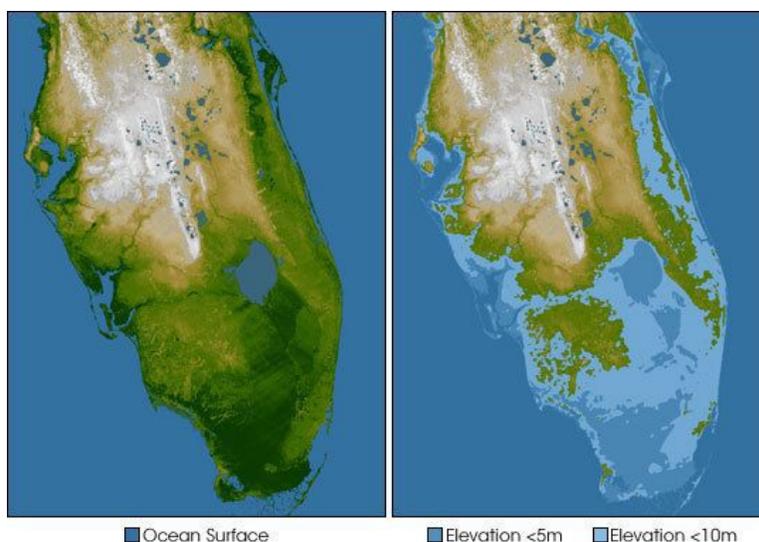


Figure 1.4 A computer rendering of the Florida peninsula currently juxtaposed against its projected future of 10 meters of sea-level rise. A progression of these sea-level rise photos hangs outside of Harold Wanless office in the University of Miami's Geology Department.

This chapter has so far shown that local university scientists provide the detailed research necessary for situating climate science in a particular place. It provides evidence for this dissertation's central thesis by demonstrating how new climate knowledge emerges on the ground and how a confluence of different disciplinary approaches can, at times, create different perspectives in which climate predictions matter for South Florida; and, therein, how people should respond. This point is most apparent in the conflicting opinions among geologists presented above. Overall, adaptation efforts must follow localized research and take into account all of South Florida's socio-environmental features; otherwise larger global calculations do not make sense for the region. As Wanless has known since the early 1990s, the fact that human induced global warming is causing sea levels to rise is just the very beginning of a much more complicated story, one that connects across young engineered ecologies and deep time. Importantly, the level and quality of response to climate change depends entirely on what climate knowledge the federal and local governments draw from. Should peat soil restoration take precedence as a "green" method of protection against sea-level rise or should Water Management

Districts instead use funds to adapt their water filtration and delivery infrastructures to salt-water intrusion? Should billions of dollars worth of stormwater barriers be erected along the coast or should South Florida be planning for mass retreat? It depends on which expert you ask, their discipline, and the specific nature of their work. In the following section, I draw from the same fieldwork among the actors so far introduced to expand on another facet of this thesis. I unpack the social form “scientist-activist” built around climate science and explore the connection between knowledge-making and ethics this category opens.

Scientist-Activists: “We have to deliver the bad news”

Harold Wanless was convinced that humans were causing global warming 20 years before his trips to Greenland in 2012 and 2013. Sea-level rise was a “curiosity” for him in the 1980s, but then became a cause to champion during his Cape Sable research in the 1990s. Journals were publishing about unseasonable ice melt at around the same time he discovered the shoreline at the tip of the Florida peninsula had retreated two feet since 1928 by sticking poles in the ground. For Wanless, the Arctic has loomed over South Florida ever since. The ominous nature of climate change built up within him at the rate he collected data; his mounting knowledge gleaned through hands-on fieldwork, rendering an increasingly disquieting and detailed image of South Florida’s future in his mind. “Even for me,” he explained, “the seriousness of [climate impacts] has accelerated through time.” Like many other climate change researchers in South Florida, he began dedicating a tremendous amount of his time towards volunteering, giving public lectures on the rate of sea-level rise (*his* rate, “ten feet by 2100”) and serving on committees that advise policymakers on climate adaptation. In a video recorded lecture from 2014, Wanless can be seen standing on a concert hall stage at Broward College

while a baby cries and coos in the background. In his calm yet certain voice, he says, “I want to show you about human induced climate change. I want to show you what it *really* is, and what it means for us—especially in South Florida. Because I think you’ll find it’s far beyond in seriousness and urgency, that you may appreciate.” He then points out that his fiancé is walking around the auditorium, handing out pamphlets summarizing the major take-aways from his talk that he had designed and printed himself.

University scientists studying climate change in South Florida are reaching out to educate the public about climate change with a sense of urgency and care. They lecture at night after long days of instructing and advising, and during their time off on weekends, laboring to warn undereducated audiences about rates of sea-level rise and ask them to commit their voices in the democratic process to change the status quo. The scientists creating localized predictions in South Florida have taken on the job of communicating the relationship between knowledge and responsibility by which they themselves have been made subjects.

At a conference hosted in the University of Miami’s Cox Science Institute in 2018 an atmospheric scientist presented on, what he called, “death spirals” in the Arctic, or how melting ice creates open waters that allow for cyclone storms to last for weeks and exacerbate thinning ice by moving warm waters around. During the Q & A, this same scientist stated solemnly, “We have to deliver the bad news.” We can point out the imperative of “have to” here, and the existential power of the kind of “bad news” scientists at this conference felt like they were charged with delivering to humanity. Whether or not other expert panelists participating in the conference agreed that it was all bad news (they didn’t), there was a tacit acceptance that because they had first-hand knowledge they were responsible to act on that knowledge.

Sheila Jasanoff comments on the way climate change has forced many of us to reflect on the otherwise taken for granted, “human place in nature.”⁹⁰ Jasanoff describes the alienating effect big climate science can have on how we understand our surrounding environments—in the way IPCC studies, for instance, can interpolate everyday experiences of nature with a totalizing authority that pulls us into abstraction. However, climate change also creates discordances for the scientists themselves. It seems like an obvious but understudied point that science communication is becoming part and parcel of climate change research. For instance, typing “climate change” in *Science Communication*’s toolbar brings up 355 articles, the majority of which start from the premise that climate science must be communicated to a wider audience, then develop what methods have been successful or unsuccessful and unpack interesting sociological or linguistic analyses as to why. I’d like to back up, and use this section to explore these premises, taking a look at why and how climate science has created a culture of activism, and how scientists are participating.

Speeding in the Middle Lane, or An Atmospheric Scientist Walks into a Bar

For scientists who are not professionally trained in science communication, policy advising, or political organizing, the culture of activism developing around climate research can disrupt what is normally characterized as science’s natural and comfortable distance from politics. In some ways, climate change has altered the common narrative of how scientists are meant to work with governments. Experts are meant to provide facts and suggestions to legislators, who can then choose whether or not to allow those facts to guide policy. Rather, climate scientists are “acting,” or attempting to mount a response.

⁹⁰ Jasanoff, “A New Climate for Society.”

At the state level, scientist-activism has looked like publicly pushing against gag orders on the phrases “climate change” and “global warming” as well as standing up to Republican partisans shutting down sea-level rise adaptation research and funding as we will see in Chapter 4. In South Florida, making an impact means learning to pivot towards making research legible to an undereducated or apathetic population, being able to communicate the domino effects of seemingly distantly related phenomenon (e.g. salt water hurts microbial communities, which kills plants, which degrades roots, which causes peat collapses, which creates open waters, etc.), advocating for more and better funding and attention to climate adaptation projects at conferences, working with the Resilience Officers network to expand predictions, and helping climate justice groups demonstrate through research how socioeconomic positionality determines true vulnerability to climate impacts (Chapter 3).

When I asked Ben Wilson, the Sea Grant researcher working through Troxler Labs at FIU, why he was committed to studying peat soil collapse. What kept him grounded while working on such an existentially threatening topic? He parried my question with a question, “Do you care about what happens to these ecosystems?” Ben’s concern for the Everglades’ wellbeing is not surprising. After all, scientists often care about their objects of study and want to make a positive impact on them while adding to discursive networks and knowledge systems. Yet, Ben isn’t only concerned for the Everglades. As he tells me, millions of people rely on these ecosystems every day, “whether they realize it or not.” “It’s really bad,” for everyone and everything in the path of sea-level rise. “Worst case scenario,” he explained, “all of the poor neighborhoods are forgotten while Miami’s trying to [protect] their downtown and [wealthier] Brickell financial district. Just building up walls to keep the sea back, but becoming a New Orleans type city below sea level, vulnerable to the next hurricane.” The meaningful, meticulous

labor he puts into researching peat soil collapse in the Florida Everglades connects up to a vision of a planetarily significant disaster—half of the peninsula being washed away, open waters having supplanted the river of grass, with human lives displaced or ended. It connects up to envirotechnical, political-economic, and ethical challenges that his research makes clearer. “I really enjoy doing the research,” he explained, “But, I also don't want to just be one of those people who only does research just for the fun of it. I want to make sure my research has an impact and can actually influence change in the future.”

In order for scientists, like Wilson, to produce knowledge that can positively influence climate mitigation and adaptation, they must step out of their laboratories and into the “middle lane” of regulatory politics that exists, according to Gil Eyal, between the realm of science and the realm of law.⁹¹ Unlike Eyal’s formulation, where politics hastens the pace of closure on controversial topics, Wilson will be the actor pushing for rapid changes toward adaptation with stable-enough conclusions. He has already begun redirecting his career toward a “more...management policy type path,” he told me, and has begun including water management implications in his manuscripts “to try and start the conversation” about peat soil collapse. If people don’t understand and use the science, he explained to me, then what’s the point of doing it?

Local scientists are routinely asked to share their expertise in an accessible way with local publics and policymakers in South Florida. University scientists are specifically invited to sit on boards for non-profit climate education and social justice organizations. These scientists, in turn, often look to structure their research around government adaptation projects and climate justice initiatives, to have some positive impact on preparing society for global warming. Their dedication is different from the expert-activists who join “biodegradable” affinity groups created

⁹¹ Eyal, *The Crisis of Expertise*.

by political organizers, which are formed around temporally and geographically closed environmental disasters, as described in Barbara Allen’s work. Foremost because climate change is a boundless and dense topic. It encompasses all populations within a society and all environments, not only groups affiliated with a particular event or problem, such as with oil spills, chemical pollution, or garbage dumps. Climate scientist-activists are becoming an institution in South Florida, solidifying as their own critical group within local climate politics.

The local university scientists I interviewed work to enroll the general population into a networked force for climate action. Figures 1.5 and 1.6 depict one of hundreds of free climate teach-in events that take place all across South Florida throughout the year. The images show health scientist Mary Beth Gidley and Ben Kirtman presenting convincing arguments for why South Floridians should “care” about climate impacts and the rate of sea-level rise, and how they themselves can become “empowered climate communicators.” Rather than being recruited into a cause, the scientists are the ones recruiting. Their efforts are reminiscent of Louis Pasteur’s galvanization of the French public. As Bruno Latour famously describes , Pasteur labored to get different groups who usually would not associate—farmers, doctors, state officials, etc.—to accept his microbe and his methods of pasteurization.⁹² While Pasteur worked against the odds, facing competition among peers and political contestation, one can only imagine what Pasteur’s efforts would amount to if the microbe were as difficult an object as climate change predictions, a faultline partisan issue. Gidley and Kirtman want to convince skeptics and use science’s seemingly politically neutral rational objectivity to get audience members to “act,” or vote in ways that support mitigation and adaptation efforts. As Kirtman explained in an interview, he tells folks, “I’m just trying to say, here’s the science. It’s up to the policymakers to ignore that

⁹² Latour, *The Pasteurization of France*.

science if they want or to include that science if they want. If I don't like their decisions, I can vote them out of office.”

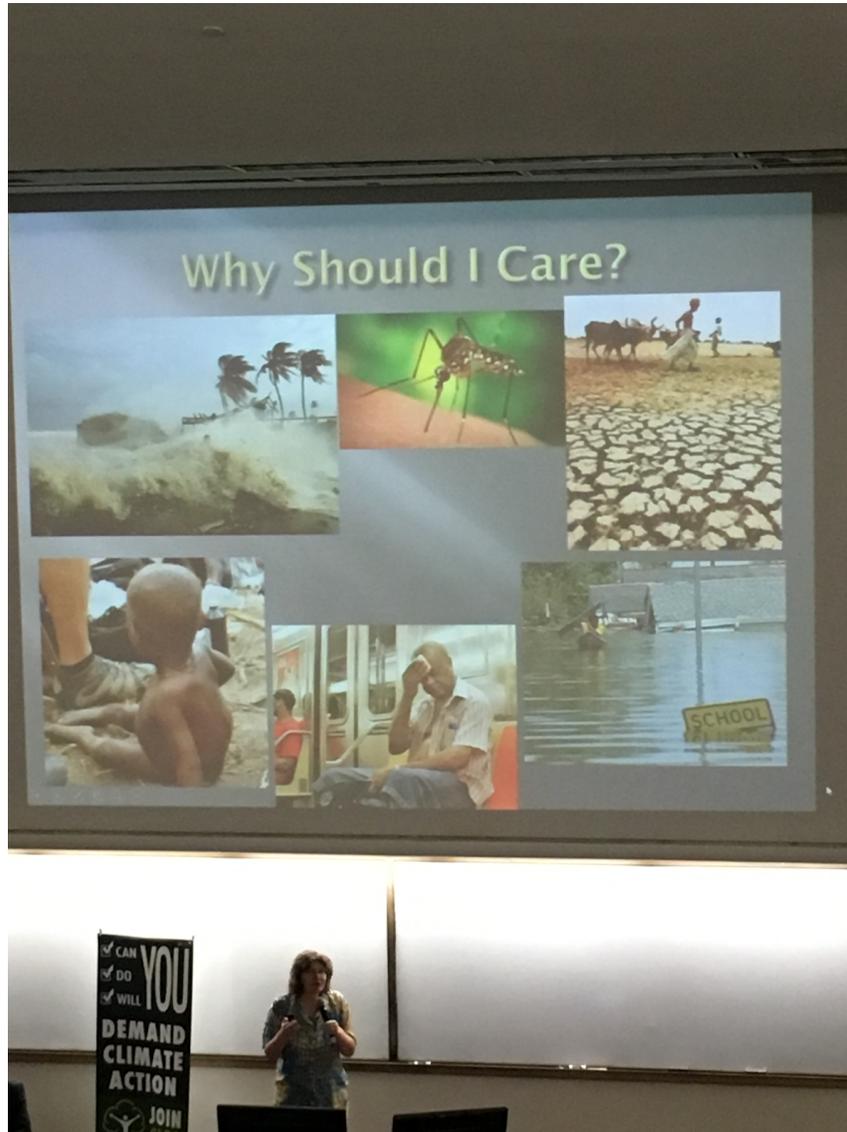


Figure 1.5. Mary Beth Gidley, Environmental Health Physician and Microbiologist, speaks at the CLEO Institute at the University of Miami's Cox Science Center Conference in 2018, answering the question "Why Should I Care?" next to a sign that says "You can, do, will Demand Climate Action."



Figure 1.6. Feb. 2018, Ben Kirtman stands in the front of the room, to discuss how the audience members of the CLEO Institute conference can all become effective “climate communicators,” to recruit others into action.

As we sat in his office for an interview, Ben Kirtman described to me that he feels beholden to educate the public, that “we have accepted a certain amount of climate change” already in our inaction and that adaptation is a bare minimum responsibility. “I [try] very, very hard to engage, what I call, the middle third,” he explained. “There’s one third of the world that has accepted the science of climate change and are actively seeking solutions” and there is also one-third in total disbelief. “But then... there’s a middle third that sees a fire hose of information. They have a certain amount of skepticism, but they’re open-minded. But they see this fire hose of

information.” Kirtman works to filter this “firehose of information” at public conferences and wherever he is asked to show up. “I’ll talk to energy providers [often seen as the enemies of climate mitigation in South Florida],” he told me, “I gave a presentation at a bar once. People were drinking vodka tonics at the same time [that] I’m standing behind the bar pointing to CO2 trends [on my PowerPoint]. I’ll do whatever it takes to get to that open-minded bunch. One of the most hostile audiences I ever spoke to was a garden club. These ladies laid into me.”

It’s an interesting image: Kirtman, a PhD from the University of Maryland-College Park, a full professor at a private university with postdoctoral and graduate students on waitlists to work with him, and an IPCC scientist who represented South Florida at the Paris Climate Accords with over 100 peer-reviewed articles published in reputable journals on using computational science to understand our changing climate, going toe-to-toe with happy hour patrons and garden club members. Kirtman, and scientists like him, feel compelled to spend their time recruiting anyone with an open mind enough to listen into their way of thinking. They are not only going to town hall meetings or speaking privately with politicians or giving keynote addresses at catered summits. Climate scientists in South Florida will go where they feel like they can “make an impact.” Any impact.

It’s an example of the kind of scientist-activism, or culture of activism among climate researchers in South Florida, developing on the ground and that is particular to climate change research. Recruitment into climate science has become a massive interdisciplinary, national and local effort, rather than being the goal of a single scientist and single discipline, as with pasteurization. Scientists are driven into atypical places in South Florida, stretching their patience, explaining the same concepts over and over in the repetition required of a persuasive

argumentation, because they understand their science's inherently atypical nature of closure⁹³: recruitment is, actually, not optional at all. Recruitment, as they see it, is a dire necessity. While all controversies and debates about validity are subject to temporal limits, as Gil Eyal concludes—that “at the end of the day not everything is up for debate, not all grounds can be criticized, because ‘we ain’t got all day,’”—climate change has its own temporality that is rapidly accelerating towards a kind of useful closure by the labor of scientist-activists.⁹⁴

How Climate Science Changes Scientists

The last time I caught up with Wanless, he was in the process of finding publishers for two books: one was a manuscript titled *sea-level rise: Past, Present, and Future*, and the other was a book of photos providing side-by-side comparisons of changes to Florida's land and shoreline over the past century. Wanless explains the points he makes in his publications repeatedly at public talks, over and over, like he's beating a drum. He explained, “What I'm trying to do [with these publications] is make people understand that the government's projections of 6.6 feet at the end of the century may well be low because we're starting to see accelerating ice melt.” His efforts have been worthwhile. While Kirtman helps educate the public on computer model findings, the basic facts of geo-science are becoming common knowledge in South Florida largely because of Wanless' tremendous efforts.

I was cued into the reach of geology's contribution to projections at a conference where heads of real estate LLCs and bankers were planning how to adapt South Florida's exponentially growing development to sea-level rise. During a Q & A after a panel discussion, an older white

⁹³ For more on the social construction of technology, or SCOT, and the concept of closure see Bijker eds., *The Social Constructions of Technological Systems*.

⁹⁴ Eyal, *The Crisis of Expertise*.

man in a blue suit raised his hand and queried why the region couldn't simply build dikes, dams, and canals to divert the rising tide, adding that the Dutch had successfully managed water overflow for centuries. The audience didn't give the panel on stage a chance to respond. "We can't," a man sharing the questioner's table responded. "Yeah," another man in matching business attire sitting kitty-corner continued, "We are built on limestone. The water just goes right through." The journalist sitting next to me jumped in, "It's like swiss cheese." The 2-4 feet of water blocking the roads and sidewalks during high tides, and inundating the car engines of impatient drivers, are like unplanned, uncontrolled field experiments that evidence geologists' climate predictions. These are moments of subjectification and sense-making. When the relationship among ancient rock structures and the ocean's future rise are made apparent (through public discourse or a lay reading of the environment) there is a context for geology's contributions as well as an impetus for understanding it, thereby imbuing geological sciences with powerful new social meaning.

In the context of climate change, seemingly mundane questions about natural history central to geological science quickly gain social and political meaning in South Florida because their answers paint clearer portraits of the region's socio-environmental future. The thickness or thinness of the layers in sediment, the markings and chemical composition from the Atlantic Coastal Ridge's rock record, may mean the difference between 4 meters and 10 meters of sea-level rise by the end of the twenty-first century. Finding a trustworthy metric with which to accurately gauge timescales in the rock record becomes more than good scientific practice; it's a matter of human urgency. Now that climate change discourses have proliferated and edged into everyday life, the basic practices of paleo climatologists and marine geoscientists show us where natural history will fold directly into human history, where the earth's ancient past and our

human future will meet in a cyclical pattern. Finding timescale “fidelity” in the peninsula’s stratigraphy has become as much fodder for a publication as it is for reconsidering the entire social and environmental organization of South Florida—the difference between adaptation or retreat at the level of policy making and taking on a 30-year mortgage or selling while you still can for the individual.

This is why researchers like Wilson and Servais were wading through cold, chest deep water and clambering across make-shift boardwalks in the middle of the Everglades to answer. Laura Bauman, the senior technician for Troxler Labs, manages data retrieval at the in-situ field site as well as ex-situ laboratory experiments in a FIU facility on the island of Key West. I observed as she sat in a squatted position at the brackish site for at least an hour, the brim of her hat and sunglasses doing their best to block the midday sun from her eyes as Nick relayed water samples from the chambers, back-and-forth across the boardwalk, for her to run through an analyzer. I watched as she recorded the results in a notebook.

LA: As you turn the pages [in that notebook] I see, like, all these detailed numbers in every single column.

LB: Yeah, a lot of detail. And then also, you know, it's important to remember, when you're tired and you're hot and you're just exhausted, that every one of these numbers does add up to the story. And you want that story to be the most accurate depiction of what is going on. All of it's important, it all contributes, every *little number* [exasperated laughter], which is averaged into that big number, which is put into a bigger number, which is made into, you know, high-level comparisons, statistical averages...All of it counts, on some level. I try to keep that in mind, even when the exhaustion sets in. When

you're just done for the day, you're like, 'Oh my gosh! I'm dying out here. The heat, the bugs.' [I try to remember that] it's all important."

The bigger numbers and statistical analysis—the artifacts of caring labor—also add new meaning to global predictions while they expand them with local detail for practical application. Researchers enact a kind of care while collecting data at the Sea Grant experiment sites that is, of course, important for scientific rigor—for instance, stretching your arm out a little longer over the water while balancing on a thin plank of wood to make sure one's sawgrass leaf measurement is as accurate as possible. As with scientific practice more generally, results are constituted by careful and, at times, intense labor; care manifested in numbers and their qualitative analyses, in late night visits to feed mice, treks through snow to check on greenhouses, and arduous database management. "Through affective and attentive engagements," Clémence Pinel et al. tell us, "researchers build long-term relationships with the data they help produce, and feel responsible for its flourishing and growth" through labor.⁹⁵

Researchers like Bauman and Wilson feel the weight of their work and have a sense that they are entering into a critical intersection—of the global and the local, of envirotechnical history and potential futures, of politics and science—when they conduct their studies. The gravitational pull of climate science draws them to their work and their meticulousness is a form of ethical response from this subject position that, in turn, changes predictions. When Bauman, for example, has a chance to pause and zoom out from the detailed numbers, from the vials of water samples, out from the brackish and freshwater sites, out from the Everglades, and orient herself to a "broader perspective," she gets a sense of the ethical gravity of her otherwise mundane job:

⁹⁵ Clémence et al., "Caring for Data."

It's just like any job—even though I feel like what I do is cool—the day in and day out stuff can get a little monotonous...So, I really enjoy it when I step back and get that broader perspective. I mean, of course I know why we're doing this work. But again, it's like you get caught up in so many of the nuances, in the minute details it takes to be a manager of [this project] and keep it moving [on] a daily level. So, when I get a chance to read a manuscript that's coming out of this research that we've been working on for almost three-plus years now, I feel very validated...[Producing important information about climate impacts] is why I got involved in this project. That's why this is so important. I know this is real-world stuff...The information that we are giving is hopefully being used by water managers as a resource, as real life data.

As Bauman says, working to build climate impact predictions is important to her—it's the source of “real life data,” that will, hopefully, be used to build sustainable futures and mitigate destructive ones. “I don't want it to have [to be a] complete environmental drinking water catastrophe,” she continued, “before the powers that be understand what's going on and make the changes that need to happen and quit resisting [climate science].” Understanding and predicting plant die-off in the Everglades would otherwise seem small, perhaps meaningful only to a particular network of experts interested in marshland ecosystem services. However, in the context of building climate impact predictions, it is a dense epistemic project, made so by the gravitas of global climate change. The labor at the Sea Grant sites connect a millimeter's width of sawgrass root density up, temporally, to a vision of salty open water supplanting an entire marshland, and, geographically, to the drinking water supply for a huge population. The act of local measurement will always be more than itself in this case. It pulls global knowledge

infrastructures down into context, where they can be imbued with new meaning, actionability, and ethical purpose—where they can be made to make local sense. Laura’s comments demonstrate how researchers nurture this connection to climate predictions’ pull. When they aren’t exhausted from their labor-intensive fieldwork, they take time to contemplate how the miniscule local data collected resonates with their own values and priorities for South Florida’s climate changed futures.

There is also an exceptional quality about working on predicting climate impacts for a region so vulnerable to sea-level rise. Every new data point and analysis reinforces the process of subjectification to climate predictions and emphasizes the data’s inherent ethico-political challenges. For example, when we were out at the brackish site I asked Wilson exactly how the Sea Grant experimenters use experimental chambers, how do they calculate how much salt should be added to the dosing solution? With saline analogizing sea-level rise, how far into the future do they want to travel in their experiments? He said the method was imprecise, and that they were still in the discovery phase, simply trying to gauge how the plants responded to pulses of salt-water. The general rule of thumb was to introduce more salt-water into the experimental chambers than those plants would normally get from the ambient, or normal Everglades, waters. But, he added, it might become difficult to determine how much saline would be required to make a marked difference for the plants because the ambient waters were becoming saltier. He told me that, once, after a long day of data collecting, he was asked to retrieve samples of ambient water around the chambers. He did so, and that water tested normally for the area. Ever the curious researcher, he decided to wander off and sample water just south of the boardwalk site. That water was salty, much more than it should be—in fact, as salty as their experimental chambers. The future—the existential, “hyperobject” of climate change—was becoming dense

and real, encroaching onto their small field laboratory. The sense he gave me was that it was uncanny and disconcerting.

Conclusion

When we interpret Wilson's experience, Wanless' disconcerting research in Greenland, and Bauman's description of quiet contemplation through the lens this dissertation offers, we see that as scientists produce essential contextualizing data for climate predictions they are also reflexively experiencing the process of subjectification to the climate knowledge they create. In the process of researching the ways climate change will affect (and has already affected) South Florida their social performance as experts changes. The category "scientist" expands to include "action," as the knowledge they make challenges them to assess the gap between knowing and responding. Their own conclusions rally them to buck the traditional metanarrative defining science as pure research as an end in itself. The global and the local meet in these moments. When researchers stand at the edge of a boardwalk in the middle of the Everglades or walk across Greenland's melting ice sheet, long histories of envirotechnical engineering and a century's worth of carbon emissions unfold into visions of a dangerous future for Florida. The scientists I study hope South Florida can begin to recognize itself in the climate predictions they create, to see its socio-environmental future in relation to this connective and contextualizing data and build appropriate responses.

I began using the phrase "scientist-activists" during the process of analyzing the fieldwork for this chapter, so I did not get the chance to ask my interlocutors what they thought of the category. Based on my time spent with them and the side conversations we had about the state of climate denial, I could guess that Wilson and Kirtman in particular might not be entirely comfortable with the phrasing. They might want to, at least formally, keep science safely away

from politics, seeing advocacy as “allowing the science to speak for itself”—even when they are the ones doing the speaking. Given decades of intense political polarization on the topic in the US context, one could reasonably assume neither scientist would want to be seen as pushing “a liberal” ideological agenda, and that they maintain, in their minds, the objective authority of science.

Still, I believe this chapter captures their hopes for translating the moments they experience in fieldwork, such as being knee deep in peat soil or “touching the ice” of a glacier, into ethico-political change. They want the data they are adding to Florida’s body of climate knowledge to change people’s values and priorities, as it has changed them so that responsible action. It became apparent to me while studying ecological and geological scientists building climate predictions specific to their location that climate knowledge has a special relationship to ethical response. The intimacy and historical importance of their labor and the constant feedback of harrowing data about the future encourages scientists to step out of the “slow lane” of pure research and into the middle lane and fast lanes of policymaking. Overall, this chapter provides science studies scholars one angle for examining the social forms currently emerging around climate predictions. It begins to lift the lid on the black box of “belief” to show the effects climate conclusions are engendering for science and policy.

CHAPTER 2

Hindcasting the Future: “The Magic City”

Garth Reeves and I sat on his back patio overlooking Miami’s bay on a brilliantly sunny and blustery day. Speedboats slapped the white crests of the mighty Atlantic’s waves behind us before careening off into the horizon. Reeves’ hazy blue eyes smiled at me during intermittent pauses of our interview where we had to let the roaring engines pass out of earshot before he could continue telling me his story. Ironically, I was there that day to interview Reeves about a much earlier time in his life—he was 99 years old that day—when this same coastline was at such a social distance to him, he had to fight in order to swim at its beaches.

Between 1957 and 1959 Reeves helped lead the National Association for the Advancement of Colored People’s charge to finally desegregate South Florida’s beaches and to integrate all recreational facilities (community pools, golf courses, etc.). “We had a special group...” Reeves told me, “people who were not afraid of getting beaten up or thrown in jail.” During one particular protest, his group was to meet at Crandon Park on Key Biscayne, an island close to South Beach, and simply try to swim at the whites only beach while local media looked on. However, despite their planning, only one other group member showed up at the meeting point. This, Reeves explained, was understandable. Sometimes you didn’t want to risk the humiliation of being beaten by white folks and police officers while not being able to fight back without being jailed or, quite possibly, lynched. The beaches were white-only environments.

I wanted to interview Reeves about the Crandon Park Beach protest because Black and brown climate justice activists in South Florida taught me to hindcast as well as forecast in my analysis of how changing climate will affect the region, in other words, to look to the area’s hybrid, human-environmental past as well as its future when considering the content and

meaning of climate predictions. This led me to the 1957 newspaper clipping at the Black Archives at Overtown’s Historic Lyric Theater detailing Reeves’ protest. In the restricted access room (and with the help of a deft archivist) I poured over a somewhat underappreciated fulcrum of civil rights history in South Florida: that of the battle over environmental integration, and for beach access more specifically, through legal action and civil disobedience.⁹⁶ For climate justice activists today, grappling with what’s to come means reckoning with the histories like Reeves’ beach protest. As such, Chapters 2 and 3 work in tandem to build an ethico-politically informed hindcast and forecast, examining how a history of white political-economic and environmental supremacy was etched into and preserved across South Florida’s landscape (Chapter 2) in order to infer how climate impacts will play out across this racialized topography (Chapter 3).

This chapter uses original archival work to extend recent scholarship detailing Miami’s rise as the “Magic City” in the late nineteenth and early twentieth centuries to argue that segregation was not only colloquial and federal law in Jim Crow South Florida, but was the very axiom buttressing the region’s envirotechnical and economic development. In the “Magic City”—as boosters christened the region in the late nineteenth and early twentieth centuries—Black, brown, and poor folks were needed as laborers at contemporarily high-tech beachfront resorts and casinos, but their presence had to be limited to these service positions. Black people especially could not visit, let alone live, near these beaches and spaces reserved for white entrepreneurship and leisure. Their neighborhoods were pushed inland and on slightly higher geological plateaus, the wild coastline having been reclaimed by white tycoons as an exclusive environment for white pleasure. Thus, these patterns ultimately laid the foundation for the envirotechnical, and now climate vulnerable, landscape of twenty-first century South

⁹⁶ See Kahrl, “Warning: Black People at Leisure,” Kahrl, *Free the Beaches* and Bush, *White Sand Black Beach*.

Florida.⁹⁷ Miami's social geography has concretized and endured, as exemplified by the city's historically Black neighborhoods inland and the coast's continued notoriety as a playground for the rich. The proceeding analysis weaves South Florida's particular geological and environmental formations—its limestone foundation, stubby plateaus, and subtropical beaches—together with the development of its twentieth-century racialized socioeconomic and concrete infrastructure.

I then combine oral history, original archival work, and a survey of secondary literature to explore antecedents of the climate justice movement, including those Black organizers who resisted white environmental domination between 1940 and 1963. As we will see, Reeves' Crandon Park protest was only one of a series of critical political actions that Black communities took to attempt to break the most obviously harmful aspect of South Florida's "Magic City" political-economic structure between the 1940s and 1970s: that of environmental deprivation.⁹⁸

Building these analyses together and understanding the conceptual arch connecting Chapters 2 and 3 requires paying attention to a racialized topography, or how the "Magic City" landscape reified racial categories and structures of political-economic power and then inscribed them into South Florida's environment. White and Black people's proximity to natural landscapes and to each other became defined by the "Magic City" political-economy. Understanding racial topographies means identifying where processes of racialization (i.e. the *in-situ* meaning of "whiteness" and "Blackness" pertinent to this study) meet the geological time

⁹⁷ Pritchard, *Confluence*.

⁹⁸ The American Psychological Association defines environmental deprivation as "an absence of environmental conditions that stimulate intellectual and behavioral development, such as educational, recreational, and social opportunities." From the early-1980s to the present, scholars from a variety of disciplines have detailed the causes and effects of racist environmental pollution in the U.S.; from Robert Bullard's foundational text *Dumping in Dixie* to Harriet Washington's *A Terrible Thing to Waste*. Environmental deprivation builds from these efforts to show how denying marginalized groups clean and welcoming natural spaces for recreation is also a form of environmental racism.

of Florida’s beaches, where apartheid concrete walls bound “bad” neighborhoods from “good” neighborhoods, where the human need for communing with more-than-human nature (i.e. going to the beach to tan, swim, and play) meets an infrastructure of naturalized inequality, and where a city built around beach vacationing below sea level meets its future of a rising ocean.

These Black environmental histories of Miami are foundational to this dissertation’s central argument: that climate predictions are more than their scientific origins; that climate knowledge is built from multiple angles and from various sources, and made meaningful at the local level. Knowing these histories of environmental segregation is critical for understanding contemporary climate politics and the problematic nature of mainstream responses to climate change. *They are climate knowledge, too.* They are used contemporarily to critique the vanguard of resilience who envision remaking Miami into a green twenty-first century, high-tech Magic City without asking whom this benefits and what communities may end up living in its shadow to bear the brunt of social climate impacts. Essentially, they help us “know well,” as Donna Haraway says, so that we care, and that is how responsibility grows.”⁹⁹

Constructing the “Magic City” (1880s-1940s)

A Miamian might tell you, “the farther north you go the more south you are” when describing the state of Florida, alluding to the great rift between the liberal urban elite of Miami in South Florida and the Ku Klux Klan territories of northern Florida, such as Gainesville and Tallahassee.¹⁰⁰ While it’s true that north and south Florida differ in culture and political orientation in some significant measure, white South Floridians might be surprised to learn the

⁹⁹ Haraway, *When Species Meet*, 287.

¹⁰⁰ Mohl, *South of the South*; “Hate Groups,” *Southern Poverty Law Center*, 2020, <https://www.splcenter.org/hate-map>

extent of anti-Black segregation's entrenchment in their region and how its concrete legacies have endured in their hometowns.¹⁰¹

From 1880 to 1980, white people and foreign investors reclaimed and, therein, claimed ownership over the beaches, green spaces, and best vistas for their beachfront properties along Florida's coast. Federal law facilitated this environmental white supremacy via the "separate but equal" *Plessy v. Ferguson* ruling in 1896. Along the coast, state-sponsored segregation worked to the benefit of opportunistic northern white elites seeking to monopolize on the southern peninsula's natural wonders. These moguls sought to create a luxurious, tropical vacation paradise for white consumers at a period of time when beach-going was quickly becoming a staple among wealthy and middle-class vacationers along the northeastern coast and Great Lakes region, and did so by mobilizing a Black labor force that was then kept at a distance from these same beaches they helped construct.¹⁰² These founding entrepreneurs helped turn Miami into the "Magic City," and opened up the rest of South Florida's coast to its racialized political-economic and concrete infrastructure. Yet, while law and culture tightened enforcement on Black, brown, and poor peoples' allowable proximities to the ocean, as Andrew W. Kahrl (2012) explains, "the construction and enforcement of racial and class privilege and segregation" propagated through

¹⁰¹ In this section, I work with archival materials from the 1880s through the 1970s garnered from, Florida Memory State Library and Archives, The Historic Lyric Theater's Black Archives in Miami, FIU's Wolfsonian Library, and a few other smaller museum collections. I also provide oral histories, detailed below, as original contributions. To afford my reader some historical guideposts, this means I first analyze materials referencing the period of legal segregation after *Plessy v. Ferguson* and prior to the *brown v. Board* decision between 1880 and 1940s, then move chronologically toward the period of integration and the beginning and end of the Civil Rights movement, sometimes marked as existing between 1954 -1968, and then jump ahead to Miami in the 1970s. While I draw from original research, my work is also built from secondary sources, specifically Raymond A. Mohl (2001, 2003), N. D. B. Connolly (2016), Gregory W. Bush (2016), Chanelle N. Rose (2015), and Andrew Krhal's (2012, 2018) brilliant scholarship detailing the practice of redlining, Black segregated beaches in Miami, and the historic fight for equality of public spaces and housing in the U.S. more generally.

¹⁰² Rozwadowski, "Playing By—and On and Under—the Sea."

“space and the built environment” as well.¹⁰³ How exactly, then, was Miami’s racial topography built to sustain the “Magic City” of an elite, whites-only business and vacation paradise?

We must first begin with the peninsula’s general political, economic, and infrastructural development, and its attendant growth, between 1892 and 1912. This was when a public-private nexus of Florida politicians, federal agencies, and northern millionaire prospectors began in earnest to transform South Florida’s massive central swampland, its marginal cities, its independent settlers, and scruffy beaches into profitable spaces for real estate, agriculture, and tourism.

Henry Flagler and the Florida East Coast Railway: 1892-1912

In the 1880s Henry Flagler, co-founder of Standard Oil of New York City, turned his ambitions south to Florida. He was attracted to St. Augustine’s salty air on the northeast coast of the peninsula on his first visit, and noticed a dearth of acceptable hotel accommodations. He immediately worked to fill this market opening, beginning to build a culture around summering in Florida for white elites like himself.¹⁰⁴ Flagler is mostly remembered for constructing the Florida East Coast Railway (FECR), and specifically for his dogged attempts to send its tracks over the waters separating the mainland and the Florida Keys. The history of the FECR’s impressive engineering, however, often overshadows Flagler’s original intention, which was to turn Florida’s untamed east coast into a beach-going tourist monopoly. In 1885, he simultaneously began building the Mediterranean-style Hotel Ponce De Leon beach resort in St. Augustine while purchasing local railways, having enough business acumen to know that

¹⁰³ Kahrl, *The Land Was Ours*, 16.

¹⁰⁴ Standiford, *Last Train to Paradise*, 45.

Florida's underdeveloped transportation system stood in the way of his new tourism venture and enough wealth as one of the country's first billionaires to make sure it wouldn't.

St. Augustine was a northern Floridian beach township sitting just south of Jacksonville, which was the most populated city in the state at the time. Three hundred miles south, down the long neck of the peninsula, a widespread small population of a few hundred white settlers occupied Biscayne Bay county, or what is known today as Miami-Dade County. According to a 1937 Historical Records and State Archives Survey, the 1890 census counted only "861 (whites)" with, tellingly, no data for Black or Native Seminole populations. However, we can assume these populations were relatively robust. By the 1830s, after the U.S. purchased the peninsula from Spain, the territory was opened more widely to white plantation owners for colonization who brought hundreds of the Black people they enslaved with them.¹⁰⁵ The Native Seminoles fought against this U.S. advancement into South Florida to the extent that the U.S. Army was sent into the Biscayne Bay area to protect these white plantation owners from attacks and to push the Seminoles deep into the Everglades. At this time, South Florida's own version of an underground railroad had developed as Black folks escaped and found safe passage to the British owned Bahamas, where slavery had already been decreed illegal in 1834. Additionally, the northern and interior Everglades, which continued to elude many white colonists as an utterly unnavigable swampland, was already established as a territory where Black folks could scratch out a living after escaping slavery, perhaps in friendly relation with supportive Seminole populations.¹⁰⁶ We do know that at least 162 Black men lived in the Biscayne area by 1896, as

¹⁰⁵ For a detailed history of eighteenth-century Floridian slave plantations, and the complex Seminole and African relations that resulted see, Riordan, "Finding Freedom in Florida."

¹⁰⁶ Relationships among Seminoles and escaped Black folks were sometimes deeply cooperative but often tenuous, being historically dependent on the political climate between the Seminoles and the imperialist powers. See Riordan, "Finding Freedom in Florida."

Miami's official incorporation that year depended entirely on the cooperation of the town's Black male voting age population. Nearly half of the required 300 signatories who ratified Miami into existence were Black men, many of whom worked to build Flagler's beach resort empire.¹⁰⁷

However, in 1890, the area of Biscayne Bay was deemed so under-inhabited, the county seat had to be moved to Juno (near today's Palm Beach), which was the most active commercial port connecting Florida's white settler agricultural economy to northern consumers at the time. Biscayne Bay county was considered "primitive," an underdeveloped backwoods. As the 1937 survey explains, "water...provided the only means of communication (there was no appropriation made for roads in Dade county until 1900)...The beach provided a footpath for those without boats. Walking the beach from Palm Beach to Miami (about 75 miles) was common practice up to 1895.'"¹⁰⁸ Legislators met on the front porches of private residences to speak on official business and mail carriers walked the length of the beach once a month to make deliveries.

Only in 1900 did what became Dade county take up issuing bonds to finally pay for sustainable city infrastructure, like roads, a county courthouse, and a jail. "Usable section-line roads," the survey explains, "had been made by levelling native coral rock [or limestone], dug from quarries, but many more were needed, and all needed to be tarred and black-surfaced."¹⁰⁹ The survey's author then also provides a colloquial, pre-Progressive Era explanation for why locals called the area the "Magic City," writing, "it derived a name of 'Magic City' not so much from its rapid growth as the effect, in the moonlight, of its streams of white [limestone] roads,

¹⁰⁷ N. D. B. Connolly notes, however, Florida's incorporation as a state in 1845 into the union depended entirely on the count of fifty thousand white people, as people of color did not count as part of the union's population. See Connolly, *A World More Concrete*, 19-20.

¹⁰⁸ Natalie Newell, "Historical Records and State Archives Surveys History of Dade County Government," *Florida Memory*, 1937, 2.

¹⁰⁹ *Ibid.*, 7.

white roof tops, and silvered foliage and waters,” that shone at night prior to the county’s intensified development efforts.¹¹⁰

Between 1890 and 1902, this more colloquial take on the ruggedly independent, backwoods “Magic City” would soon be supplanted by an image of Miami as a primitive landscape at last conquered by shrewd inventors, businessmen, Progressive Era technology, and a booming beach economy for white elites, or what became the twentieth-century “Magic City.” Dade County’s demographics, natural environments, and socio-spatial arrangements would change dramatically as Flagler’s Florida East Coast Railway (FECR) purchased existing rails and built new tracks to stretch his beach vacation empire all the way down to Biscayne Bay, and eventually to Key West in 1912. The railway facilitated a rapidly expanding “snow-bird” tourist economy and Flagler aimed to transform each major point along the FECR into a beach resort landscape attractive to northern white tourists.¹¹¹ “The extension of the railway in 1895-96,” the 1937 historical survey quoted above continues, “was no doubt the misfortune of Juno and the fortune of Miami...With the railway, Miami became the point of contact with all the South Americas and intervening islands. Miami emerged from its adolescence like a boy coming of age in twenty-one years,” becoming “well known as the ‘winter playground of the nation’ by 1910.”¹¹²

¹¹⁰ Ibid., 7.

¹¹¹ Two other local white wealthy families, the Tuttle and the Brickell, are often popularly credited with Miami’s construction as a modern city. These families are equally embedded in local memory with streets and neighborhoods given their namesake.

¹¹² Natalie Newell, “Historical Records and State Archives Surveys History of Dade County Government,” *Florida Memory*, 1937, 8.

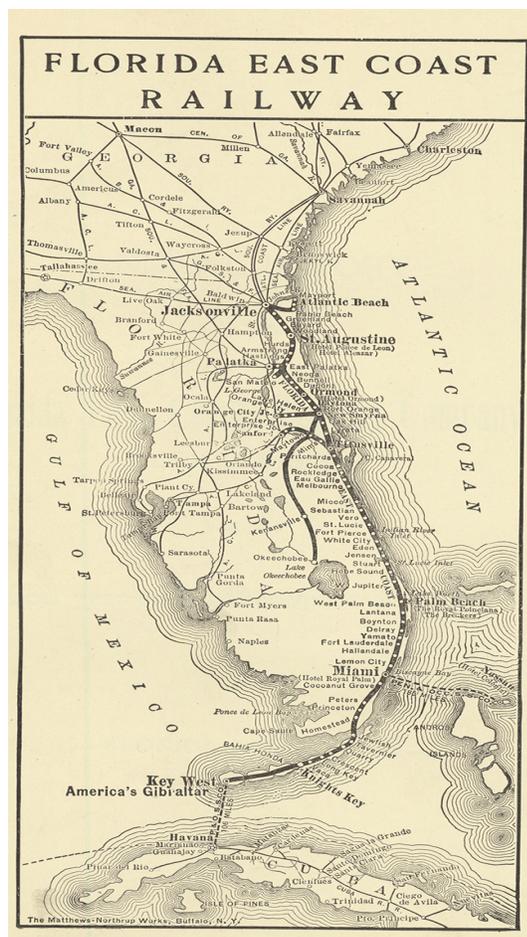


Figure 2.1. Florida East Coast Railway Map 1917, Courtesy of Florida Memory State Library and Archives.

The railway is often romantically narrated in local popular histories as a kind of civil service provided by a lone, self-made billionaire. In a Palm Beach museum dedicated to his legacy, archivists have written that, because he “single-handedly” constructed the beach tourist industry, “in essence, Henry Flagler invented modern Florida.”¹¹³ In reality, the FECR followed the timeline and path of Flagler’s growing waterfront resort portfolio, which grew in tandem with his real estate and agricultural investments in the state. In St. Augustine, Hotel Ponce De Leon

¹¹³ Henry Morrison Flagler Museum, “Florida East Coast Railway,” <https://www.flaglermuseum.us/history/florida-east-coast-railway>.

broke ground in 1885 followed shortly after by the resort casino Hotel Alcazar in 1889. He also purchased the Hotel Cordova in St. Augustine in 1888. But Flagler's ambitions stretched all the way down the coast to Biscayne Bay. He knew early on he wanted to recreate the monopoly of Standard Oil across Florida's coastline. A new resort would be designed and commissioned within a few short years from the ground up or purchased to be added to a growing collection, and the FECR would concomitantly extend the railroad's distance to meet the new property, over rivers and past orange groves, whisking guests away to their vacations in tropical paradise. He purchased Hotel Ormond in the beach town of Ormond City 30 miles south of St. Augustine in 1890. The Hotel Royal Poinciana, built slightly inland along Lake Worth, completed construction in 1894, followed by Hotel Royal Palm in Miami in 1897, the year following the FECR's completion into Biscayne in 1896. In 1901, Flagler also purchased The Breakers Hotel in today's Palm Beach while completing construction on the Hotel Continental in Jacksonville.



Figure 2.2 Guests of the Royal Poinciana stand in front of the hotel train (1896). Courtesy of Florida Memory State Library and Archives.

If the hagiographies about Henry Flagler are at all true—that “he was the only man in American history who initiated and carried to completion such an extensive development program out of his own personal fortune”—it must have cost him millions to venture into this vast, modern empire so intensely and so quickly.¹¹⁴ However much he personally invested though, he saved on labor costs through mass convict leasing and peonage, or debt systems which lured in and trapped new immigrants.¹¹⁵ Poor Black and white settlers flocked to Florida for the growing opportunities advertised, imagining stable construction jobs and homeownership within their sites in budding Flagler towns.¹¹⁶ By 1902 Dade County’s population had jumped to around 5,000 (whether or not this census counted Black and Native folks, I cannot say).¹¹⁷ However, Black and white convicts were also leased by the hundreds to construct the FECR up and down the coast with essentially all the conditions of slavery intact.

Important to note, Florida was a southern state without exemption from the brutalities of the post-Reconstruction, Jim Crow south. Convict leasing proved to be one of the most powerful means of controlling the free movement of recently un-enslaved Black people. “Black Codes,” officially ratified as well as culturally produced and policed, made purposefully unrealistic stipulations on the lives of Black people, and if those expectations were not met, criminal imprisonment followed suit. The system was in part created to meet a dearth of labor for the

¹¹⁴ Corliss, “Henry M. Flagler: Railroad Builder,” 195-205.

¹¹⁵ Knetsch, “The Peonage Controversy and the Florida East Coast Railway.”

¹¹⁶ Connolly, *A World More Concrete*.

¹¹⁷ Natalie Newell, “Historical Records and State Archives Surveys History of Dade County Government,” *Florida Memory*, 1937, 9.

industries of white elites. After all, with slavery abolished, how were new economies to expand in the Gilded Age? Michelle Alexander informs us that, “Nine Southern states adopted vagrancy laws—which essentially made it a criminal offense not to work and were applied selectively to Blacks—and eight of those states enacted convict laws allowing for the hiring-out of county prisoners to plantation owners and private companies. Prisoners were forced to work for little or no pay.”¹¹⁸ Florida was one of these eight states; the FECR was one of these private companies.¹¹⁹ It may, therefore, be reasonable speculation to assume that many of these leased convicts represented disproportionately Black prisoner populations.

Figures 2.3 and 2.4 depict Black free laborers breaking ground on Flagler’s South Beach Royal Palm Hotel under the supervision of their white overseer, John Sewell. Sewell, Flagler’s right hand man, originally selected a crew of 12 which he called his “black artillery,” a team instructed to clear away what was left of the Native Tequesta burial mound and begin to lay the foundations for the luxury beach resort. Black Caribbean and African American free laborers shoveled and hammered with calloused hands, and pushed wheelbarrows of nutrient rich mud and sand along the beach, to carefully construct these entertainment destinations for white people to enjoy.

¹¹⁸ Alexander, *The New Jim Crow*, 28.

¹¹⁹ While vagrancy laws were built to specifically target people of color in the south, poor white men and their families also suffered greatly at the hands of East Coast Railway forced work camps. Popular journalist Richard Barry wrote specifically about the apparent horrors he saw during the Florida East Coast railway construction, stating “In a new and sinister guise slavery has again reared its hideous head, a monster suddenly emerging from the slimy, sordid depths of an inferno peopled by brutes and taskmasters in human semblance. Whites and Blacks are today being held indiscriminately as chattel slaves, and the manacle, lash, bloodhound and bullet are teaching them submission without partiality to color.” See Richard Barry, “Slavery in the South Today,” *Los Angeles Herald*, June 1909, <https://cdnc.ucr.edu/cgi-bin/cdnc?a=d&d=LAH19090616.2.92.68&e=-----en--20--1--txt-txIN-----1>.



Figure 2.3 1896, Twelve black laborers break ground with white construction overseers looking on. The Brickell family's estate sits in the background. Courtesy of Florida Memory State Library and Archives of Florida.



Figure 2.4 1896, John Sewell's "black artillery" cleared away what remained of the Native Tequesta burial ground to lay foundations for the Royal Palm Hotel on South Beach. Courtesy of Florida Memory State Library and Archives of Florida.



Figure 2.5 1896, The arrival of the FECR's first passenger train in Miami.

By this time boosters for Florida tourism and agricultural development were heralding Miami into the new century as the “Magic City.” A key conceptual feature of this twentieth-century “Magic City” imaginary was the break-neck speed with which tycoons like Flagler were able to construct their technologically advanced empires and consolidate political and economic power. Flagler’s barreling trains replaced the “horny footed” mailmen slogging along the beaches as well as the canoe rides up and down the swamp.¹²⁰ The “Magic City” instead came to embody, what David E. Nye calls, the “American technological sublime.”¹²¹ In his book of the same name, Nye first describes the sublime through the Transcendentalist tradition and its focus on the power of nature, invoking Henry David Thoreau’s veneration of awesome forest landscapes, for example. Nye then proceeds to explain how this natural sublimity popularized by poets in the early nineteenth century was blasted through and built over

¹²⁰ Natalie Newell, “Historical Records and State Archives Surveys History of Dade County Government,” *Florida Memory*, 1937, 7.

¹²¹ Nye, *American Technological Sublime*.

by the industrial boom of the Gilded Age and the Progressive Era, detailing how massive infrastructural growth built by rapidly advancing engineering techniques amounted to a nation-building spectacle, bringing forward a new facet of a particularly American identity. Railroads played a singular role during this process.¹²²

In the context of South Florida, Flagler's trains and luxury resorts inscribed the technological sublime into South Florida's developing envirotechnical landscape and, more specifically, allowed visitors to directly participate in and reproduce this new facet of national identity. The Poinciana and Royal Palm resorts offered indoor plumbing and telephone systems, amenities elites would come to expect of luxury accommodations. Additionally, Miami was no longer only alight by the moon anymore, but aglow with electric wiring.

The "Magic City's" technological sublime was then certainly reinforced by the state's simultaneous efforts to engineer land out of water by draining an entire peninsula's swamplands, a gargantuan envirotechnical project meant to push Florida's political economy onto the international stage and inspire the country's awe.¹²³ While the political infrastructure for draining Florida's massive Everglades ecology burgeoned under Governor William Sherman Jennings' tenure in 1901, it was Governor Napoleon Bonaparte Broward (1905-1909) who made good on his 1904 campaign promise to turn the "Everglades into an Empire." His administration pushed Floridian agriculture as an untapped market that lay waiting across an open and uncultivated landscape. But first, land had to be created. Under the Swampland Act of 1850, any swamp a man could "reclaim," or drain and bring to bear for civilizational use, would come under their ownership. Broward selected Jennings, his predecessor, to lead the state's Internal Improvement

¹²² Ibid., 45-76.

¹²³ Ogden, *Swamplife*; Pritchard, *Confluence*, 1.

Fund as General Counsel, which was redesigned to funnel state money directly to private investors interested in turning swamp into viable real estate or farmland. Broward offered acreage at exceedingly low cost to draw in wealthy white northern investors, and they flocked. When faster trains began crossing the length of the state at a quicker clip, even more perfectly straight rows of tender citrus cropped up across its flat, wet middle. So abundant and so handsomely perfumed, they named the orange blossom Florida's state flower in 1909.

It wasn't until the 1920s, however, that the U.S. Army Corps of Engineers halted the flow of Everglades water entirely at its head in Lake Okeechobee. These efforts required hacking through needle sharp sawgrass to dig enormously long canals for sending water in directions it had never flowed before.¹²⁴ As the Corps drained areas and installed levees and dikes, new bare real estate and fecund farmland emerged, with rich black soils made from thousands of years of decomposing vegetation. Modern men, inventors and investors like Flagler and Broward, were turning a "primitive" and "deserted" landscape into an engineered environment and spectacle of progress.

Arguably, the "Magic" of the "Magic City" also invoked an *envirotechnical* sublime—Miami's beachfront experience marrying awe-inspiring technology and transcendental nature across a hybrid landscape. Great earth tilling engineering and Progressive Era social planning mixed fluidly with the vast Atlantic Ocean and an "exotic," if tamed, wilderness.

¹²⁴ McPhee, *The Control of Nature*.

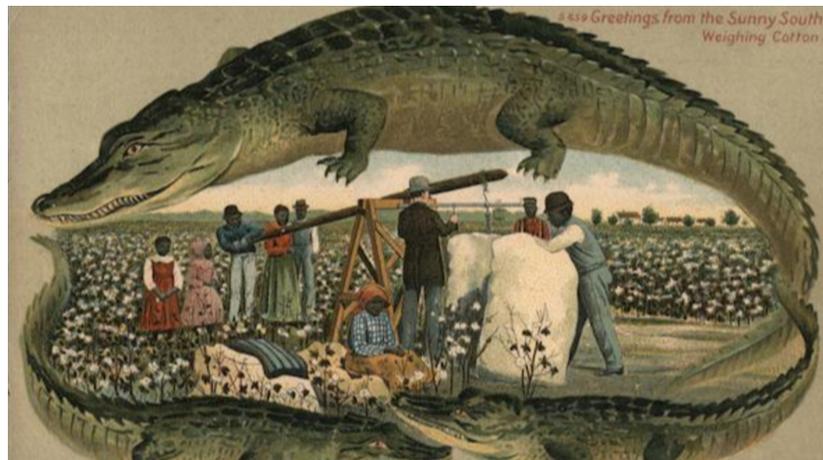


Figure 2.6. (top) is a postcard depicting Miami’s Royal Palm Hotel printed by a German company called Samuel Landsdorf and Co. between 1906-1918. Figure 2.7. (bottom) is a postcard printed by the same company and depicts an imagined scene where Black laborers weigh cotton in front of a white overseer. The alligator rim became a signature feature for the company.

Yet, the “Magic City” also provides an addendum to Nye’s historical concept in at least one way. South Florida’s technological advancement via trains and reclamation could be appreciated by all spectators and Floridians, but to actively participate in the beach-resort sublime between 1896 and 1970, one had to be white—wealthy, or at least middle-class, but

certainly white. Black free laborers were hired and Black prisoners conscripted through leasing (alongside poor whites and immigrants). They could work to build the envirotechnical sublime beach landscape, and then later work inside its buildings in service positions, but their full participation or unmanaged presence on the beach would otherwise have been antithetical to the experience of whiteness being crafted for the tourist city of Miami. Most African American and Black Caribbean folks lived in segregated Colortown and Lemon City where a “Black Broadway” and “millionaires row” would develop in tandem with the beach’s successful reclamation, but at a calculated distance from the shoreline, inland and on slightly higher ground.¹²⁵ Consequently, the envirotechnical sublime helped reify racialized identities, building whiteness and blackness into South Florida’s urban and natural topography.

The “Magic City” as a white environment: 1915-1926

Miami became a world-renowned attraction, but drew in white North Americans in particular, offering an escape from the grey skies and sub-zero temperatures of dismal winters. In 1914, billionaire James Deering of the Chicago based Deering-McCormick International Harvester corporation followed his family down to Florida. He employed a team of Black men from the Bahamas to build a luxury estate on the water of Biscayne Bay that would rival the Palace of Versailles.¹²⁶ Ten acres of tangled jungle, wet sand, and limestone were converted by Black Caribbean workers into one of the most elaborate, European-inspired gardens found in the continental Americas. The private estate, known today as the Viscaya Gardens museum, looks directly out onto the bay. It included, as illustrated by Figure 2.8, a to-scale alabaster concrete

¹²⁵ A small notable Black enclave closer to the beach were the Bahamian immigrants living in Coconut Grove. See Mohl, “Black Immigrants.”

¹²⁶ Viscaya Gardens Museum, <https://vizcaya.org/stories-of-vizcaya/?category=history-of-vizcaya>.

ship sculpted with mermaids, accessible by a gondola pushed by a butler. Deering and his friends frequently wined, dined, and splashed around in the waters around “the Barge,” as it was called, trading the blistering cold of the “Windy City” for the warmth of the “Magic City.”



Figure 2.8. “The Barge,” 1917. The backyard of Deerings estate looked out onto Biscayne Bay. He commissioned a concrete boat to scale, where he and his guests could wine, dine, and play in the water. Courtesy of Vizcaya Museum and Gardens.

South Florida’s posturing as a state of permanent beach vacation also attracted the attention of Carl G. Fisher, founder of the Indianapolis 500. Fisher reveled in Miami Beach’s boating culture, taking particular pleasure in racing speed boats powered by powerful combustion engines fitted to the task. He built his own hotel in 1920—the Flamingo Hotel on Biscayne Bay—and even wrote a promotional brochure for South Florida titled *A Little Journey to Altonia: the Lure of a Clockless Land Where Summer Basks in the Lap of Winter* to draw in other tourists with the dream of watching the regattas in the sun-drenched sand.¹²⁷ The fact these resorts and activities were reserved for building up white identity in Progressive Era South

¹²⁷ Wolfsonian FIU Library, “Then and Now: South Florida’s Love Affair with Yachts and Boating Culled from the Wolfsonian Fiu Library Collection,” February 13, 2013, <https://wolfsonianfiulibrary.wordpress.com/2013/02/13/then-and-now-south-floridas-love-affair-with-yachts-and-boating-culled-from-the-wolfsonian-fiu-library-collection/>.

Florida is most shockingly articulated by Fisher himself in a note to a friend, cited in N.B. D. Connolly. In the note, Fisher describes how he imagined employing Black workers to steer gondolas for his Fisher’s Nautilus Hotel on Miami Beach, and that these workers would be “stripped to the waist,” “wear big brass rings” and “possibly necklaces of live crabs and crawfish.”¹²⁸



Figure 2.9. An advertisement for Fort Lauderdale beach Courtesy of The Wolfsonian Library at FIU.¹²⁹

The Dixie Highway’s completion in 1910 created a flow of traffic running north to south a few miles inland, opening up South Florida vacations up to a range of white middle-class pleasure seekers. If not staying in a mid-priced beach resort, families could pitch a tent in a

¹²⁸ Connolly, *A World More Concrete*, 23.

¹²⁹ Wolfsonian FIU Library, “Then and Now: South Florida’s Love Affair with Yachts and Boating Culled from the Wolfsonian Fiu Library Collection,” February 13, 2013, <https://wolfsonianfiulibrary.wordpress.com/2013/02/13/then-and-now-south-floridas-love-affair-with-yachts-and-boating-culled-from-the-wolfsonian-fiu-library-collection/>.

designated tourist court, which was popular at this time. In fact, a tourist court called “the Magic City Park” was constructed in 1929 to meet the needs of this ever-growing beach-going population. It consisted of cabins with individual kitchens and toilets, and was located in Lemon City (a section of today’s Little Haiti).

Between 1910 and the 1940s the “Magic City” thus became a vacation paradise also accessible to middle-class whites, who in turn constructed and reified a new facet of white identity by the glow of the envirotechnical sublime, by the sunshine on the beach and the bright lights of the Miami Beach casinos. Following scholars studying the construction of racial identity, such as Stuart Hall, we can see whiteness as a shifting identity category defined by access to power and buttressed by a larger integrated caste system.¹³⁰ Or, as Geoff Zylstra describes, whiteness is a “strategy of authority that exercises power through the creation of privileges and advantages,” rather than a determined set of phenotypic traits or connection to heritage.¹³¹ In early to mid-twentieth-century Miami, whiteness became, in part, defined by a light skinned person’s relationship to the local environment, or their entitlement to and authority over South Florida’s beautiful landscapes. Being able to safely and recreationally access Miami’s beaches and its entrepreneurial, tech-driven amenities was a marker of whiteness. For instance, Figure 2.9 demonstrates a typical advertisement Florida boosters used in the 1920s and 1930s to attract white northerners to the coastline.¹³² The ad frames Fort Lauderdale—a relatively young city 29 miles north of Miami, trying to carve out its own market niche—as “The Tropical

¹³⁰ Hall, “Race, The Floating Signifier.”

¹³¹ Zylstra, “Whiteness, Freedom, and Technology.”

¹³² Wolfsonian FIU Library, “Then and Now: South Florida’s Love Affair with Yachts and Boating Culled from the Wolfsonian Fiu Library Collection,” February 13, 2013, <https://wolfsonianfiulibrary.wordpress.com/2013/02/13/then-and-now-south-floridas-love-affair-with-yachts-and-boating-culled-from-the-wolfsonian-fiu-library-collection/>.

Wonderland,” featuring speed boats as recreational technology. Note the white man at the forefront of the vanishing point in the drawing wearing a green jacket: he has gotten out of his car to take in the modern scene. Perhaps, catching the churning white wakes of the motorboats from the corner of his eye, he couldn’t help but pull over to see for himself. He’s accompanied by white onlookers in bathing suits sitting under the gentle shade of coconut palms, also marveling at the envirotechnical sublime.

These advertisements communicated to their audiences that there was something special about South Florida that one could not readily find elsewhere. With its towering casinos and roaring speedboats, the east coast of the peninsula was marketed as an indulgent, otherworldly tropical playground in America’s backyard. Importantly, though, it was a tropical place without the “polluting” presence of too many dark, tropical people, yet with all of the modern technological accoutrements and toys monopoly money could buy. These ads thus sold northerners the envirotechnical sublime of the “Magic City” and a facet of an evolving white, national identity.

As a point of contrast, U.S. National Parks burgeoned at this time as environments for cultivating a white middle-class national identity through communion with nature.¹³³ However, national parks like Yosemite and Yellowstone offered opportunities to embody the ideal of rugged individualism, to rough it in an “untouched” landscape at its most transcendent. This was leisure, but leisure meant to restore “a sense of national identity and individual well-being.” “In the wild,” geographer Terrance Young explains, “campers were supposed to collectively or individually discover or restore such American ideals as freedom, community, democracy,

¹³³ On this topic see White, *The Organic Machine*; Cronon, ed., *Uncommon Ground*; Spence, *Dispossessing the Wilderness*; Nash, Frazier, and Miller, *Wilderness and the American Mind*.

self-reliance and self-confidence by ‘roughing-it’ in a mobile social order reminiscent of the pioneers.”¹³⁴

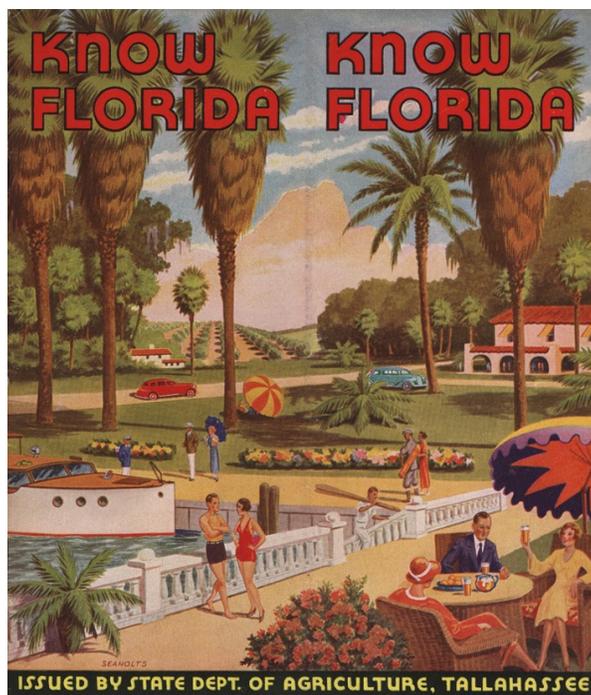


Figure 2.10 an advertisement issued by the state Department of Agriculture circa 1925 Courtesy of The Wolfsonian Library at FIU.¹³⁵

The “Magic City,” on the other hand, offered something quite different. The peninsula was a “wasted” swampland totally transformed by the white entrepreneur's colonizing, technologically advanced ingenuity—“reclaimed” by machine and exquisite design. What's more, it was a space to play, to be entertained, to relax the body and ease the mind. Flashy casinos enticed one to flirt with risk, while boats docked at the pier waited for those trying their hand at waterskiing. The city and its business owners auspiciously worked, not only the angle of

¹³⁴ Young, “A Contradiction in Democratic Government.” (Young also explains that Black folks were expected to abstain from such leisure and nationalism here as well.)

¹³⁵ Wolfsonian FIU Library. “Then and Now: South Florida’s Love Affair with Yachts and Boating Culled from the Wolfsonian Fiu Library Collection.” February 13, 2013. Accessed June 07, 2021: <https://wolfsonianfiulibrary.wordpress.com/2013/02/13/then-and-now-south-floridas-love-affair-with-yachts-and-boating-culled-from-the-wolfsonian-fiu-library-collection/>

paradise, but also a different kind of reflection and reproduction of whiteness informed by the technological sublime.¹³⁶ The ad not only entreat the white collared northerner to take a break from the office and escape the wintery north. It also presents them a crafted and controlled beach vacation experience, perfected by enhancement, with extraordinary entertainment and relaxation exclusive to white folks like them. This was a new way of vacationing, for some. Figure 2.10 commands the reader to “Know Florida.” As the image depicts, to “know Florida” means being outside, poolside, among the greenery, playing, flirting and drinking. It’s a manicured outdoor party, for whites only.

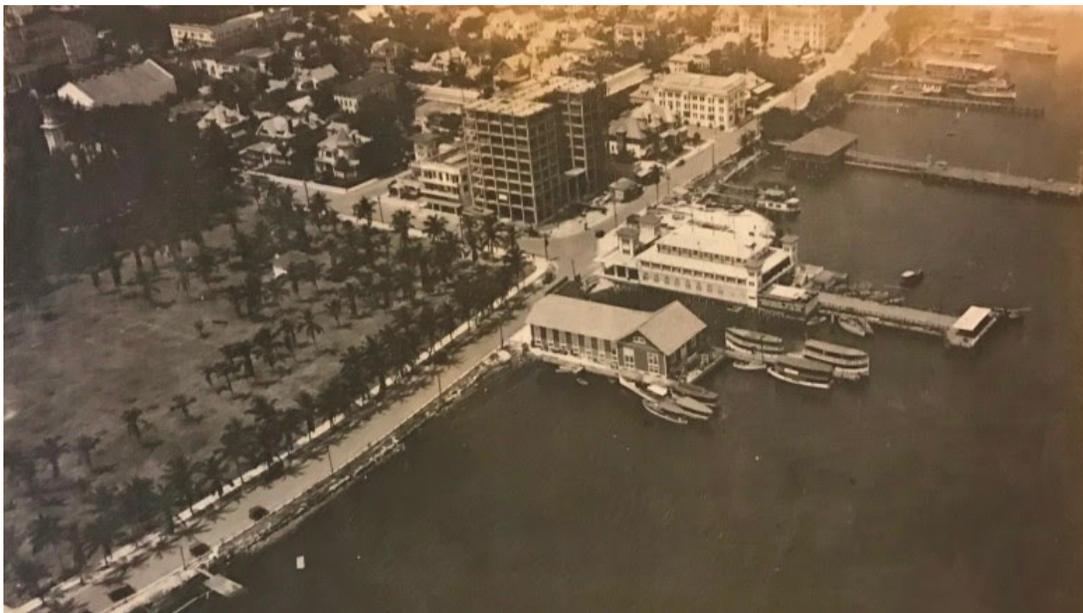


Figure 2.11. Elser Pier, 1917.

Elser’s Pier’s short lived history sharpens this point. In 1916 a wealthy northern oil stock trader named Maxwell Elser found Miami’s climate and tourist economy so favorable, he acquired the necessary rights from the city to build a convention center and entertainment

¹³⁶ Nye, *American Technological Sublime*.

complex attached to a pier, stretching 400 hundred feet headlong into Biscayne Bay.¹³⁷ From 1917 when construction was completed to 1924 when the city claimed eminent domain and condemned the property, business thrived. Folks could stroll the sunny pier, play carnival arcade games, and learn about sea creatures in one of Miami's first aquariums. As a collection presented by *Miami History* articulates, "For ten years, Elser Pier provided a venue to exhibit all the technological wonders of the day. In many ways, the building was a technological marvel itself and served as an omen that the city was modernizing very quickly."¹³⁸ Papers advertised the slogan, "Meet me at Elser Pier."

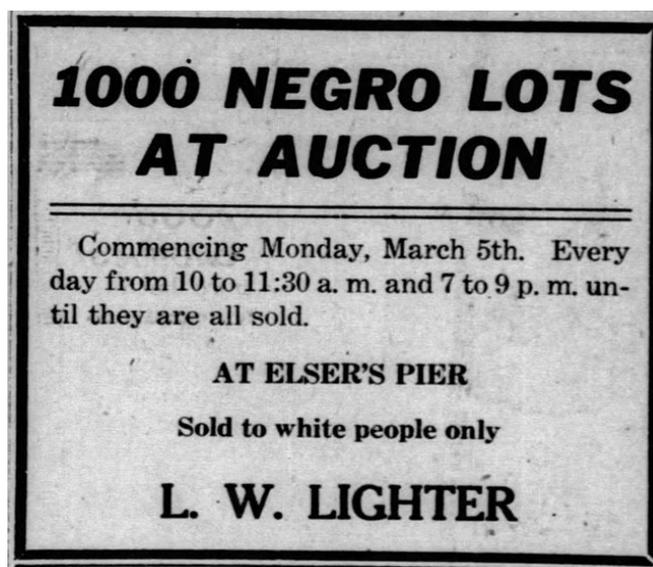


Figure 2.12. An Elser Pier convention advertisement, 1917.

Figure 2.12. makes clear exactly what kind of modern Miamian met at the pier and the kinds of business they promoted. The image is an advertisement for a lot auction to take place March 5, 1917 in the pier's convention center. It reads "1,000 negro lots at auction...At Elser's Pier...Sold to white people only." In all likelihood it was a gorgeous sunny day, March being well

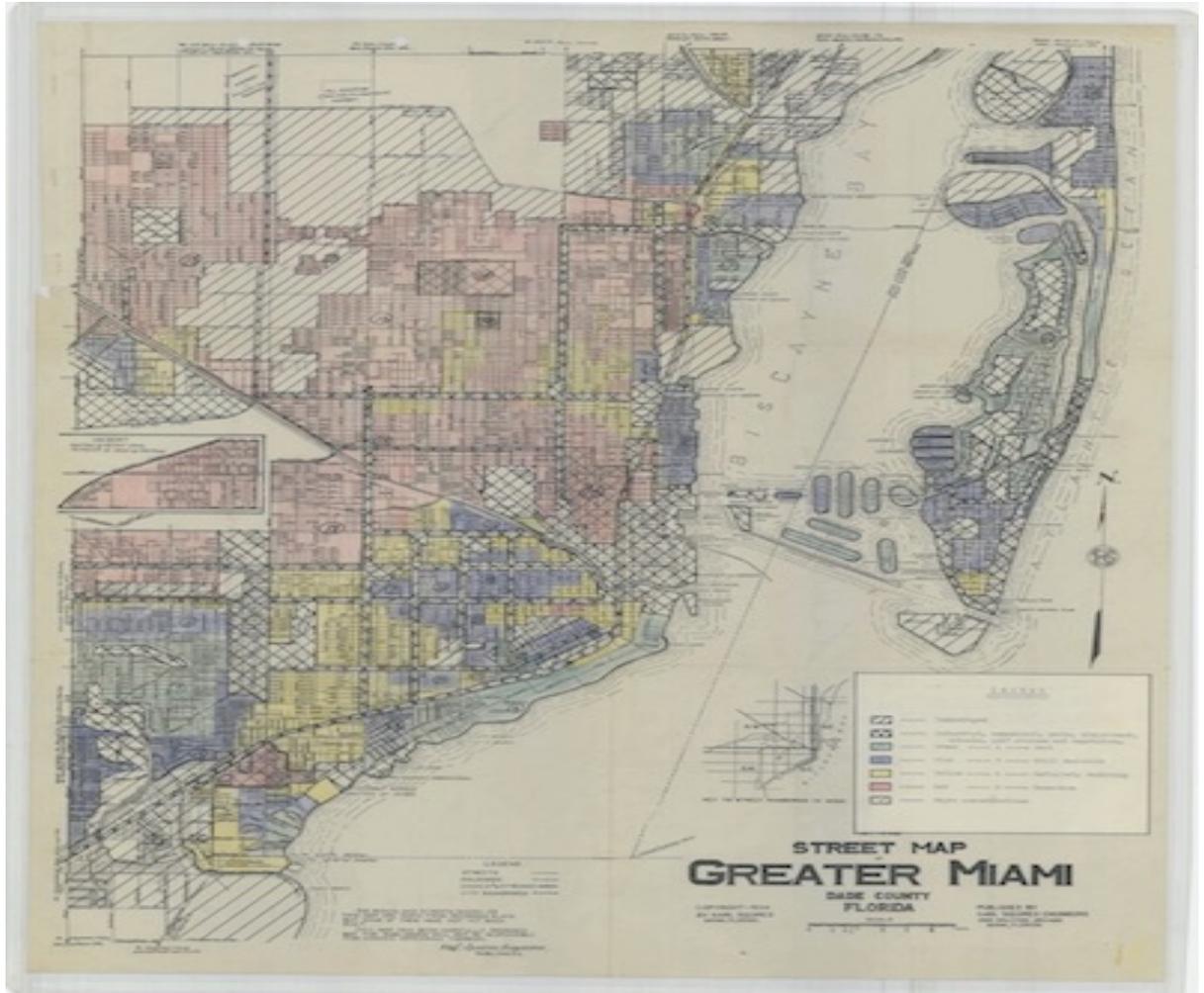
¹³⁷ Casey Pickett, "Elser Pier in Downtown Miami," May 6th, 2018 <http://miami-history.com/elser-pier-in-downtown-miami/>.

¹³⁸ Ibid.

before the onslaught of the state's rainy season. While white northern tourists enveloped themselves in sunshine, shaking off their winter blues and getting to "know Florida" (and, therein, themselves), L.W. Lighter worked the crowd in the Magic City tenor to make sure he was getting as much return on his or his client's investment in Black owned properties as possible, by flipping the lots over to white families. The flyer helps us understand the true literal and social distance between a beachfront, leisure attraction like Elser's Pier and the Black communities it disallowed entry to. The pier served as a platform for establishing even further distancing between the white shoreline and the Black inner-city neighborhood, reinforcing a planned environmental segregation.

The Black Caribbean and African American men who built the railways, hotels, and private mansions were not welcome on the premises alongside the sojourning white elites and middle-class once construction projects were completed—except in service positions, such as back-of-house cooking and janitorial staff. If Black men from South Florida who working on the Royal Palm Hotel returned to their homes and communities, they would in all likelihood be returning to the west side of Flagler's railroad, like Colortown in Miami—physically, only a few miles from the beach, but culturally and legally speaking a century out of reach.

Black Environments of the "Magic City": 1930-1950



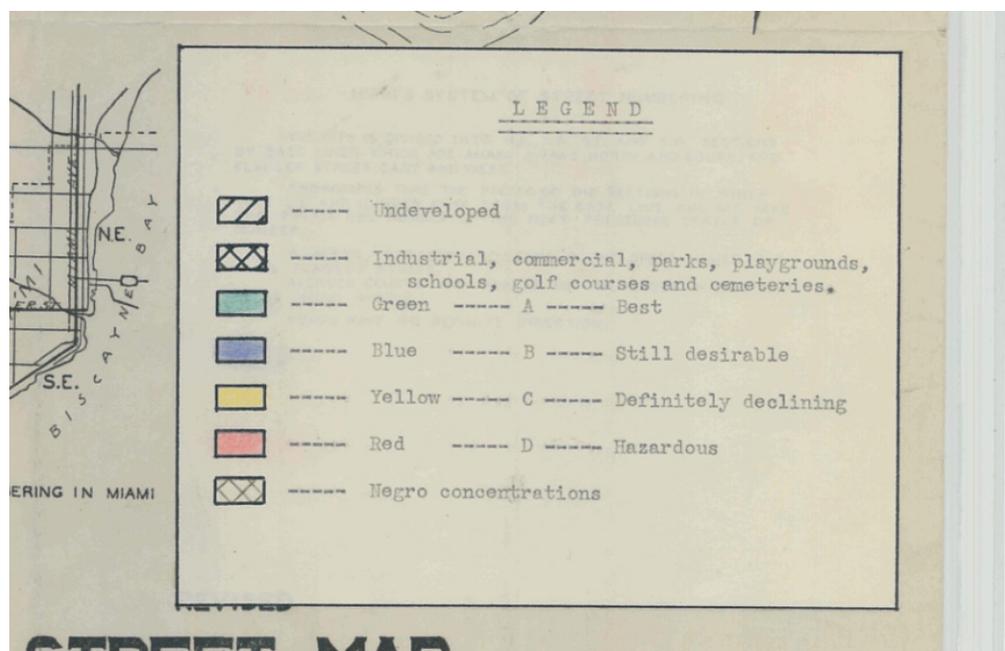


Figure 2.13. (top) A 1935 map used by bank loan officers and real estate agents to inscribe segregation into Dade County's urban landscape. Figure 2.14. (bottom) provides a close up of the map's legend.¹³⁹

Beginning in 1933, real estate agents and banks in major cities around the country began using color coded maps, like the one in Figure 2.13, to assign property values and allocate loans according to a neighborhood's racial make-up. In Dade County, banks acted as the everyday gatekeepers of private property, extending or withholding loans to prospective buyers according to their skin color. The 1930s thus ushered in a further entrenchment of the "Magic City's" racialized topography, or the dialectic of a whites-only envirotechnical beach resort landscape on the coast and a segregated blue collar and entrepreneurial class Black population a few miles inland on slightly raised geological plateaus. Redlining maps like the one above were created by

¹³⁹ "Redline Map for Miami, Florida," *Digital Public Library of America*, 1935, <http://dp.la/item/4573304fbab01ebd6f4b90de845c20ba>.

The Home Owners Loan Corporation, a federal agency created in 1933 to save the country from a mortgage crisis brought on by the Great Depression.¹⁴⁰

Each color of the map correlates to a “grade” (A-D) located in the map key (Figure 2.14). The green and blue colors filling in the island of Miami Beach and running down the water’s edge in Figure 2.13 were marked grade “A” and “B” neighborhoods respectively, or neighborhoods considered to be healthy investments for their white, middle- and upper-class residents. The yellow coloring on the map, however, indicated potential mixing of races and classes, demoting an area to a “C” grade, expressing caution with the qualifier “Definitely declining.” The red color filling in the area a couple of miles inland from the coast and stretching west towards the Everglades were marked as grade “D” neighborhoods, or neighborhoods mostly or entirely occupied by Black people, with light hatching inside these red zones used to explicitly indicate “Negro concentrations.” The Home Owners Loan Corporation map, then, became a technology in the mid-1930s for guaranteeing the reproduction of the entwined “Magic City” political-economic and environmental domination.

The private and public sector used this new tool to further simplify and order South Florida’s diverse population, so that Miami’s environment continued to accord with white power, its norms and expectations, and the needs of a white political economy. The redlining map essentially reified categories of Miamian. These identities—white, Black, “white Hispanic,” and mixed—were created at historically contingent axes of race and class that were informed by the “Magic City” political-economic structure, where white folks owned and luxuriated on the coast while Black and brown folks worked in service positions along Miami’s seaside and lived inland and, in large part, in disenfranchised segregated communities. City hall, big banks, and northern

¹⁴⁰ Rothstein, *The Color of Law*.

business offices continued to transform South Florida into a “human design scheme” during this period, similar to planned cities examined by James C. Scott.¹⁴¹ In fact, the county worked with another millionaire land developer, George E. Merrick, to design the upscale Coral Gables community in the 1920s, which became one of the country’s first purposefully planned neighborhoods of the twentieth century. In “Magic City” style, the community was built around Merrick’s behemoth, \$10 million Biltmore Hotel, which, when completed, surpassed the height of the county courthouse to stand as the tallest building around. Coral Gables was designed south of downtown and slightly inland, but is famous for its stunning, jungle-like planned environment, with banyan trees the size of shot-gun shacks lining its streets and tropical gardens blooming throughout the area.

It is important to note that elite whites were not the only ones profiting off of maintaining such inequality.¹⁴² N. B. D. Connolly has thoroughly demonstrated that Miami’s Black entrepreneurs and politicians at the time worked alongside white real estate moguls throughout Jim Crow, owning and operating segregated slums to make great financial strides off of the lack

¹⁴¹ Scott, *Seeing like a State*.

¹⁴² Scholars have approached the history of redlining in South Florida in a few ways: through analyzing private sector involvement, federal and state mandates, and a cross section of both of these frameworks. N. B. D. Connolly uses the optic of class analysis to detail the complex relations among white realtors and wealthier Black landowners during the early and mid-twentieth-century that constructed Miami as segregated and unequal. His account primarily analyzes the nuances of middle-class and rich Black folks’ participation in redlining and environmental segregation and the white supremacist oppression structuring that participation. Alternatively, Rothstein pins the federal government as a leading actor in the propagation of Jim Crow racialized geography. He argues Miami’s current racialized infrastructure was formed *de jure*, or by explicit governmental actions at the local and state level from the post-reconstruction era through to the 1970s. Further, he claims bigoted cultural norms and racist beliefs of private citizens did not supercede or even prompt state sanctioned segregation. Rather, governing institutions and law makers proactively instituted division and racial hierarchy so that they could reinforce white supremacy top-down, using housing and real estate as a technology to do so. Raymond A. Mohl’s analysis bridges both frameworks, claiming the private and public sectors worked in tandem across the colorline to successfully secure desired proximities between white and Black bodies, telling us, “by 1938, for all practical purposes, Dade County had been redlined along racial lines by the local real estate and banking community with the aid of the federal government’s appraisal system.”; Mohl, “Whitening Miami,” 326.

of housing rights and regulation for blue-collar Black Miamians.¹⁴³ Black entrepreneurs, like Dana Albert Dorsey for instance, hoped to build a “world more concrete” on top of the “shifting sands” of Jim Crow Black citizenship.¹⁴⁴ Dorsey, a self-fashioned millionaire that began as a construction worker for Flagler’s Royal Palm Hotel, in fact attempted to work along the axis of his rising class status to purchase an island in 1918 “in hopes of constructing seaside luxury estates and resorts exclusively for colored people.”¹⁴⁵ He was, however, muscled out of the property “possibly ...by white competitors” and had to sell it two years after its purchase to one of the richest white men in South Florida—Carl Fisher.¹⁴⁶

The following subsection attempts to answer what it was like to live so close and yet so far from the beach, and to have that socio-environmental distance inscribed into one’s Black identity. How else were the proximities to nature and white bodies maintained so that the “strategic authority” of the “Magic City’s” white political economy could thrive? And then, how was this distance, this environmental deprivation, resisted?¹⁴⁷

¹⁴³ “For Black people in the wider, postslavery Americas,” Connolly explains, “any hope of making citizenship more than a promise remained intimately bound to beliefs in and narratives about private property. This remained especially true under US law at the end of the nineteenth century, where Black peoples’ civil rights and voting rights stood on shifting sands.” See Connolly, *A World More Concrete*, 28.

¹⁴⁴ Connolly, *A World More Concrete*, 29.

¹⁴⁵ *Ibid.*, 27.

¹⁴⁶ *Ibid.*, 27.

¹⁴⁷ For the following sections I limited my research to Miami’s historically Black neighborhoods on high ground—Overtown, Liberty City, Lemon City and Little Haiti—currently experiencing an influx of real estate speculation, development, and/or gentrification. These neighborhoods’ official boundaries and racial compositions (predominantly Black) have stayed more or less the same throughout the twentieth and 21st centuries, with the exception of the blurred perimeters and cultural histories of Lemon City and Little Haiti. The Black Archives does not currently offer a collection speaking specifically to environmental histories. As such, the stories I’ve selected as supporting evidence for this chapter’s argument grow out of a cross-collection exploration significantly aided by the organization’s knowledgeable archivist. These examples, bounded by project scope and archival resources, build another opening into understanding why Black environmental histories and racialized topographies matter for factually informing and ethically knowing contemporary climate changing Miami.

The Liberty Square Projects: 1936

In the beginning, city planners and tenants alike called the segregated Liberty Square projects, constructed during the years between 1934 and 1937, a major success. The planned neighborhood's hurricane-proof concrete slab walls and sparse, yet manicured, landscaping was clean and new, which was a remarkable improvement from the seriously dilapidated downtown Black slums of Coloredtown. The Black families who were selected to move within Liberty Square's allotted boundaries cherished the fresh coat of paint on the walls, the crowns of young coconut palms, and the reasonable distance between themselves and their neighbors, having lived in blighted, overcrowded conditions.

A journalist named Thirlee Smith reflected on his time living in Liberty Square as a child in a 1963 *Miami Herald* article. He recounts a feeling of promise that the new projects inspired, explaining, "I remember 20 years ago [when the projects were built] it was a mark of success for many Negro families to move from the Central Negro District [also known as Coloredtown] because of crowded, pastel apartment slums into areas of Liberty City...My family was proud of its three-bedroom house of concrete block and what they thought was a sprawling lawn."¹⁴⁸

Liberty Square was a physical manifestation of Miami (at least partially) coming to grips with the shadow side of its "Magic City": the extreme poverty extant within its notoriously disenfranchised Black neighborhoods. The project provided its hand-selected residents a green, clean space to live, in a simulacrum of white lower-middle-class life and a gesture toward the law of "separate but equal." However, Liberty Square was in no way built to disrupt Miami's racialized political-economic order. Just the opposite, in fact. From its planning to its construction, the project's primary goal was to strengthen the divide between the "Magic City's"

¹⁴⁸ Thirlee Smith, "One Man's Journey Over the Wall," *The Miami Herald*, 1963.

modern recreational and business-friendly paradise and the working-class Black labor that kept it running.

Coloredtown, now known as Overtown, expanded in the 1890s in tandem with Miami's beach resort development. The neighborhood is marked in Figure 11's map with red coloring and light hatching, representing the area as a grade "D," toxic investment with a "Negro concentration." Over the course of its long history, famous Black artists, scholars, musicians, and sports stars would come to visit its clubs and stay in its modernized hotels along its "little Broadway." No matter how renowned, Black entertainers hired to perform on Miami Beach were not allowed to stay and luxuriate in the enchanting natural landscape alongside the white patrons coming to see their shows. Consider Louis Armstrong or Ella Fitzgerald. Even in the 1950s, when these high demand artists finished their sets, they would leave through the backdoor at Miami Beach's Fontainebleau resort built on that thin island marked with green and blue on that same Home Owners Loan Corporation map. They would then be driven back two miles west, over the long artificial bridge, toward higher ground, away from the beach, to their hotel rooms in Coloredtown.

Most middle-class and rich white folks only ever saw Coloredtown from their peripheral vision. It was the neighborhood where white families' domestic workers lived, where buses took maids and nannies when the day was done, until those women who scrubbed these white families' floors and cooked meals for their children reemerged at their doorstep the next day. For the owners, staff managers, and concierge orchestrating the "Magic City" beach resort experience, Coloredtown was where their busboys, janitorial staff, line cooks, and bellhops retired into modest living at night after laboring in the shadow of glittering modernity all day. On the other hand, for those keen to line their pockets with easy real estate fortunes, Coloredtown

was that redlined quadrant whose racial marginalization could be twisted and wrung out for great personal gains. White landlords, alongside several local Black elites, operated slums in Coloredtown openly and with no real pressure from outside the neighborhood's redlined boundaries to ameliorate the conditions of impoverishment. No running water, no clear regulations for waste disposal, no vermin prevention, no empowered tenants, all translated into no overhead costs for landlords. For the folks living there, the slums of Coloredtown meant a slow environmental violence endured across generations, a landscape of mud roads and rotting wooden walls of shotgun shacks inherited into the twentieth-century.¹⁴⁹ In the 1930s, however, the two primary white relations to Coloredtown—the employer and the slumlord—would come into conflict, and Liberty Square would be designed as a “resolution.”

More than anything, white folks living in blue areas closer to the coastline began fretting about the “cesspool” conditions of Coloredtown on the other side of the Flagler railroad tracks. As Paul S. George and Thomas K. Peterson's conclusions to their historical study of Liberty Square explain, “The principal concern, stated emphatically and repeatedly in correspondence from Miami to the Housing Section of the Public Works Administration (PWA) in Washington as well as in the press, was the threat of the transmission of disease by [Black] servants to the white homes in which they were employed.”¹⁵⁰ According to historian Carl A. Zimring, civility, moral character, and cleanliness became ever more entrenched as characteristics of whiteness during Progressive Era politics, when the science of sanitation began to dominate prescriptions for the environmental organization of both society and the individual home across the country. He reminds us that, though many white folks did not openly ascribe to the extremist ideology of, for

¹⁴⁹ Nixon, *Slow Violence and the Environmentalism of the Poor*.

¹⁵⁰ George and Peterson, “Liberty Square,” 54.

instance, the Klan, the epistemics and material practices of racial purity were already very much “in the mainstream of a newly toxic attitude about race in the United States,” one that “conflated sanitation with white identity” and “informed every sector of society.”¹⁵¹ Whites (and some Black elites) actively created the conditions for slum poverty in sectors of Coloredtown and then erased their hand in destructive profiteering by reifying hegemonic narratives of sanitation and diagnosing poor Black folks as inherently unwilling to be clean and civilized and, therein, prone to creating uncivilized, dirty environments. Slum living, disease, and backwardness then was also glommed onto Blackness itself during the Progressive Era, characterizing Black neighborhoods as filthy and dangerous on the whole, so that it was not necessary for a Black domestic servant to physically live within a slum for her body and personhood to be associated with the slum living of Coloredtown. middle-class and rich white employers of the “Magic City” feared that “the neglect of the homes and neighborhoods of Black women could spread epidemic disease even in the ostensibly pristine homes of white people...”¹⁵² They wanted new assurances that their houses would not be compromised by this embodied racial impurity.

The city of Miami began designing the Liberty Square projects in 1934 as a solution to this racialized, environmental imaginary of pestilence in Coloredtown. Improved living conditions for those suffering under slumlords was a happy secondary benefit. And still, one had to apply and qualify to gain entrance to Liberty Square. At the project’s design phase, employers asked for apartments to be reserved specifically for *their* maids and nannies, and that a low-fare bus route be organized to take workers across the redline and back each day. Even with a

¹⁵¹ Zimring, *Clean and White*, 78.

¹⁵² *Ibid.*, 103.

reference, a clean bill of health was required for candidacy, as “health certificates...would be required as part of the tenant application process.”¹⁵³

Liberty Square was built within its namesake, Liberty City, located inland on a slightly raised geological plateau, in 1936 during Miami’s larger “Negro Resettlement Plan” that would take place in various iterations between 1930 and 1960, and jumpstarted specifically by the New Deal.¹⁵⁴ Funding came directly from the New Deal’s PWA, and Miami’s Advisory Committee on Housing helped direct the efforts. A May 1937 *Architectural Forum* magazine spread feature the newly constructed, one million-dollar, low-rent project “built for Negro occupants who at present live in an extremely congested section near the center of the city”—here, referring to Coloredtown.¹⁵⁵ The article continues, “Liberty Square, recently opened PWA housing project, stands on the outskirts of the city of Miami. It’s 243 units are made up of one and two-story group houses containing from two to five rooms each. They will house only families who previously lived in substandard homes and whose income does not exceed five times the rent plus the cost of facilities.”¹⁵⁶

The architects’ blueprints demonstrate a modern plan for an ordered environment capable of preventing disease and inspiring good moral character. Each unit was even “equipped with sanitary equipment” so that occupants could keep things “clean and white.”¹⁵⁷ Additionally, when considering the grounds in the fold-out page photos in *Architectural Forum* it becomes clear that

¹⁵³ George and Peterson, “Liberty Square,” 61.

¹⁵⁴ “Race and Property,” *Miami Housing Solutions Lab*, <https://affordablehousing.miami.edu/housing-timeline/timeline/index.html>

¹⁵⁵ *Architectural Forum*, 1937. The Black Archives.

¹⁵⁶ Ibid.

¹⁵⁷ Zimring, *Clean and White*.

improved living conditions also meant making Liberty Square relatively green and open. Photos accompanying the article demonstrate how architects planned for lawns and green spaces to separate distinct units; whiteness and greenness emerging together here across the landscape within an environment built to embody and enact South Florida's racial norms. The pictures show freshly planted Squat Canary Island date palms dotting the landscape here and there, and skinny coconut trees erupting from the earth as tall as lamp posts to line the straight walkways emerging diagonally in the courtyard where the community center building sits. Contractors laid Augustine grass, and punctuated the turf with a children's playground and even a "garden area for adults" with "an open terrazzo...dance floor," was built "behind the community building."¹⁵⁸

While the clean and green Liberty Square projects eased the minds of white "Magic City" employers, it also allowed the city of Miami to relocate a growing Black population abutting its newly rebounding downtown area. At the time, a revamped white business district was emerging in response to the dual devastations of the Great Miami Hurricane of 1928 and the Great Depression. The "Magic City's" radius was therefore expanding into new territory, and the city wanted Black populations far enough away from its shoreline and downtown to keep it as free from the disease and social dis-ease of Black bodies as possible for residents and northern tourists.¹⁵⁹ However, they also needed Black employees close enough to be able to travel into work every day and labor in the "Magic City." The project's location—five miles north of downtown and two miles inland atop a geologic plateau, 15 feet above sea level, next to a white suburban development—was a calculated distance concretizing a new infrastructure for

¹⁵⁸ *Architectural Forum*, 1937.

¹⁵⁹ "Race and Property." Accessed August 29, 2020.
<http://cdn.miami.edu/wda/cce/Documents/Miami-Housing-Solutions-Lab/raceAndProperty.html>.

racialized proximities, and a renewed security for the future prosperity of South Florida's white environment.

What was it like living at these geological, geographical, and social distances within the boundaries of Liberty Square? Reporter Thirlee Smith solemnly recounts in his 1968 *Miami Herald* article held in the Black Archives, "One Man's Journey Over the Wall," how he grew up in Liberty City during the late 1940s. He focused his article on the Liberty City environment in particular. "I remember 20 years ago it was a mark of success for many Negro families to move from the Central Negro District [also known as Coloredtown] because of crowded, pastel apartment slums into areas of Liberty City...My family was proud of its three-bedroom house of concrete block and what they thought was a sprawling lawn." Moving from the crowded, tightly packed slums to a semblance of an open lawn, he explains, was linked explicitly with upward mobility within a context where green spaces were built and controlled by white people. He recounts the neighborhood's limited offerings for children looking to play, explaining, "When I was a child, the only park that existed for Black children was in the Liberty Square housing project. When swings and see-saws were broken, they were never fixed."

Smith then brings us to the focus of his article: a concrete wall that was built to physically segregate the Black community from its suburban white neighbors. The wall lining the Liberty Square projects was one blunt technology built into the landscape to maintain racial proximities. It was an essential feature of the urban environment, and Black people lived their lives in relation to its boundary. A sliver of its original form remains above ground today along Northwest 12th Avenue in Liberty City. Today, it's easy to mistake it for a three-foot-tall brick guard rail blocking the sidewalk from the endless flow of cars. But, between 1935 and (we can reasonably estimate from archival material) 1959, this wall stood around eight feet tall.

According to Smith, the wall was “built with city funds to separate the Negro project area from the white community just east of it.”¹⁶⁰ However, the current Executive Director of the Black Archives Timothy Barber claims that, if the city did fund and build the wall themselves, no archival trace of the project remains. “When you pull the federal architectural plans for Liberty City,” he recently told a local news reporter, “the wall doesn’t exist. You go to the city to try to get plans for the wall—it doesn’t exist.”¹⁶¹ Perhaps it was constructed by some of the local white property owners at the time, 2,600 of whom signed a petition in 1933 against Liberty Square’s construction on account that it would cause them “infinite strife and bloodshed,” a claim which successfully delayed project approval for a year and then interrupted its development mid-construction in 1935.¹⁶² Smith’s was the only reference to the city’s involvement I found during my own research, and attributing responsibility to the Nor’ League, a group of white property owners in Liberty City, is speculation at this point. Nonetheless, whomever—the federal government, the city, the local white neighborhood association, etc.—was responsible, their intention was clearly to install distance and organize their neighborhood environments according to the norms and expectations of Jim Crow. Distance had to be maintained for the sake of preserving real estate values, tourism, and the physical health of “Magic City” residents. If a Black community was to be thrust onto this new inland landscape, new boundaries had to be set, literally, in stone.

Thirlee Smith speaks of the Wall as a feature of the environment, one that fundamentally sculpted his boyhood experience:

¹⁶⁰ Thirlee Smith, “One Man’s Journey Over the Wall.” *The Miami Herald*, 1963.

¹⁶¹ Teresa Joseph, “The Untold History of Liberty City’s Segregation Walls,” NBC 6, May 4th, 2018, <https://www.nbcmiami.com/news/local/the-untold-history-of-liberty-citys-segregation-walls/2001133/>.

¹⁶² George and Peterson, “Liberty Square,” 57.

“The city beyond the wall remained a mystery to me until my teenage years. I heard all kinds of wild stories from kids who had a [sic] one time or the other claimed that they went over. The most common was that of a ‘white bearded hermit that cooked Black boys in a large red oven.’ There were larger boys in the Black community who told of adventures with quicksand and fights with white boys who lived across the wall. I really didn’t believe these stories, but they added to the mystery and fear of venturing over the wall.”

While the stories of a white bearded hermit and quicksand Smith heard as a child may have been tall tales, a Liberty City resident named Carolyn Jones confirms in a 2006 letter to the editor of *The Miami Times* held in the Black Archives that courageous young Black men often resisted the concrete infrastructures built to keep them within certain environmental limits. In her letter she describes how “The Wall produced an arm of strength for many young Black boys,” a test of grit, for better or worse.

“How, I can remember my brother along with others coming home drenched with sweat—out running the sound of guns, the footsteps of whites who ran in pursuit of them. Though the act may have sounded drastic, it brought about laughter from the young boys who decided they were not going to take that long walk around the Wall on the way home from a football game.”¹⁶³

¹⁶³ “Across that wall a thick grove of pine trees grew. Every Christmas season, Black men, some with their sons went around that Wall, chopped down what they could not afford to buy and how about Christmas was Christmas every year. Standing tall decorated to the max, shame coupled with determination to stand tall as Black men grew out of the exist [sic] of that wall.”

Jones describes Liberty Square between 1940 and the 1960s as a limited and violent environment. While local media construes Liberty City's contemporary "black on black" bloodshed as the product of an unfortunate concentration of inherent criminality, Jones' archived account instead brings into sharp focus the fact that violence began at the hands of white middle-class suburbanites at the project's origins. Jones describes how local Black men conscripted to fight in World War II were also forced into wars with their white neighbors on the home front who promised "infinite strife and bloodshed" at the outset of Liberty Square's construction. Jones explains,

"Though Black men found themselves drafted to fight a war overseas. Shedding blood losing lives for a cause that was certainly not one of their own. At home presented its own war for their kind. Freedom was anything but free. The memory of the Wall houses the sound of gunfire - bombs bursting the nights silence. As whites demonstrated their hate and determination for Blacks to be held oppressed on the other side of that Wall."

Her account here brings to life the purpose of redlining's infrastructure, which was to create social and material impressions into landscapes and onto bodies so that they would last. We see this when she writes "When one speaks of the Wall it is like a permanent fixture engraved in the minds of those who lived through its exist [*sic*]. To speak of it and acknowledge its impact means that you were a part of an [*sic*] historical energy of the Black community's plight."

Though originally lauded as a major accomplishment of "civilizing" and assimilating a small neighborhood of Black laborers, Liberty Square is narrated now as a failed project. The story goes that when the Negro Center, formally known as Colortown, was violently split down the middle by the construction of I-95 in the late 1950s, Black slum tenants were cleared out and

moved into the northwest quadrant of Dade County, in and around Liberty City and Brownsville. “Black violence,” drug use, and other ills of poverty then inevitably spread, creating the brutal landscape for which Liberty City is now notorious. In the Square itself, temporary welfare housing for young Black laborers with ties to the white “Magic City” turned into permanent homes for Black families who could not compete on the job market with a sudden mid-twentieth-century influx of cheap Latinx labor and, therefore, limited economic and social mobility.¹⁶⁴

In analyzing Liberty Square’s original architectural features and the amenities provided—the pre-installed sanitation equipment, segregating eight-foot wall, buses to and from coastal employment—we can see how the project was built as a racialized environment developed in direct relation to its inverse, the “Magic City.” Yet, the “Magic City’s” racialization is equally pronounced in what is absent from the landscape, or the manifest forms of environmental deprivation engineered by white supremacy.

For instance, the *Architectural Forum* document claims that “swimming and wading pools” were built for Liberty Square residents, “flank[ing]...either side of large grass plots” around the central community building. In Florida’s year-round heat, one might argue that access to recreational swimming was (and will increasingly become) a public health issue. But these recreational facilities were never built. While a community pool was originally drawn into the project’s blueprints by its architects, another public health issue won out against its construction,

¹⁶⁴ This is a key insight offered by Paul S. George and Thomas K. Petersen; See also Eric G. Tscheschlok, “By 1965, Liberty City had become the nucleus of a 15-square-mile Black corridor stretching from Brownsville to Opa-locka on the distant northwest fringes of the metropolitan area. And, as late as 1968, this sector continued to spread at the rate of a block and a half per week.” See Eric Tscheschlok, “Long Time Coming: Miami’s Liberty City Riot of 1968,” *The Florida Historical Quarterly*, 1996, 440–60.

that of concerns of recreating “cesspool” conditions among Liberty Square’s Black population.¹⁶⁵

As Paul S. George and Thomas K. Peterson put it:

“Dr. Marvin Smith, a physician serving on the all-white Advisory Committee, suggested in early 1936 that a swimming pool represented a risk of transmission of syphilis and thus should not be included in the project Liberty Square article. Although the PWA Housing Director disputed Dr. Smith's assertion and countered with the opinion of his own expert (‘Dr. Von Derlehr was very much surprised at Dr. Smith's statement... He further said that he had never heard of syphilitic infection from a swimming pool.’), the local view prevailed and Liberty Square, the public housing project, opened without a swimming pool.”¹⁶⁶

White supremacy not only policed the proximities and relations between Black bodies and white bodies, reproducing Black bodies as laboring bodies in the process, but also regulated proximities within Black populations and controlled their ability to seek out recreation as well. So much so, that the right to recreation—and specifically, the right to swim and play at the beach—became a major demand among NAACP civil rights protestors in South Florida and around the country in coming years.

“Wade-In” Protests and Swimming While Black: Resistance in 1940-1970s

When Black laborers ended up seeking out leisure and fun, stories of debauchery and laziness spread. Whites and middle-class Black folks decried the insidiousness of illegal gambling (as opposed to the other kind of gambling white folks did) and the violence of “gangs”

¹⁶⁵ Wiltse, *Contested Waters*.

¹⁶⁶ George and Peterson, “Liberty Square,” 56.

and roaming idlers. Prominent Black community members also warned that behaving in any unrestrained or unproductive manner could reflect poorly on the Black race as a whole and perhaps be detrimental to the long civil rights struggle. Free play was designated as the exclusive right of the white middle-class and wealthy in the Magic City.

Black movement had to be circumscribed and regulated through environmental, geographical, and geological ordering so that whites could express this entitlement to urban space and natural landscapes. Movement itself became racialized in this dialectic of circumscription and affordance. How one moved through South Florida—with ease, a sense for recreation, and comfort—made a person as white as much as the color of their skin. Enacting white Miamianness in particular meant building relationality to the banyan trees, the jungle gardens, the beach, the fish, the sand, and the sun of the sunshine state. Contrast this with the distress and haunting uncertainty of moving through these landscapes expressed in Thirlee Smith's and Carolyn Jones' accounts.

Yet, as both accounts also articulate, Black people refused total acquiescence through both quiet and loud subversions. Black teenagers found off-the-grid swimming holes that carried their own physical risks while families took trolling boats out to unclaimed keys in the bay to celebrate birthdays and holidays. South Florida's entwined infrastructure of political-economic and environmental white supremacy could not eliminate the desire to commune with the peninsula's unique ecological and geological features. But if taking shortcuts through white neighborhoods meant "enter at your own risk," staking out a hidden spot under palm trees in the sand at night meant "swim at your own risk."

White city planners denied Liberty Square a swimming pool for fear of the racialized "cesspool" conditions—of the perverse spread of syphilis in particular—it might create, with

water imagined as a special conduit for, perhaps risky, bodily intimacies. Geologically ancient fluvial bodies became dangerous mediums for racial mixing in the minds of white Floridians and white domestic tourists. Like the material and symbolic fluidity of miscegenation, or the criminalization of racial “interbreeding,” and the “one-drop” purity rule, or the scientific and colloquial truism that a single drop of non-Caucasian blood in an otherwise white body could make a person Black, oceans, lakes, rivers, and pools could pollute white immaculacy and endanger the individual body and the social body at once.¹⁶⁷

There was (and still is) something about water itself that conveyed bodily mixing through indirect contact. Imagine entering a body of water. When you step into an ocean or a pool, the water consumes your person and it disperses properties, such as oils and fluids, throughout that aquatic environment. Frequently, folks casually spit and urinate into such bodies of water. Swimming together, then, creates a fluvial environment of new bodily connections, mixing across different forms and through bodies.¹⁶⁸

To the average white tourist, developer, and Miami resident, swimming with a Black person in the first half of the twentieth century most explicitly, meant undesirable body-to-body proximity at best and the potentiality for supremacist “corruption” at worst.¹⁶⁹ Andrew W. Kahrl describes the brutal consequences of wading past locally instituted racial color lines in the north, reminding us that “the infamous 1919 Chicago race riot, which lasted seven days and claimed 38

¹⁶⁷ As Jeff Wiltse examines, the development of the community pools in northern cities as a specifically racially segregated, white space of leisure did not begin until the 1920s, in part as a reaction to the Great Migration of Black folks from the South; See Jeff Wiltse, *Contested Waters*.

¹⁶⁸ Langston, *Toxic Bodies*; Mitman, *Breathing Space*.

¹⁶⁹ This aquatic, anti-black white supremacy continues well into the twenty-first century in Florida. I have, in fact, witnessed it first hand. Though swimming with our Black childhood friends in our mid-sized in-ground pool was totally normalized in my nuclear household, my extended (first-generation Sicilian, immigrant) family feared such “mixing.” Notably, my uncle once drained and scrubbed his own pool after he found out a Black child had swam in it with his youngest daughter.

lives, began on the shores of Lake Michigan, when white youth gang members stoned to death a Black teenager named Eugene Williams after he had accidentally drifted across the color line in the water.”¹⁷⁰ In Roanoke, Virginia, during the spring of 1926, a dammed off body of water was transformed into a beach area for Black folks.¹⁷¹ However, the dam water also fed the source of a white resort’s swimming pool. Before the Black beach could officially open, the Ku Klux Klan bombed that dam.

Black folks avoided those pleasant and safer areas to swim designated for whites. Such avoidance, Kahrl continues to explain, eventually had its own deadly consequences as, “throughout the Jim Crow era, shockingly high numbers of Black youth drowned each summer while playing in dangerous, and unsupervised, bodies of water.”¹⁷² As Kahrl states,

“While we tend to think of segregated beaches and public parks as among the most irrational excesses of the Jim Crow era (how absurd, after all, is the notion that one can demarcate a color line across a body of water), racialized leisure space served an important function in the maintenance of white supremacy. In Jim Crow America, working- and middle-class whites came to see public beaches and parks as their own private domain—a publicly funded ‘country club for the common (white) folk—and [in later decades] understood desegregation as the theft of ‘their’ beaches and parks at the hands of privileged white public officials.”¹⁷³

¹⁷⁰ Andrew W. Kahrl, “America’s Segregated Shores: Beaches’ long history as a racial battleground,” *The Guardian*, June 12th, 2018, www.theguardian.com/world/2018/jun/12/americas-segregated-shores-beaches-long-history-as-a-racial-battleground.

¹⁷¹ Kahrl, *The Land Was Ours*, 47.

¹⁷² *Ibid.*, 47.

¹⁷³ Kahrl, “Warning: Black People at Leisure.”



Figure 2.13. Cartoon by John T. McCutcheon, *Chicago Tribune*, July 28, 1919.

Water recreation in Miami was life giving, physically as well as spiritually.¹⁷⁴ It relieved bodies of the full burden of living along the Tropic of Cancer while connecting folks to the power of the Atlantic Ocean. South Florida has always been an essentially hot, swampland. The 100 percent humidity in August shortens your breath and swallows you whole. The heat (rising now with global warming) kills vulnerable people, and air conditioning has been legally required in commercial and rental properties for decades. Miami was and remains a beachy, sandy, watery, swampy, and salty tip of a peninsula. It was as humiliating as it was impossible to demand a group of people not access the water surrounding them. The absolute importance of leisure in a more comfortable environment as a staple of life was such that Black folks began risking serious injury, imprisonment, and even death to create knowledge about and identity with the environment themselves, and to simply swim at the beach.

Gregory Bush describes one of the boldest pre-Civil Rights era protests undertaken. Presaging the “If It Takes All Summer” civil rights campaign led by Martin Luther King Jr. by

¹⁷⁴ Kahrl, *The Land Was Ours*, 54.

twenty years, a group of Black protestors went down to the county's "whites only" Haulover Beach in 1945 and waded into the water.¹⁷⁵ Lawson Thomas, a prominent Black lawyer, led the way. The action made serious waves, catching the attention of chairman of the county commission, Charles Crandon. As a result of this initial major wade-in protest, which was inspired by the "sit-in" protests of the civil rights movement, Baker's Haulover Beach became the segregated all Black Virginia Key beach in 1945. It became a place of dancing, family celebrations, and, importantly, swimming for Miami's Black community despite the fact that the island was only accessible by ferry at the time.

Crandon was a popular white chairman, known for his tolerance of civil rights issues and his fiscal responsibility. His obituary in *The Miami News* January 2, 1980 also recalls all his beneficial work for Dade county's environment, telling the readers, "He advocated natural preservation, parks and outdoor recreation for an area that, as early as the mid-1920s, was in danger of being exploited to death."¹⁷⁶ He was so beloved for his environmental caring, a (whites only) public swim park was named after him, called Crandon Park on the island of Key Biscayne. As Bush describes, Crandon, the county attorney, and county manager did not only create Virginia Key beach as a means of "accommodating" Black folk's demands for recreational space during legal segregation. He tells us, "in the 1930s, white leaders conceptualized a 'colored beach' on the [Virginia Key] island as an adjunct to the removal of Blacks from downtown Miami. Their aim, in part, was to separate Black people from white tourists and move them out of the way of land developers responding to growing Black demands for access to the bay."¹⁷⁷ He cites Crandon selling the public on his plans to create Virginia Key beach, and, as if

¹⁷⁵ Bush, *White Sand Black Beach*, 1-17.

¹⁷⁶ "Charles Crandon Obituary," 1980, *The Miami News*.

¹⁷⁷ Bush, *White Sand Black Beach*, 6-7.

to “underscore the distance between Virginia Key Beach for Blacks and the newly projected Crandon Park for whites,” Crandon tells the media, ““Virginia Beach is separated from Crandon Park by an expanse of water known as Bear’s Cut which is approximately [one] half-mile wide.””¹⁷⁸

However, this half mile wide distance would soon be closed by two NAACP members in 1959 working to open up all beaches to all folks of color. Garth Reeves, the legendary civil rights activist in Miami with whom I began this chapter, was one of these two members. Reeves and his constituency fought against anti-black environmental deprivation during the civil rights period and beyond can be considered predecessors of the climate justice movement in South Florida today. The intergenerational movement for environmental justice asks us to think of our natural landscapes as spaces rife with ethical and political tensions, then and now.

When I interviewed Reeves in his family home on the bay in spring 2018, he began his story from the very beginning. Reeves’ family moved to Florida from the Bahamas when he was four months old and established themselves in Miami’s thriving Overtown community. His father wrote for and printed *The Miami New Times*, a Black newspaper. “Black newspapers were doing what they can,” he said plainly, “but the main thing we were doing was ...trying to keep a count of how many Black people were lynched in that year, during that month! I’m talking, 20-30 people hung by the neck until they’re dead, you know that was kinda hard to swallow.” Reeves’ family newspaper helped expose the white supremacist terror campaigns built into the social and political structure of the South at the time.

Reeves attended the only junior high and high schools available for Black students during Jim Crow, Paul Laurence Dunbar and Booker T. Washington High, which are still standing

¹⁷⁸ Ibid., 40.

today.¹⁷⁹ Reeves experienced the naturalization of his segregated environment on a daily basis. Still, upon graduation, Reeves protested educational apartheid by applying to the University of Florida, a whites-only college, in pursuit of a degree in journalism to follow in his father's line of work. "I wrote to the University of Florida," he tells me "and I didn't even get a return [to sender]. Because you sent a picture with your application, so that killed me right then, [I knew that would kill my application]. But I sent the picture." He ended up graduating from Florida Agricultural and Mechanical University (FAMU), Florida's first historically Black college, by pulling together a different curriculum so that he could still study writing, history, and literature. "You didn't get a journalism background," he explains, "you got whatever you could salvage."

Despite the oppression he experienced as a Black soldier in a segregated army drafted into World War II, Reeves told me he returned to his hometown, Miami, encouraged and inspired. If the U.S. had become so insistent on fighting racist fascism abroad, he thought, white Americans might be at a point in history where they could confront their own hypocrisies. Unfortunately, justice would not come so easy. He became an active member of Miami's NAACP chapter, sitting in at segregated lunch counters, enduring harassment and embarrassment, and battling for the equal, desegregated schools promised by the Supreme Court's 1953 *Brown v. Board* decision but denied at the state and local levels. However, his first fight for leisure, the one that connected him to the efforts to desegregate Miami's beaches, involved confronting a public golf clubhouse illegally denying Black membership. The NAACP sued the Miami Springs golf course clubhouse and won at the level of the Florida Supreme Court. The case was then used as precedent across the South. Of course, such rulings must be

¹⁷⁹ Reverend Theodore Gibson, a childhood friend of Reeves and later the NAACP chapter president while Reeves was an active member, recounts how racial oppression was built into presence and absence of certain facilities at Booker T. Washington High School, noting, "...there was no water in the science laboratory, but it had been promised...there was still none in 1945. We were promised a gym in 1934, and there was none in 1948." See Chanelle N. Rose. *The Struggle for Freedom in Miami*.

enforced. When Reeves and another NAACP member attempted to enter the golf clubhouse after the decision was brought to bear, they were denied entry. “They didn’t want to accept it when we won the suit against the golf course out here. And they said, ‘No we haven’t had any word yet from the Governor.’ And we said, ‘Well you better read the papers a little more!’ And we told them what page [the final ruling] was on. And they knew it was there [but they ignored the ruling].”

Reverend Theodore Gibson served as president of the NAACP Miami chapter during the late 1950s when Reeves was an active member, and his desegregation campaign efforts emphasized breaking down the white supremacist stranglehold on recreational spaces and leisure activities in South Florida. In a 1959 *Miami Herald* article titled “NAACP Sues City In Three-pronged Integration Move,” staff writer John Morton reports:

“The Reverend Theodore Gibson, president of the Miami NAACP chapter, said he will ask County Manager O.W. Campbell for an appointment next week to request integration of all Dade play areas. The largest are at Haulover Beach, Crandon Park, Matheson Hammock and Homestead Bayfront Park. Attorney G. E. Graves, an NAACP member and leader of its program here, filed a suit in Federal Court seeking integration of the Manor Park Swimming Pool in Miami. The suit charged Miami set up a ‘deprivation of rights’ in barring Negroes from the tax-supported pool on Oct. 16. It asked for a ‘declaratory judgement’ in favor of integrating Manor Pool. Graves said the suit was aimed at only one of Miami’s all-white pools because ‘that’s where they went and that’s where they were refused.’ It was drawn in the name of two of the women who tried to enter the pool but were turned back by pool superintendent Jerry Meslen.”¹⁸⁰

¹⁸⁰ John Morton, “NAACP Sues City In Three-pronged Integration Move,” *The Miami Herald*.

The NAACP's three-pronged campaign for 1959 put recreation, and specifically swimming, front and center on the agenda for Miami's civil rights battle. "Haulover Beach, Crandon Park, Matheson Hammock and Homestead Bayfront Park"—these were all white beaches. White folks' easy movement through Miami's environment and their economic exploitation of the shoreline, their very identities so fortified by measured proximities away from people of color on land and water—distances physically built into the geography and topography of the city and violently regulated by police and mob alike—became deeply threatened. People of color, it was preached, must be kept away from beaches, resorts, pools, and clubhouses in order to preserve the entwined ethos of racial purity and economic security, the latter specifically because white northerners did not want to vacation alongside local Black families. "Unless we get definite word now that tax-supported county facilities will be integrated," a news source from the time reads, "the Negroes will avail themselves of our beaches—we can't hold them back much longer."¹⁸¹

As Reeves recalls, the first attempt to close the racial water gap between Crandon Beach and Virginia Key occurred between 1957 and 1959, when the NAACP chapter decided to construct a "confrontation."¹⁸² Such confrontations cracked local official's ethos of stalling,

¹⁸¹ The biographer unfortunately left no citation for the remark.

¹⁸² The newspapers either didn't catch wind of the planned confrontation or they didn't care much, so the exact date is difficult to pin down without reaching out for further oral histories. There is also either an additional or counter narrative presented by an amateur historian named Carita Swanson Vonk who published Reverend Gibson's biography in 1997. Her account of the Crandon Park wade-in reads as follows: "Gibson led seven other Negroes to swim at Crandon Park...The Negroes, including two women, bathed and swam for half an hour without incident, as thirty-two whites watched curiously. Metro Police lined around the group. Garth Reeves produced all his father's tax bills from 1919 to show that his family had paid 9% of their taxes for county beaches." She does not provide citations. When I asked Reeves about the details of this event (the date, his producing his tax bills, who was in attendance, etc.) it's clear the narrative he provides is very different from Vonk's account. Looking over the archival material, I believe Vonk's narrative could be the product of an amalgamation of different newspaper clippings and perhaps the mislabeling of one wade-in protest for another. Her account may be a portrait of a wade-in at Manor Park swimming pool, rather than Crandon park beach. Evidence suggests this, foremost because in 1959 the Miami Herald reports Gibson claiming the NAACP chapter was suing Manor Park specifically because two Black women were denied access to the pool, saying "that's where they went and that's

neglect, willful ignorance, and denial of illegal and immoral racial oppression wide open, creating an event which hailed authority and forced them to respond. “[When] you go down to the commission meeting, they say, ‘Jeez, we sorry. You guys know we’re trying.’ We say, ‘You tried long enough, and today we’re gonna...see how hard you try.’”

Planning the confrontation began with calling a special group meeting. “We had a special group...” Reeves explains to me, “people who were not afraid of getting beaten up or thrown in jail. And we had a meeting over at Gibson’s house at 7 o’clock [in the morning]. And we all had breakfast ...and we made our plan and we promised to meet ... 2 o’clock [in the afternoon] was our meeting time.” Twelve men of the NAACP’s special group were to meet at Crandon Park beach at two that afternoon. “I remember walking down, I think one of the white ...newsmen tipped me off,” Reeves explains, “He said ‘Watch out. They're gonna try to get you down in that bathhouse [, the bathhouse used as a changing facility on Crandon Beach,] and once they get you in there they're going to have some hooligans in there beat you up and leave you there.’ He said, ‘They got it well planned.’ I said, ‘Yeah’...I didn’t say anything to the other guys cause that would have scared them away anyhow.” Despite his discretion, only two of the twelve members—Reeves and Oscar Range—showed at the meeting point at the appointed time.

Given the white newsman’s warning, Reeves and Range made like they were heading for the bathhouse, but then changed course, heading directly for the water, “straight down to the beach.” They dressed so they wouldn’t have to change into swimsuits. They peeled off their shirts, shook off their sandals, waded into the big blue Atlantic and played in its crisp water. He recalls, “[Oscar] and I went into the water...We were wading around and we saw white people over there looking all...thinking ‘these guys must have been crazy’ or something like that...We

where they were refused.” It is also not outside the realm of possibility that Vonk had access to other materials, privately owned archives or oral histories with folks now passed, but because there are no citations, I cannot be certain.

knew we were being watched so we just made sure they saw us, haha... We just wet our head swimming around and around and we did that for twenty or thirty minutes. And nothing happened, nobody came out to the [beach to stop us]." It turns out that county commissioners and police officers were waiting for Reeves and Range in a conference room located in the recreation area. Though the officials confronted the protesters, claiming their actions were "illegal," neither was arrested or harassed.

Conclusion

While the previous chapter demonstrated how Florida's geological history, current political economy, and future sea-level rise enmesh in local climate predictions, this chapter opens the door to a Black environmental history of South Florida that, I contend, is equally crucial for understanding current politics of climate change and the local meaning and form of scientific forecasts. In this way, Chapters 2 and 3 work together to show how the historic racialization of South Florida's political economy, or its "Magic City" structure, echoes into the present, and threatens to resound into the climate changed future at the expense of Miami's poor Black and brown communities. When we forefront the dialectical development of the "Magic City" on the coast and Black neighborhoods inland and on higher ground, a critical ethical-political opening emerges in relation to climate change predictions. It becomes a hindcast for the future, showing how these neighborhoods will shortly be made vulnerable to natural disasters and racialized capital in ways that echo the history of the "Magic City." In the next chapter, I show that climate justice activists contribute a critical facet of local climate knowledge by referencing the history of Miami's environmental racialization. Building from the cultural legacy of "wade-in" protests, organizers advocate for responsible climate adaptation that rectifies

the history of white environmental domination, rather than a form of “resilience” that reproduces it.¹⁸³

CHAPTER 3

What the Future Looks like From Here: The New Magic City, Climate Gentrification, and Legitimacy’s Ignorance

Maybe where I grew up at, it was never magic for us.

— Valencia Gunder¹⁸⁴

When sea-level rise predictions began circulating among anti-racist activists working in historically Black and brown South Floridian neighborhoods in 2015, organizers began to forge a connection between their segregated areas on higher ground and new ways that rising tides will increase their vulnerability to racialized capital. They began using the phrase “climate gentrification” to explain this connection. According to these organizers, the rich coastal area bolstered by beach-going tourists and mega-entertainment complexes—the “Magic City,” built by white developers throughout the twentieth-century along the beaches (Chapter 2), and kept today by the world’s tenth highest concentration of billionaires—will move inland onto higher-ground in response to sea-level rise predictions, pushing out long established working class and poor residents of color. They use this powerful epistemic addition to local climate knowledge to challenge resilience governance—the new powerful bureaucracy established to address climate impacts in South Florida. Activists demand Resilience Officers include climate

¹⁸³ Haraway, *When Species Meet*.

¹⁸⁴ I pulled this quote from an interview given in Jessica Moulite, “Color of Climate: Meet a Power Player in Miami’s Fight Against Climate Gentrification,” *The Root*, August 11th, 2017, <https://www.theroot.com/color-of-climate-meet-a-power-player-in-miami-s-fight-1797702979>.

gentrification as a variable in their plans to adapt the region to future sea-level rise—a tall order for a city which consistently prioritizes development above social welfare.¹⁸⁵

Climate change predictions fracture our understanding of linear progress and humans' place in history like nothing else, calling coastal cities like Miami to address an imminent future more intently every day, to adapt or else. Yet, as climate gentrification demonstrates, the numbers and graphs portending sea-level rise never speak for themselves and can't articulate a good vision for society on their own.¹⁸⁶ People do that. And the ways in which we can imagine what's to come depends on how we narrativize the past and present—different narratives allowing and precluding how we can think the future, and what values and priorities we build into our plans. What futures, then, become possible for this extremely climate vulnerable region when its long history of racialized socioeconomic inequality is forefronted instead of a tunnel vision set on a horizon of perpetual economic growth? We can ask questions like these when we begin thinking of climate change predictions as ethico-political objects, rather than omnipotent facts with technical solutions only awaiting the deft hands of a good engineer.¹⁸⁷

In this chapter, I advance three related arguments about climate gentrification in Miami. First, when we keep South Florida's racialized topography, or its "Magic City" history, in view as climate justice activists suggest, we see how typical climate resilience narratives take for granted that those populations most vulnerable to sea-level rise will be those closest to the sea. Studies consistently rate Miami as one of the most unequal cities in the U.S. Its disenfranchised,

¹⁸⁵ Aja et al, "The Color of Wealth In Miami Report"; Ponczek and Lu, "The 10 Most Unequal Cities in America."

¹⁸⁶ Callison, *How Climate Change Comes to Matter*; Puig de la Bellacasa, *Matters of Care*; Hughes, McDermott, *Energy without Conscience*; Koslov, "Avoiding Climate Change."

¹⁸⁷ Günel, *Spaceship in the Desert*.

majority Black neighborhoods are inland and on higher ground—precisely where developers will be flooding in from the coast.¹⁸⁸ Second, I reframe climate gentrification as an epistemic object developed at the grassroots with the power to subtend climate science and become a critical addition to South Florida’s growing body of local climate knowledge. As an epistemic object, climate gentrification assembles Black environmental histories and present socio-economic realities together in a forecast, predicting unabated inequality exacerbated by sea-level rise. It activates, in María Puig de la Belecasa’s phrasing, an ethico-political dialogue about Miami’s racialized topography and redefines “resilience” as the constant, exhausting task racialized capitalism puts onto marginalized communities so that certain parts of South Florida may thrive.¹⁸⁹ Third, although expert research into climate gentrification is a powerful and necessary tool, it tends to inadvertently drive public discourse into a ditch by simultaneously taking control and foreclosing conversation with the question, “Is climate gentrification *really* happening or not?” This question distracts from the movement’s central point and conceptual artifact. In this way, legitimated research on the topic creates ignorance as it produces knowledge.¹⁹⁰

What follows pointedly captures the relationship between knowing and responding ethically to climate knowledge at the local level. This chapter continues to localize climate predictions in South Florida and build deep environmental and political context. Through this context, we can begin to recognize and analyze the social, political, and epistemic forms emerging from a general belief in human induced climate change and growing public trust in scientists’ predictions.

¹⁸⁸ Florida and Pedigo. “Toward a More Inclusive Region,” 3.

¹⁸⁹ Bellacasa, *Matters of Care*.

¹⁹⁰ Mills, “White Ignorance.”

A Tale of Two “Magic” Cities

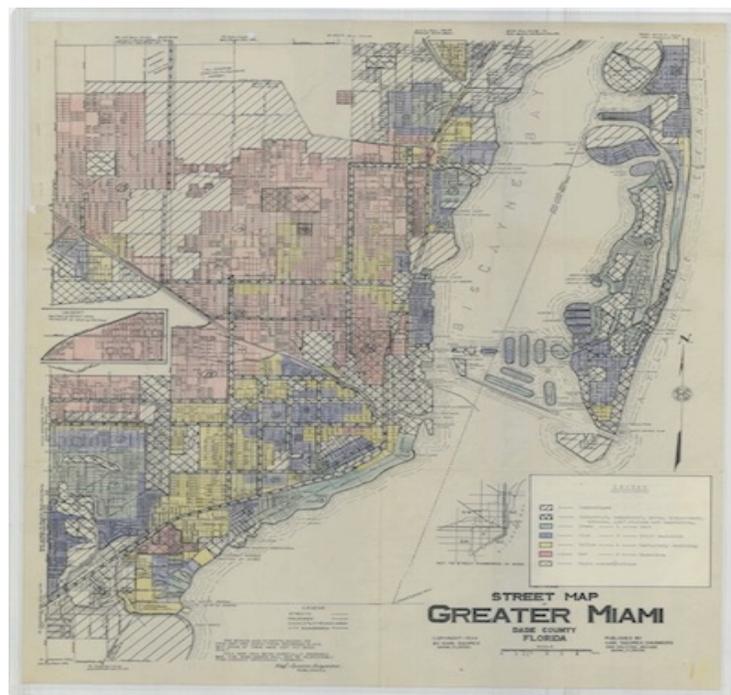
I was looking for a cup of coffee and a bite to eat between fieldwork observations and interviews in Miami’s Little Haiti neighborhood, and a quick phone search brought me to the nearest cafe, called Panther Coffee Lab and Roastery. Through the windows, I could see the warm lighting of faux-industrial fixtures hanging in neat rows from the ceiling and the bright wood of the barista’s couture countertop. An odd form on the local landscape, the cafe was otherwise surrounded by Unisex salons, where old signs greet customers in Creole and English. Papi Discount bodega and St. Michel Super Botanica were just across the street, with a few tables of wares outside, plastic brooms and wooden rosaries with saint iconography hanging side by side.

Like so much new development in poor Black and brown neighborhoods, cafes like Panther Coffee are not designed with local communities in mind. They are not made for the patrons of Papi’s bodega. St. Michel Botanica shuttered permanently a year after my visit. Geographer Samuel M. Stein explains, “A city that never changes is probably not a city at all.” However, a pattern of gentrification has been taking root, “one that presents itself as neighborhood revitalization but results in physical displacement and social disruption for the urban working class.”¹⁹¹ Moreover, neoliberal gentrification can mean appropriating difference as entertainment and selling it back to communities for profit. For instance, I met with some friends at a bar in the formerly resource-starved neighborhood Wynwood. Like the cafe in Little Haiti, it stood out. Its crafted aesthetic clashed with the old single-story houses that had languished along the railroad tracks for decades. My eyes squinted at bright pink neon lights framing a hanging mirror. Wooden statues of caricatured Black women with yellow hair wraps smiled at me in the

¹⁹¹ Stein, *Capital City*, 49-50.

entrance. Tarot cards and trinkets lined the walls. This was a *Botanica* shtick; selling us a version of Miami entrepreneurs had consumed and repackaged as spectacle.¹⁹²

Community members diligently document the gentrification crawling into their redlined neighborhoods, hiking up rent and dispossessing folks of the communities they have built. Yet, this latest wave of gentrification, they claim, is resulting from the proliferation and circulation of sea-level rise predictions, which are becoming increasingly accessible and a common resource in local policy making.



¹⁹² Baram, *Marketing Heritage*.

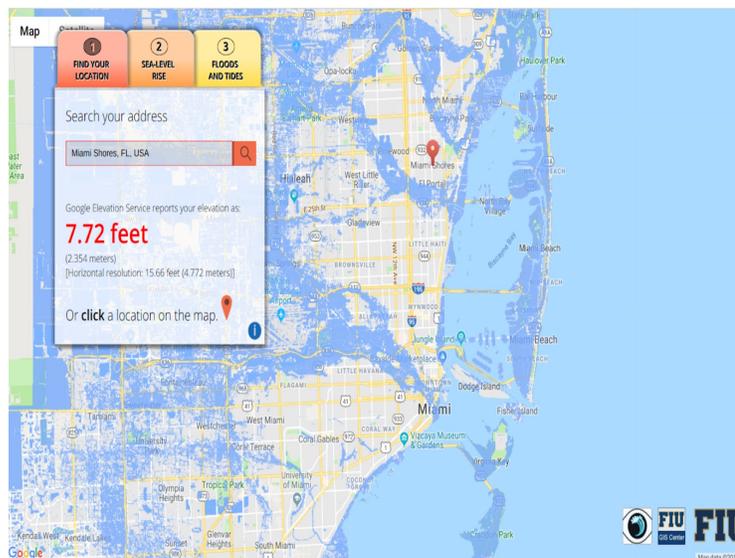


Figure 3.1 (top) demonstrates historic redlining and Figure 3.2 (bottom) future sea-level rise.

As detailed in my first chapter, the Southeast Florida Climate Compact’s 2019 predictions, which combine data from NOAA and the IPCC, estimate a median increase of at least one foot of sea-level rise by 2030, close to two feet by 2040, and up to four and a half feet by 2070.¹⁹³ This is a five-inch increase from the Compact’s 2015 update and may yet be a conservative estimate. Although climate change predictions render the coast’s environmental vulnerability immediately visible, “climate gentrification” allows us to conceptualize Miami’s long history of socioeconomic inequality alongside its environmental future. Climate justice organizers invoke hindcasts, rather than forecasts alone, to demonstrate how reactions to impact predictions are reproducing longstanding inequality through the seemingly objectively moral practice of climate adaptation.

Figure 3.1, the “Street Map of Greater Miami” (1935) shown in earlier chapters, circulates among activists in Miami alongside sea-level rise predictions. It is used to teach

¹⁹³ Sea-level Rise Ad Hoc Work Group, “Unified sea-level rise Projection: Southeast Florida,” *The Southeast Florida Regional Climate Compact, 2019*, <https://southeastfloridaclimatecompact.org/unified-sea-level-rise-projections>.

budding climate organizers and the general public how Black communities were pushed inward onto a geological ridge higher up and away from the coast, where they remain behind the entrenched redline to this day. As Valencia Gunder, a Black climate justice activist, told *The Root*, “Maybe where I grew up at, [the “Magic City”] was never magic for us.”¹⁹⁴ The 1935 map is used by organizers to demonstrate racialized proximities—who was allowed along the shoreline and in what capacity. Black and brown folks from inland neighborhoods like Little Haiti, Little Havana, and Liberty City still constitute the tourist and hospitality workforce in South Florida, making up a blanket majority of Union 355’s 300,000-person membership (Figure 3.3).



Figure 3.3 Image provided by and used with permission from “Unite Here!”, Local 355.

Climate justice activists want policy makers and developers to understand that their communities have been continuously vulnerable and forced to be resilient while living in the shadow of the “Magic City.” When the redlining map is placed next to a map of sea-level rise

¹⁹⁴ Jessica Moulite, “Color of Climate: Meet a Power Player in Miami’s Fight Against Climate Gentrification,” *The Root*, August 11th, 2017, <https://www.theroot.com/color-of-climate-meet-a-power-player-in-miami-s-fight-1797702979>.

predictions, the blue that once represented white-only property and the tourist industry's hotels, casinos, and entertainment complexes are consumed by blue ocean water. The land that remains are the geological plateaus that Black and brown communities were forced onto during Jim Crow segregation and where they remain today. These communities are now being bought up at an intense rate, following a market boom that is in turn following the warnings of sea-level rise predictions.

Miami's Magic City Innovation District (MCID), a planned city within a city, has already broken ground within the boundaries of Little Haiti. If pushed through as developers plan, the MCID shops, entertainment facilities, and residences will spread across seventeen acres of the Creole speaking neighborhood, with buildings as tall as twenty-five stories affording over 2,500 apartments for the upper-middle-class. Planners also hope to include a tourist attraction created by *Cirque du Soleil* and plenty of tree lined parks that, of course, had not otherwise been given to the Black Caribbean neighborhood.¹⁹⁵

Defined as an "innovation district," this new Magic City complex can be read in the context of this dissertation as a twenty-first century iteration of the envirotechnical sublime. The MCID, for instance, advertises itself as "the proving ground for the next leaders in digital design and high-performance tech solutions," "where global leaders, start-ups, local entrepreneurs, and incubator concepts collaborate and connect in a world dedicated to growth and achievement."¹⁹⁶ Additionally, this "walkable, campus-like neighborhood" is going to show Miami how "development and sustainability go hand in hand with state-of-the-art infrastructure, adaptive

¹⁹⁵ For insightful commentary on the development of mega-entertainment complexes in predominantly Black spaces See Paul Passavant, "Mega-Events, the Superdome, and the Return of the Repressed in New Orleans" in Cedric Johnson (ed.) *The Neoliberal Deluge: Hurricane Katrina, Late Capitalism, and the Remaking of New Orleans*, 87–129.

¹⁹⁶ MCID, "Home Page," <https://magiccitydistrict.com/>.

reuse properties, integrated public transportation” and smart building solutions.¹⁹⁷ In 2021, MCID added a section on its homepage dedicated to “Health and Wellness” subtitled “The Evolution of Living Well,” which describes the corporation’s goal of becoming “the epicenter” for “well-being standards” and “biophilic design,” or an urban and interior planning philosophy that centers human relationships to natural environments. MCID invokes all of the hustle of the original “Magic City” of Miami’s nascency while similarly promising to showcase the latest and greatest technological advancements for a new generation of wealthy entrepreneurs looking for a work-play paradise. Its website reads like a nineteenth century Florida booster’s ad, promising its audience everything—better overall wellness, “high-performance tech solutions,”¹⁹⁸ sustainable architecture, and notably, the most “cutting-edge” means of connecting to South Florida’s changing natural landscape. MCID is eerily reminiscent of Gökçe Günel’s ethnographic account of “Masdar City” in Abu-Dhabi. Her path breaking work describes how Masdar City, in many ways the original high-tech climate adaptive campus-like environment, attempted to brand itself as the world’s exemplar in sustainable design and experimental business ventures—even building a light rail transit system just for the complex.¹⁹⁹

Developers have been quick to claim that sea-level rise predictions have nothing to do with their choice to position the billion-dollar Innovation District project, but climate justice organizers argue that Little Haiti’s position on a geological plateau of thirteen to fifteen feet high provides a significant advantage given future sea-level rise. The MCID wants to change Little Haiti’s demographic and help the neighborhood “revitalize” through neoliberal desegregation.

¹⁹⁷ MCID, “Home Page,” <https://magiccitydistrict.com/>.

¹⁹⁸ I have no idea what new design philosophy this rhetoric is referencing.

¹⁹⁹ Günel, *Spaceship in the Desert*.

When I click the “Community” subheading of the Innovation District’s official website, the text reads,

In the last four years alone, Magic City Innovation District® – Little Haiti has attracted a diverse array of businesses, makers, innovators, entrepreneurs, artists and their respective patrons who are a dynamic and growing populace that spans all demographic and industry backgrounds. With every new storefront and new business opening, every painted mural and public art display, with every community event, we are witnessing a transformation.

In actuality, small Haitian-American businesses like Leo’s Cleaners (Figure 3.4.) are already finding their rents skyrocketing due to market speculation and on the edge of closure. They will be replaced by businesses who have signed leases with the MCID, like an “artisanal doughnut shoppe”; an infant clothing store that only sells 100% Prima Cotton; and a gym where an inground pool and oxygen tanks awaits athletes wanting to ride a bike under water.

MCID touts itself as a job creator for attracting these businesses. In exchange for the mass displacement of renters and local businesses and property tax hikes for the middle-class single-family households who remain, this new Magic City will facilitate “the creation of more than 9,000 direct and indirect full-time jobs” and “870 annual short-term construction jobs.” These numbers are a prediction, a forecast and a promise for Little Haiti’s future. Many of these jobs will be in the service industry. A “direct” full-time job means the employee will work directly within the campus grounds for one of its leased units. “Indirect” jobs involve those created by a trickle-down effect, according to District predictions. In other words, the campus will make Little Haiti attractive for yet more luxury businesses to develop, and those new businesses will need to hire new hands.

In this way, the new Magic City works almost exactly as the "Magic City" of the previous century. Finance and real estate tycoons buy up property for its environmental advantages—what once was beach is now, in part, higher ground—to create profitable entertainment complexes, simultaneously displacing Black and brown communities from these locales and then offering jobs in these complexes in marginal service positions.

We see here two competing moral narratives of Miami's climate changing landscape. In the first, the public-private nexus encourages desegregation of land on higher ground through neoliberalism, based on a fallacious argument that all parties will equally benefit from restructuring Little Haiti as an inland "Magic City". In the second, climate justice activists lay the foundations for a grassroots movement and discourse centering Miami's long history of racialized inequality alongside climate predictions.

Climate Gentrification: Building Climate Knowledge and Response at the Roots

Valencia Gunder, a well-known activist in South Florida, described during an interview how the term "climate gentrification" originated locally. She was at a "climate listening group" for low-income Black and brown communities run by a multi-racial coalition of climate justice activists, where the basics of impacts (like sea-level rise) and their causes were explained in accessible, vernacular terms. Experts were then expected to listen to and hear what folks had to say about those predictions. "I was just like 'Oh goodness,'" Valencia explains, "this is 'finna be a room full of white scientists from these universities sitting there telling us about climate change,' which I didn't want to do." However, she continues, "In all actuality, it was white scientists there, a lot of them, but they were not talking. They were allowing us to just express how we felt about climate change, really givin' us a time to talk about it."

The workshop made a lot of sense to fellow attendee, Paulette Richards. Richards began to connect the image of water slowly rising up to eat away Miami's famous coastline with the unending solicitations—knocks on the door, emails, phone calls—to buy her property.²⁰⁰ As she saw it, the real estate industry of the shoreline was clawing its way up, past the redline, and onto higher ground. Gunder recalled that Richards shared her insight with the group, “That’s climate gentrification!” Latching onto Richards’ utterance, Gunder brought “climate gentrification” to the founder of a nonprofit called CLEO, or Climate Leadership, Education, and Outreach. “And [the founder] said to me, you and me are gonna work together.”

Gunder received official CLEO leadership certification and then began organizing alongside climate justice activists working through other nonprofits like Catalyst Miami, to incorporate lessons on climate gentrification into their sea-level rise workshops. These organizations took up stabilized scientific predictions where they touched down (embodied by the “white scientists”), and used grassroots political tactics to reorient the meaning and use of climate predictions. They use “climate gentrification” to fold Miami’s long racialized political-economic history as the “Magic City” into present arguments about what its future should look like, refusing apolitical technical strategies (such as moving the coast inward, building concrete seawalls, etc.) that would allow the city to simply reproduce the status quo of inequality into the future, instead fighting major development like MCID.²⁰¹ Just as sea-level rise predictions are taken up as financial instruments for forecasting an investment’s future profitability on the developer’s end, these same predictions are appropriated by this coalition of activists as tools to highlight histories of social and economic injustice.

²⁰⁰ A. Harris, “Climate Gentrification: Is Sea Rise Turning Miami High Ground into a Hot Commodity?” *Miami Herald*, 2018, <https://www.miamiherald.com/news/local/environment/article222547640.html>.

²⁰¹ Hughes, *Energy without Conscience*; Günel, *Spaceship in the Desert*.



Figure 3.4 CLEO worker speaks with the owner of “Leo’s Cleaner” in French about the upcoming town hall.

Organizers have done the legwork to establish climate gentrification as an essential discourse in Miami’s governing resilience network. They began filling up times reserved for public commentary at legislative meetings when issues like zoning and allocation of bond funding were on the table, using Q & A time at major climate summits to educate an auditorium of people, hosting rallies and teach-ins, and, overall, demanding that city council members and Climate Resilience officers of Miami’s local government begin taking Black and brown communities’ vulnerabilities to the shifting desires of racialized capital seriously as a measurable effect of sea-level rise. Nonprofit educational programs like Catalyst Miami’s 11-week course on climate leadership, in which I enrolled, have laid foundations for such civic engagement by, for instance, dedicating class periods to teaching attendees how to communicate with legislatures through personalized storytelling rather than boiler plate speeches. Organizers have also literally pounded the pavement. I shadowed a CLEO worker passing out flyers for a Little Haiti town hall

meeting on sea-level rise, hurricane preparedness, and gentrification (Figure 3.4) and watched on as she spoke French with local shop owners.

I saw the power of “climate gentrification” and local sea-level rise education efforts evolve over two years of fieldwork, and culminate in a major 2018 Climate Summit, where several environmental justice activists were invited as keynote speakers by Miami’s Resilience government to discuss the threats climate change poses specifically to poor and blue-collar people of color. A Miami organizer recently commented that it’s now normal for people in power to at least include the politics of higher ground in hearings she attends, saying, “And I did that!”

Organizers’ concerted education efforts have concomitantly opened up climate science and local politics to disenfranchised communities. Gunder spends her days teaching folks in Allapattah, Overtown, Little Haiti, Liberty City, and beyond the science of climate impact predictions, the issues of climate gentrification, and, then, how to voice concerns to representatives and policymakers. Speaking about sea-level rise and hurricanes was new for Gunder, she explained, because they were “not something that people talk about often in low-income communities because there’s so much other stuff [to be concerned about]...Unfortunately, it’s still a taboo issue...and ultimately most people of color think this is a white people’s problem or a rich people’s problem.” Forefronting climate gentrification in public education efforts reverses such thinking by decoupling sea-level rise from their elite origins (i.e. the “white scientists”), and from a technocratic paradigm that frames the issue as a problem for scientists and engineers to solve. It instead grounds climate impacts in local histories and lived experiences through an ethical-political framework and a call for grassroots involvement in local politics more generally.

Overall, “climate gentrification” has become a modality for political participation, community building, and climate impact education. It is an ethical discourse that sees climate change predictions’ opening into the future as a new platform for building a more just and equitable political economy.

Accrediting and Coining Climate Gentrification

Still, many developers and real estate investors, and some policymakers, dismiss climate gentrification. They simply deny that sea-level rise science will play a role in real estate development and speculation in Miami any time soon—even as the city is in its tenth year building a bureaucratic infrastructure to ensure just the opposite, rewriting zoning and building codes to center sea-level rise adaptation in current and future capital projects. In this reframing of climate gentrification, admission—that a developer or consumer intentionally bought a piece of property in a historically redlined neighborhood because of sea-level rise predictions—becomes the standard of proof in a debate about whether or not climate gentrification is “real.” This reframing strips away the original ethico-political discourse of climate gentrification, and encourages headlines, like “Is climate gentrification really happening in Miami?.”²⁰²

I asked Valencia Gunder, what do you say to people who deny climate gentrification is happening? She responded:

[Developers and investors] have surveyors, they have people who come in to canvas the community, knows what's going on, knows about the land, the soil. Nobody’s coming to put billions of dollars into your community and they have not completely checked into it to make sure they are gonna get their full profit

²⁰² Mario Ariza, “Is climate change gentrification really happening in Miami?,” May 17th, 2017, <https://thenewtropic.com/climate-change-gentrification/>

from it. Come on! *Don't try my intelligence...*Is no way... they haven't had someone say 'Well, this is gonna be great because in 90 years South Beach is gonna be under water and Liberty City won't [be],'."

Gunder offers an apt observation. A smart investor, indeed a successful investor, does their homework. One might reasonably assume that developers and consumers in South Florida are keenly aware of sea-level rise predictions, as scientists have been casting a blue shadow over the coast's future for 20 years now. Investors and consumers are likely or *will likely* act on this awareness with investments pivoting toward higher ground, especially if banks begin to believe they will not be able to recuperate loans and insurance companies pull out of flooding areas. Yet, this conspicuous point about the basic principles of real estate speculation has been treated as too obvious to be true and in need of legitimating, corroborating research.

So much environmental justice organizing churns around the need to gather evidence and prove harm done, even when the harm done obviates itself across bodies and landscapes. For example, harm manifests in exceedingly high rates of cancer in a neighborhood next to a known polluting industry; yet these effects are legally diminished and industries are encouraged to proceed with business as usual, as occurred in "Cancer Alley," Louisiana and Uniontown, Alabama.²⁰³ Or when chemical pollution destroys an entire city's water infrastructure, yet citizens are forced into invalidating legal proceedings to prove malfeasance to argue for new clean plumbing (let alone financial recompense), as occurred in Flint, Michigan. The process to prove the obvious in environmental justice efforts often mirrors the endless labor of Black folks to "prove" the existence of anti-Black systemic racism in twentieth-century Western contexts—a process in which white folks in power disingenuously ask for more and more evidence while

²⁰³ Allen, *Uneasy Alchemy*.

maintaining recalcitrance and exhausting investigators.²⁰⁴ Work that explicates and fights environmental racism is low wage or volunteer labor trudged out of sheer necessity, because either the work being done to make environmental harm visible and knowable is incomplete or the work isn't being done at all. When the work is done, communities are forced to communicate with and produce evidence legible to legal and civic bureaucracies often stacked against them and dismissive of the knowledge they've created. *Why I'm No Longer Talking to White People About Race* dissects the indignity and danger of having to continuously make racism intelligible by standards of proof created by white people, and explains why Reni Eddo-Lodge, the book's author, opts out of reproducing this trap. "I cannot continue to emotionally exhaust myself trying to get this message [that structural racism exists] across, while also toeing a very precarious line that tries not to implicate any one white person in their role of perpetuating structural racism, lest they character assassinate me."²⁰⁵

Likewise, indigenous people around the world know the sheer lassitude brought on from centuries of attempting to contrive proof of sovereignty intelligible enough for majorities and state institutions. Elizabeth Povinelli notably documents the anthropologist's leading expert role in creating the seemingly endless configurations of evidence, or "monumentalizing abstractions," needed to legally cement Aboriginal land claims within liberal multicultural Australia. She analyzes what it's like, sitting with her Belyuen friends, listening to an archived tape of a death rite from 1948, trying to discern a legal argument for their land tenure rights, explaining, "Thus, we sit and face the archived past because we need someone other than ourselves to repeat what

²⁰⁴ Baldwin, *The Fire Next Time*; Bullard, et al., "Toxic Waste and Race at Twenty"; Washington, *A Terrible Thing to Waste*.

²⁰⁵ Eddo-Lodge, *Why I'm No Longer Talking to White People About Race*, xvi.

we desire, but someone whose words cannot be tarnished by the present because they are unmotivated by the present, by our desires to be worthy, to live.”²⁰⁶

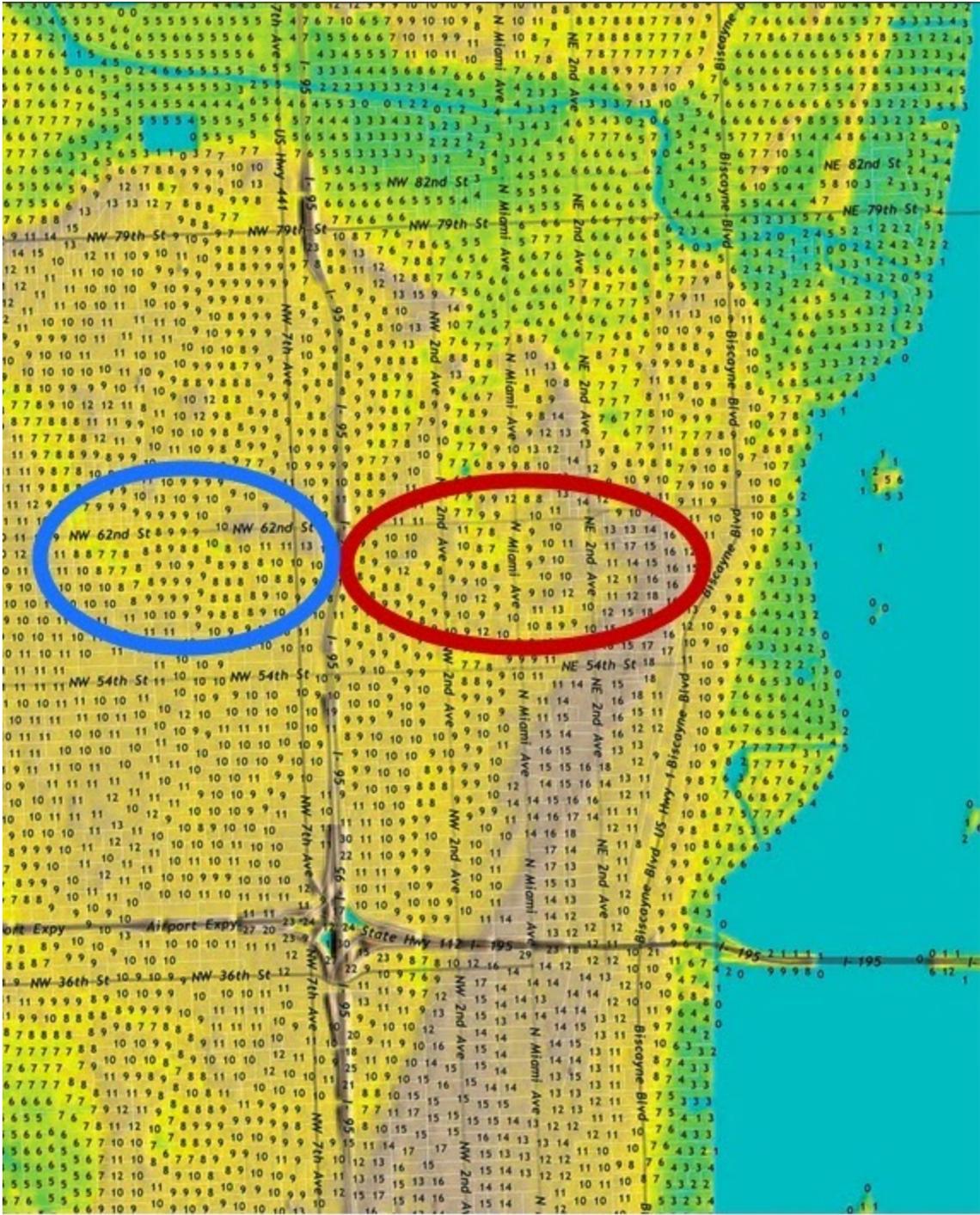
Experts often step in to bear part of this load.²⁰⁷ In the case of climate gentrification however, expert involvement quickly became a matter of appropriation and uptake into Miami’s hegemonic resilience government. More research across various social networks of science would be needed to validate “climate gentrification” as a fact. Confounding variables, like micro bubbles or busts in the real estate market, would have to be explained or assimilated into data collected showing movement from the shore onto higher ground. Researchers would have to carefully choose methods and variables, which would define the scope and limitations of the project. A sociological study of the media’s circulation of sea-level rise predictions could also add circumstantial evidence, perhaps positively correlating movement to higher ground with a heightened public awareness of climate impacts. Any conclusions would then be subjected to peer review through a credentialed social network. Even then, a researcher may still have to reasonably concede that sea-level rise predictions are one of a few primary causal factors of movement away from the shore onto higher ground.

Gunder describes her process of becoming a climate change expert as an awakening into a new political subjectivity. Yet, the process of learning to read South Florida topographically—or reading the geo-social history, political present, and climate changed future together—she describes as really just getting to know the officiated proofs of things she and her community already knew, even if they could not put it into recognizable evidence. Gunder needs an expert witness, “someone other than” herself, to prove what she already knows to be obvious.

²⁰⁶ Povinelli, *The Cunning of Recognition*, 227.

²⁰⁷ Allen, *Uneasy Alchemy*.

She is thankful for all her partnerships with scientist-activists, and especially her partnership with well-known (white) FIU social scientist Hugh Gladwin. “I’ve been all over the country screaming his praises” she tells me, “...I love him.” Gladwin has been working on mapping the race and class dynamics of housing settlement patterns in South Florida since the early 1990s, with a special interest in how major environmental forces (like hurricanes and sea-level rise), affect those patterns. In 2006, he was appointed onto a city climate change task force and, since then, has been asked to advise various branches of local government as to the potential sociological impact of hurricanes and flooding. As Gunder puts it, Gladwin “looks at climate change through an equity lens.” He situates himself prominently within South Florida’s climate governance infrastructure as a scientist-activist—naming himself as an activist—working to help systematically disenfranchised communities obviate injustice to those who do not understand for lack of context, or to undermine those who willfully misunderstand.



Numbers on map above show elevation in feet



(ref NAVD 1988)
 elevation data from
 SFWMD GIS
 South Florida Composite
 Topography, 50-ft DEM,
 rev. 1, 2014
http://www.sfwmd.gov/gisapps/sfwmdwebdc/data/view.asp?query=unq_id=2483

data sources for map on other side:
 Data with reference here to owners of 15 or more residential properties in area obtained from:
 Florida Department of Revenue,
 Property Tax Oversight Data Portal
<http://dor.myflorida.com/dor/property/resources/data.html>
 Data showing percent of residences in block that are rentals from:
 2010 US Census block data
http://www2.census.gov/census_2010/05-Summary_File_2/Florida/

data compiled and mapped by Hugh Gladwin. These maps are not copyrighted since the same GIS procedures and data can give different mapped results if done at different times

- | | |
|-----------------------------------|-----------------------------------|
| 4 BANK OF NEW YORK MILLON | 34 WELLS FARGO BANK NA |
| 5 ROCK INVESTMENT INC | 35 GREATEST ENTERPRISES LLC TRS |
| 6 PROFILE REALTY INC | 36 24 PLAZA CORP |
| 8 CASAS E LATAM LLC | 37 BOWERY PROPERTIES LLC |
| 9 COOKIES & CRACKERS CORP | 38 C B HOLDINGS LTD |
| 10 DEUTSCHE BANK NAIL TRUST CO TR | 39 TONY FORTE TRS |
| 13 EAST DOXE DEVELOPMENT LLC | 40 US RECOVERY FLORIDA LP |
| 14 CITIMORTGAGE INC | 41 BANKERS LENDING SERVICES INC |
| 17 BANK OF AMERICA NA | 44 RHA 2 LLC |
| 18 DALLAND PROPERTIES LP | 45 STEPHEN MERUELO |
| 19 DEUTSCHE BANK NATIONAL TR CO T | 51 PHOENIX HOLDINGS LLC |
| 22 JEROME & MARC SILVERMAN TRUNTE | 52 ANTHONY MERUELO |
| 23 JOSE RODRIGUEZ | 53 SUNNY ONE ASSOCIATES LLC |
| 25 FEDERAL NATIONAL MORTGAGE ASSO | 54 JERRY MERUELO |
| 26 PROFILE REALTY INC TRS | 55 FEDERAL NATIONAL MORTGAGE ASSO |
| 29 FETLAR LLC | 67 REFERENCE ONLY |
| 30 NOBIRTH BURNE | |

I sat down with Gladwin in his office at FIU's Biscayne Bay campus, tucked away in the brackish swamp of North Miami's coast. Gladwin has been concerned about sea-level rise in his hometown since learning the predicted impacts a couple decades ago. But it wasn't until 2015 - 2016 when the climate gentrification concept started gaining traction across social justice activist communities and making major headlines through interlocutors like Valencia Gunder that he decided to interpolate Miami's mounting climate resilience bureaucracy with a map. "I mean the overall purpose of these maps, you know," he tells me in his office, "... I guess I'd call it a community GIS [project] or something. If you want to give something people can use, you put it on a paper map. I mean, [all] people aren't going to have access to computers." He's both a scholar who specializes in understanding how environments, race, and class enfold, and a longtime resident of South Florida who has witnessed recent waves of gentrification taking hold in once undervalued and resource denied areas of Miami. For him, the concept of climate gentrification held intuitive merit. "I mean way before climate change gentrification, there's been other gentrification protests...There's sort of rolling gentrification coming in from downtown, pushing poor people out of these neighborhoods in the urban core. So that process has been going on for a long time."

Let's show people, he thought, let's give people an obvious way of understanding how vulnerable socio-economically disenfranchised communities located on higher ground will be super prone to mass sell-off, to environmental and cultural dispossession, when chronic flooding becomes a real problem for the coast. He humbly explains his process for developing the map, "I just wrote a computer program that looks up anybody that [owns] 15 or more properties in the area, and it pulls out and maps them. But anybody could do that. I mean, the data is publicly available." The maps in Figures 3. 5. and 3. 6. work together, the former demonstrating in stark

colors a topographic outline of South Florida, its numbers indicating elevation in feet above sea level. The later then plots those algorithmically identified clusters of 15 or more rental properties owned by a single LLC, LTD, bank, or investment corporation onto the black and white map to show how entire micro-communities are owned by these single entities—the map key for the companies identified is located on the bottom right of Figure 3. 5., the colorful topographic map. The gradations on the later black and white map also visualize the percentage of rental properties located in a neighborhood, darker squares indicating that 65% to over 85% of properties are being rented out. He points to these areas on the map, saying, “I mean that's the real map of vulnerability to displacement for climate change...You can look and see that 60 to 85% of the people living in that block are rentals, which means you're screwed if their landlord wants to come in [and sell the property].”

He went on, explaining, “This whole climate change thing and gentrification and displacement is all rooted in the same kind of historical crap, out of all that stuff.” The “stuff” being long histories of capitalist, white supremacist environmental history. “Poor people [usually] live in the more vulnerable areas and rich people get the less vulnerable areas. But because of all this history, we have this inversion here.” Gladwin’s maps knot together South Florida’s geological, topographical, social, and racial-classed histories, rendering these elements together as essentially dependent for knowing Miami’s contemporary climate politics.

Candid and self-deprecating, Gladwin expressed some doubts about this particular community GIS expert-activist artifact’s effectiveness. Characteristically tongue-and-cheek he laments, “I was at this meeting, strange meeting yesterday, but, um, I confirmed that that the sort of famous map that created my notoriety has never in fact been used with community people is as far as I could tell.” He apparently wasn’t aware, and I myself didn’t know until after my

interview with Gunder, the abridged nature of this version of events. Gunder's easy smile beams when our conversation ebbs to discuss Gladwin. She describes how she "became his map champion," flashing the mahi-mahi colored geological-political map "in every government official's face." "He finally heard the cry of the low-income community and finally gave us the stuff we needed to prove what we are saying!" For her, Gladwin provided a quintessential piece typical of the political puzzle of environmental justice activism that was clearly missing from the climate gentrification movement: proof. "He made us a map to prove climate gentrification," she tells me, "Because oftentimes it's like 'oh ya'll making that up' that's what we're hearing, that's not a real thing, *yes it is!* It's a real, real thing. And now we have maps, and data and science to prove it and that's all thanks to Hugh Gladwin. He gave us this information ...and I've been all over the country screaming his praises. Paulette Richards and Dr. Gladwin are the ones that birthed [climate gentrification]...I love him."

Yet, Gladwin explained to me during our interview that this map cannot *prove* by normative scientific standards that climate gentrification—the physical movement of capital and people in the form of development and block by block neighborhood buyouts from low lying areas to higher ground—is happening or will happen in South Florida. And this point has been reiterated by popular local news as well. A Miami based online newspaper, *The New Tropic*, used Gladwin's map in an article titled "Is climate gentrification really happening in Miami?," saying of it, "though the map doesn't prove the existence of height above sea level influencing speculation, it helps tell the story."²⁰⁸

This map isn't like a climate model for Gladwin—it doesn't give legitimate predictions. Climate models combine volumes of historical atmospheric and oceanic records with basic

²⁰⁸ Mario Ariza, "Is climate change gentrification really happening in Miami?," May 17th, 2017, <https://thenewtropic.com/climate-change-gentrification/> .

understandings of physics (how storm clouds gather over warmer waters, for example) to generate a multitude of highly likely future scenarios. Gladwin's map instead only brings to bear a few static values and their confluence within certain neighborhoods like Liberty City and Little Haiti: those neighborhoods owned by single corporations along the geological ridge inland. These are rental properties that *could be* sold off with the stroke of a pen and a handshake to developers looking to build away from chronic flooding and storm surge, but it is not proof that they currently are or will. Gladwin has only mapped "*vulnerability* to displacement for climate change." Why, then, does this map serve as unequivocal proof for Gunder? Gladwin offers his own interpretation of why his map may have struck a chord with a small cadre of climate justice activists, like Gunder. "[Maps are] symbolically important, I guess, because people feel like they have secret information about who owns which property."

Gladwin is clearly being a bit humble here. But his reticence to speak conclusively or laud the immediate importance of his work the way Gunder does stems from his reasonable need to stay firmly within the boundaries of legitimate knowledge production. After all, the credibility of whatever evidence he produces hinges on his respect for the boundaries of scientific research and experimentation. It's in fact what makes scientists like him so useful to causes like the climate justice movement. He is an accredited, respected researcher with multiple peer reviewed publications who has been asked to mobilize his expertise on behalf of local government projects a few times throughout his career.²⁰⁹ Various social groups trust and expect his claims will not stretch beyond the scope of his research, that his projects will remain focused on recognizable objects of study and avoid those objects that would at least require a great deal more values and methodologies to assess (e.g. intention and anti-black racism). This legitimacy is embedded into his map, and is, I think, the symbolism local activists are actually drawn to. There's a primacy to

²⁰⁹ See Peacock et al., *Hurricane Andrew*.

maintaining his legitimacy. People accusing activists like Gunder of lying or misunderstanding—“ya’ll making that up” —are leveraging a culture and political-economy of white supremacy that assumes doubt in people of color bringing structural forms of oppression to light (“speaking truth to power,” as activists often say). However, they are also leveraging normative scientific standards of skepticism against small, simple studies and claims to knowing something as ineffable as a person’s intention. When admission seems to be the agreed upon standard, how can Gladwin prove intentionality—that a developer purposefully bought a piece of property away from the coastline in a historically redlined neighborhood because of sea-level rise predictions—especially when developers and their advocates in city hall are publicly claiming they only want what’s economically best for all Miami communities? In this case, Gladwin cannot produce a legitimate projection. He can only demonstrate the *potential* for vulnerability to buyouts, and this potential isn’t convincing to everyone. The line of questioning usually ends here with the query, how could a particular mass buyout possibly be distinguished from any other? How can we prove that displacing a community demonstrates something beyond business-as-usual without proof of intent? Again, is climate gentrification *really* happening?

The limitation around intentionality and evidence looks remarkably similar to how we adjudicate racism, hate crimes, and environmental racism in this country. Admission becomes the only surefire evidence that can withstand scrutiny or alternative explanations. For thirty years, Robert Bullard has advocated redressing this problem of intent within tort law concerning environmental racism, explaining, that what is needed is a framework that “will allow disparate impact and statistical weights, as opposed to ‘intent,’ to infer discrimination,” which is crucial, because “proving intentional or purposeful discrimination in a court of law is next to impossible.”²¹⁰

²¹⁰ Bullard, *Dumping In Dixie*, 123.

Gunder, on the other hand, isn't here for equivocation. As an activist, she does not share Gladwin's limitations and asks us to not "try her intelligence." Because she is reading Gladwin's map topographically—not only with elevation in mind, but also with historical and structural relations overlaid—and because she is not beholden to standards of proof that discount her community's experiential knowledge, she is able to easily draw together South Florida's oppressive history of white environmental domination, its contemporary climate politics, and its sea-level rise futures together into the analytic of climate gentrification, and into Gladwin's map.

"Climate gentrification" for Miami activists is at once history and prediction. Gunder sees an obvious truth that stands on collective and personal history rather than only the balustrades of officiated scientific proof. She understands the uselessness of waiting on intentionality because she knows the mechanisms of inequality in this country have almost nothing to do with intentions and everything to do with lasting cultural, institutional, and physical infrastructures.

In 2017-2018 Jesse M. Keenan, at the time a lecturer at Harvard University, built a research team around the climate gentrification question—"is it real or not?" In 2018, they published a potential method for tracking South Florida's consumer preferences for housing in relation to elevation, moving discourse, according to Keenan et al., from "theory to empiricism."²¹¹ The method Keenan's team developed to measure consumer intention is the true contribution, why he can claim to be "the first to publish evidence of the existence of a climate change signal in a real estate market." Their presentation of theory, method, and data concludes soberly, stating "that the elevation of one's home in [Miami-Dade County] could matter in terms of long-term price appreciation," suggesting that "a consumer preference may exist in favor of

²¹¹ Keenan, Hill, and Gumber, "Climate gentrification."

higher elevation properties.”²¹² “Likewise,” they continue, “lower elevation properties may be subject to lower rates of appreciation due to flooding concerns. In light of accelerated [sea-level rise], these preferences may become more robust and may lead to more widespread relocations that serve to gentrify higher elevation communities.”²¹³ So, does sea-level rise factor into people’s choices to invest in houses on higher ground? According to Keenan et al., it may, and it could intensify. Is climate gentrification *real* then? The evidence suggests its real potential. The authors conclude with a call for further research, “A diagnostic understanding of [climate gentrification] provides another step in a long journey of adaptation that seeks to refine our understanding of vulnerability in the name of protecting our most vulnerable populations from long-term maladaptation in human settlements.”²¹⁴

As a co-founder of its Future of the American City Initiative, Keenan has a close relationship to the City of Miami. He has advised design teams and spoken at several sea-level rise resilience conferences on the economics of built environments and climate adaptation; thus, he is familiar with a cross section of the private and public sectors. Keenan’s research earned him a citation in a citywide resolution on climate gentrification, ratified in November 2018.

Resolution R-18-0501 instructs Miami’s city manager to assign “appropriate City of Miami staff to research gentrification” and to figure ways to stabilize property tax. The very next clause cites Keenan’s work as inspiration and justification for continuing to build knowledge about climate gentrification, to continue researching whether or not it is real and in need of attention:

“WHEREAS, according to Keenan, Jesse M., et al. ‘Climate gentrification: from theory to empiricism in Miami-Dade County, Florida.’ Environ. Res. Lett (2018), climate gentrification,

²¹² Ibid., 9.

²¹³ Ibid., 9.

²¹⁴ Ibid., 10.

while not officially defined, is based on the proposition that the impacts of climate change ‘make some property more or less valuable by virtue of its capacity to accommodate a certain density of human settlement and its associated infrastructure.’”²¹⁵

The committee on sea-level rise, Harvard’s Graduate School of Design, popular news sources, and Keenan himself claim he was the first to coin the term “climate gentrification” in 2014, as well as the first to officially explore it as a theory. From theory to empiricism to action, Keenan hopes to reproduce a common and proven relationship between expert mediators and policymakers, to reconstruct a narrative buttressed by inherent trust in scientific processes of discovery and their proximity as experts to legitimacy and accreditation.²¹⁶

Yet, neither the city resolution nor Keenan et al. mention local climate justice activists or any public input on climate gentrification. There is no discussion of the push from below from nonprofits like CLEO, Catalyst Miami, and the New Florida Majority or climate justice activists like Paulette Richards and Valencia Gunder, even though the resolution was created because of this community and the Keenan et al. article is made relevant by them. Further, the only solution suggested from above, indeed the only logical remedy allowed when reframing the problem as an ontological question resolved only by the light of evidence, is more research. This marginalizes the evidence of lived experience and history already presented from below, where knowledge was created and nurtured within its specific cultural, social meanings.²¹⁷

How was climate gentrification so easily appropriated? It was restaged as a performance in which experts speak, policymakers listen, and the “lay public” looks on, these roles being

²¹⁵ City of Miami, “Resolution R-18-050: File no. 4450,” 2018.

²¹⁶ Jasanoff, *Science and Public Reason*.

²¹⁷ Nadasdy, *Hunters and Bureaucrats*; Ottinger and Benjamin, eds., *Technoscience and Environmental Justice*.

largely defined by one's legibility as an expert and, therein, one's access to power.²¹⁸ An expert's validity is measured by their proximity to institutions of self-evident authority, such as government agencies, large corporations, and elite universities, as well as their abilities to reproduce the experimental method through these networks, often creating a product to circulate, patent, or coin as evidence of professional worth.²¹⁹ For instance, Keenan may very well have uttered the phrase "climate gentrification" in 2014, prior to Paulette Richards. But the need to forefront primacy, universalize, and "coin" the phrase only makes sense within a realm of knowledge production that values these things and treats them as real gains in a knowledge economy. They make little immediate difference for the people living with climate gentrification as it moves across their neighborhoods, recreating the "Magic City" on higher ground. Indeed, what could it even mean for Paulette Richards to coin "climate gentrification"?

A "lay person," on the other hand, is defined by their inability to access power and create valid knowledge within this technocratic performance. Climate justice activists may have cultivated histories, meanings, and policy plans around the climate gentrification concept, but these were not legible as knowledge to Miami's climate resilience government. Each—expert and lay—was formally allocated a role to play; the former operated with the authority of objectivity producing science, while the latter rallied subjective opinions in coordinated "political efforts."²²⁰ The former often embodies the authority of knowledge creation *because of* its positioning as a realm that refuse politics, while the latter can only offer "vernacular" or culturally specific knowledge because it has no direct access to objectivity but produces the

²¹⁸ Epstein, *Impure Science*; Hilgartner, *Science on Stage*.

²¹⁹ Gieryn, *Cultural Boundaries of Science*.

²²⁰ Latour, *Politics of Nature*.

“political context” that calls on experts to make an intervention into a theater of persuasion with legitimate proof.²²¹ The category “lay expert,” of course, complicates this binary, allowing for a nonexpert to enter into a field of knowledge, become familiar with its language, and amount some credibility. However, even then, their perspectives are not always invited, and when they are, the structure and standards of the conversation are defined by experts—the shape of the terrain of knowledge and the boundaries of the conversation are formed before laypersons take a seat at the table. This can be a problem when the experts involved, for instance, do not forefront the knowledge and histories of race and class inequalities generated “below” them as necessary variables for generating conclusions for policymakers. This is a normative structure of knowledge creation which, as science studies scholars and anthropologists alike have shown, can limit folks like Valencia Gunder from direct participation while reframing otherwise ethical and political conversations as simply matters of fact. Reframing climate gentrification and imposing limits to participation along the lines of expert/lay boundaries here allow policymakers to bypass the systemic nature of the region’s problems (i.e. rampant racialized inequality) and to avoid any challenges to South Florida’s current climate change adaptation plan, which prioritizes the region’s economic growth while ignoring a vision for a future with a more equitable political economy.

Keenan’s expertise is sought after in Miami. I witnessed this first hand at the Hinshaw and Florida International University’s Second Annual Climate Change and sea-level rise Conference in 2018, an annual forum for lawmakers, civil servants, and the private sector to speak openly about how climate change predictions will affect development and lending prospects. It was hosted at the Four Seasons Hotel in Miami’s posh, newly developed Brickell

²²¹ Haraway, “Situated Knowledges”; Hilgartner, *Science on Stage*.

neighborhood. The view from the conference room was stunning, and above us a rooftop pool and gardens waited, where we would attend a cocktail hour with Miami-Dade’s mayors and top CEOs.



Figure 3. 7 The top of the 4 Seasons in Brickell, Miami. Photo taken by the author.

Keenan’s participation in this conference panel demonstrates his positionality at the time within South Florida’s climate resilience network. As an expert on adaptation, he still serves as a hinge between the local government and private sectors. His work is trusted and readily taken up by this network. For the panel, “Development in a Rising Sea Level Environment,” he spoke in a matte voice that easily wove a labyrinth of economic jargon. Seated next to a private sector architect, a CEO of a major Miami-based sustainable development firm, a former Republican turned Democratic congressman, and a small-scale developer, Keenen argued in line with this

group that the only way to incentivize investors to build with sea-level rise in mind was for the public to leverage against its future tax revenues and provide major subsidies for private firms now. In other words, to get developers to invest in climate resilient buildings (e.g. constructing them higher, extensively storm proofing them, making them greener, etc.) and not with the *modus operandi* of quick returns with the lowest possible overhead costs in another more business-friendly city, South Florida needed to pay them. In order to advance these planned incentives, however, cities needed to begin building the required bureaucratic infrastructure today, implying major tax breaks for development and zoning flexibility.

David Martin, the sustainable development CEO on the panel, was well known locally for his continued advocacy of climate-smart residential and commercial infrastructure subsidies. During his panel talk, he advised focusing on building away from the flood-prone coasts and instead on higher ground in much higher “density” and “intensity.” “[O]ne of the big themes for us in development now...is how do we *not* have density and intensity in areas that are vulnerable to sea-level rise and try to aggregate and focus our density and intensity in areas that are less vulnerable.” Martin described sea-level rise as primarily a financial problem for the public sector, “I don’t see a lot of our elected officials looking at increasing property taxes on our residents. I don’t think that’s the right thing right now or very progressive. But I do see a lot of ways where we could create tax increment districts...to fund projects.”

Keenan emphatically agreed with Martin. “Professor Martin here [audience chuckles]...What we don’t realize is we have tremendous leadership in this community and the development sector unlike any other real estate development sector anywhere in the United States. The Adlers are long-term investors; David, his group, a number of others who are true leaders...David highlighted this thesis, that I subscribe to, is that the densification function is one

that we don't fully appreciate.” Density on higher ground can bring stronger tax bases with more certain longevity, which means more leveraging, which means more money for developers and for concrete adaptation infrastructure.

I asked the panel the last question of the Q & A. “Is there anybody in conversation with the actual stakeholders of these lower density, higher elevation communities—like Little Haiti? Are developers actually engaging these stakeholders and...trying to engage some sort of democratic process where they have a say in who gets developed what, where?” The question was notably different from those asked by engineers and entrepreneurs in the adaptation business. It was political. A subtle tension developed in the room. Their joint response was a resigned heeling to naturalized market forces. Gentrification, they explained, was going to happen inevitably and quickly. Adapting meant listening to the experts, finding money now to persuade developers to build some “inclusionary housing” (low-rent housing) along with condos and entertainment complexes for the wealthy, and finding mechanisms to somehow freeze property tax rates for communities already living in the areas. On the bright side, the money spent now on incentives would trickle back into these communities on higher ground because development would bring wealth for everyone. This rising tide raises all boats.

As they were responding, a troop of almost exclusively Black and brown servers dressed in white polyester button-down shirts quietly maneuvered around the room. Their dreadlocks and braids pinned back professionally, they set our plated lunches gently in front of us on the clean white linen and return to their hidden service corridors.

Legitimacy’s Ignorance and Anti-Racist Knowing

Climate knowledge circulates and builds, accumulating and altering meanings. But, at the point of circulation where science, capital, and resilience governance pick up climate gentrification, its central epistemic contributions are dropped: those concerning racial and economic justice. This interlocking system equipped by gatekeepers refashioned what was a potential political rupture into a narrative maximally amenable to a vision of Miami recreated again as the “Magic City”—a “resilient,” glittering, “innovative,” entertainment complex for (white) wealthy people to enjoy and for Black and brown folks to labor in.

Legitimacy begets ignorance here. Borrowing from Charles Mills, we may even claim that it creates a characteristically “white ignorance.”²²² For Mills, white ignorance is not a knowledge gap remedied with data, but an active reproduction of racialized dominance that denies information opposing white economic, political, and social supremacy, and does so with and without intention. White ignorance, for Mills, emerges through a dialectic between an aggressive epistemic-moral unknowing (i.e. a lack of knowing and accompanying “innocence”) and a hedged process of knowledge production (i.e. creating what becomes commonly known, such as popular histories). Its remediation requires a normative claim that white ways of knowing seek to reproduce dominance, and are fundamentally ignorant to the needs and desires of people of color, poor folks, and other marked categories.

For activists, the radical opening of the future created by climate predictions is sutured shut at the top, supplanted by a vision of more of the same. The anti-racist meanings, histories, and provocations built into the original climate gentrification concept are then treated as political context one can take or leave while pursuing hard conclusions—“real or not?”—that apparently have inconsequential meaning, given we already know the inevitable.

²²² Mills, “White Ignorance.”

Yet, what knowledge and visions for a shared future are cast away in the process of legitimizing and validating “climate gentrification?” My interview with climate justice activist Phalange Brutus is illuminating. Brutus is a young, first-generation Haitian-American man from Miami and Jacksonville. He splits his time between work as a small-time real estate agent and as an activist, and he currently lives and works in Overtown, a historically black neighborhood in Miami. I first met Brutus when he taught a climate leadership class during an eleven-week program I attended. He graduated from this same program, and he credits his knowledge of climate impacts to non-profit public education projects. He returns regularly to lecture to new cohorts and share his knowledge of climate vulnerabilities.

Gathered around his laptop, we begin the interview with Brutus opening a real estate search engine called Multiple Listing Service in his browser and navigating to a forum—restricted to licensed agents—that provides detailed price histories of all listed properties. In the advanced search, he enters addresses within Little Haiti. These properties’ histories indicate they were purchased and sold twice over the past two or three decades with relatively small incremental price increases. He then shows me Little Haiti properties listed at \$90-200K in 2012 that shot up to \$700-800K in spring of 2018. I am taken aback. Reading my expression, Brutus laughs, “Buena Vista is gonna blow your mind, I caught a heart attack looking at the prices for Buena Vista,” and enters the address of a property 12 blocks south of Little Haiti’s. This particular house had sold for \$66K in 1996, then it sold for \$106K in 1998 and was rented until 2015, when it sold for \$1.1 million.

This dramatic presentation of listing histories is not legitimate proof of climate gentrification, and both Brutus and I know it. He explains that we would have to conduct a long-term comparative study of property values closer to the shoreline, linking the devaluation of

those shoreline properties to the shift of consumer preferences toward property on higher elevation. Or in his words, “Now on the flip side of this...I would definitely want to look and see how the values of properties on Miami Beach is going down. Because that would totally be a telltale sign.” But he wants to show me these price jumps anyways, because he wants to illustrate something he *knows*.

When Brutus and I put away the search engine and dig into our conversation, we do not spend our time trying to sort out causal factors for these price jumps. We do not research whether or not they were spurred by more acceptable, normal forms of gentrification or Miami’s latest obsession with jumbo entertainment complexes, or sea-level rise predictions alone. Instead, Brutus weaves all of these causes together under the rubric of “climate gentrification,” into what he calls an “interconnected web.” He starts, like Gunder, with Miami’s history of redlining.

These neighborhoods forced onto the geological ridge—Overtown, Little Haiti, Liberty City, Allapatah, Buena Vista—were “forgotten,” he tells me. “People forget you...[I]f your neighborhood is forgotten about (schools), it’s forgotten about (food deserts), forgot about (banking). I mean it’s literally deserted.” These neighborhoods were segregated by government and business alike, he explains, and remained segregated until this latest explosion in real estate buyouts. Brutus claims that the majority of residents in these neighborhoods were denied access to consistent modes of long-term wealth creation—for example, good schools, access to quality food, and banks with non-discriminatory lending practices. “I am a capitalist,” he explains, “[But] there’s no true entry into the market like you [developers and local legislators] are selling. And so I love the system...but the actual system is not loving me...So, when the developer says that, you know, they have the right to [buy a] home, he is correct. But the bullshit is: why all the developers look the same?...The rules are written, but not for us.” Brutus identifies as a

hard-working real estate agent who wants to believe in the broader market system being sold to him by his local legislative government and financial sector—that buyouts are normal, that major development is revitalizing his neighborhood, and that luring wealthy non-Black folks into predominantly Black neighborhoods is the market’s strategy for desegregation. Despite this willingness to believe, his own reality dominates his view. The majority of the folks selling are Black and brown and the majority of folks buying “all look the same,” implicating the racialized capitalist structure of the "Magic City". He wants to believe that any individual has the right to purchase and sell properties within an equal, colorblind market. But the market has never been equal or colorblind and is, in fact, structured against his communities. He condenses and retells the narrative of climate gentrification from the perspective of a person of color living in either Little Haiti or Liberty City, expressing exasperation with the gaslighting and denial involved.

So check this out, so we’ve been resilient and dealing with what we’ve had to deal with in the neighborhoods. And you over here on the beach living the life. We over here suffering. And now that that shit’s not valuable you’re gonna come over here ...That shows you [they are being] deliberate [in their buyouts], it’s not ‘Hey! Let’s come in here and work together let’s stay together.’

Many climate justice activists like Brutus take issue with the governing concept “climate resilience” used by policymakers, bureaucrats, the private sector, and nonprofits alike. They reject the apolitical use of resilience and instead reinterpret the phrase in the terms of “climate gentrification.” For instance, as Brutus explains, without real entry into wealth creation, places like Little Haiti and Overtown are forced into a mode of constant resilience. “This resilience [in this community],” he says, “is not just from climate and environmental issues. Everything is

interconnected.” When a community is forgotten about, “...*whatever you’re able to do within this community is going to be considered resilient*” (emphasis added).

I was talking to someone who had very good intentions, who wanted to do some climate work in Overtown. And she was like, ‘How come people in Overtown ain’t worried about Zika?’ [because the spread of the Zika virus is connected to climate change effects]. The fuck is you saying? Are you serious? She kept going back [and saying].. ‘You know I want to teach people in Overtown about climate change’ ...*Overtown does not have a hurricane shelter*, you know what I’m saying? ...But you want me to forget about that, and say ‘You know what, forget about this hurricane shelter that was shut down in my neighborhood, forget about the fact that the county didn’t do any type of preparedness [for my community].’ And you want me to think about the bigger picture? I’m trying to live! I’m trying to survive!”

Here, Brutus relives a moment when opposing definitions for resilience were juxtaposed, creating a stark contrast for him. A climate change educator approached him about creating a forum for folks in Overtown to discuss climate health impacts. As he tells it, she had “very good intentions,” meaning she wanted to create this forum as a means of empowering the Overtown community with new knowledge to consider their climate changed futures. She was acting with altruism and urgency. But she wants to know why more of these folks are not concerned with secondary climate change effects, especially those that would affect mobile immigrant communities, like the future spread of Zika. To this he thinks to himself, “The fuck is you saying?,” or, how can you even ask that? It is an absurd proposition to plan for the possible

future of something fairly marginal like Zika when communities are battling for basic necessities, like functional hurricane shelters and access to groceries stores.

LA: They have the privilege to think in terms of 100 years: ‘Well, in a 100 years, we need to plan for a 100 years from now!’ And what you’re telling me is that we [communities of color specifically] need to plan for yesterday.

PB: You said it exactly what it is. These neighborhoods have been forgotten, by whomever or whatever, somebody dropped the ball.

During this exchange, I was reminded of a separate conversation I had had with Valencia Gunder about the fallout of Hurricane Irma in 2017, which was the most powerful storm to cross the Atlantic in recorded history. Gunder described how Irma caused widespread power outages in Liberty City. Drinking water ran low after a few days, and no one from the Red Cross, the county or city government was showing up in their neighborhoods. Gunder described to me how she phoned her grassroots climate justice allies, emptied out her savings account, and began buying non-perishable food items and jugs of water. Her crew ended up feeding people who hadn’t eaten in days and giving them something clean to drink.

The grocery stores were empty for three or four days. On top of that, even if you did have food you didn’t have electricity, so if you have food stamps, and because food stamps are on cards, credit card machines were not working—no internet, no food stamps. So I tried to explain that ..if you actually looked at it through an equitable lens, communities like Allapatah, Overtown, Liberty City, and Little Haiti, actually were more vulnerable than communities who may have been under [water near the coast].

“Climate is a threat multiplier,” she continued, “We have social ills in our community already and when you don’t fix those, when the storm comes, it makes it worse.” These are the meanings, histories, and present realities originally fixed to “climate gentrification” that facets of South Florida’s climate resilience, public-private nexus render anecdotal when restructuring and pursuing the problem as in need of “further research.”

Conclusion: “Don’t Try My Intelligence”

We lose a potential opening into a new future when we divest climate change discourses from true ethico-political challenges, when we make them colorblind and immediately amenable to city governments, investors, and developer’s visions of endless economic growth, and when we make them “innocent” of a place’s racialized inequalities; a white washing, in this case, laundered by science.²²³

A general fear exists in the U.S. context that, because science has fallen prey to partisanism, climate science needs to be rescued from politics.²²⁴ However, once “belief” in climate science is established, politics do not somehow disappear, as the case in South Florida shows. Just the opposite, from beginning to end, the conclusions of climate science are inherently political, requiring deeper responses. Calls to “depoliticize” end up leaving the field of facts open to those with access to power, allowing them control over our climate changed futures. If we truly want to shift the narrative of climate change from an engineering problem for experts to fix to an ethical challenge that requires significant epistemic, social, and political labor we must expect to engage the political tension between Black knowledge and white ignorance in

²²³ Baldwin, *The Fire Next Time*.

²²⁴ Hilgartner et al., “Was ‘Science’ on the Ballot?,” 893-894.

climate adaptation planning.²²⁵ As the conceptual arch of Chapters 2 and 3 attempted to demonstrate, science studies and environmental history are uniquely positioned to problematize (the oxymoronic) mega-sustainable Magic Cities currently developing across the country as well as other would-be climate adaptation plans that lack rich, bottom-up climate knowledge and responsible historical thinking.

To climate gentrification deniers, folks like Valencia Gunder respond, “Don’t try my intelligence.” Climate change predictions have wrenched open the future and are inspiring grassroots movements to imagine a horizon beyond the “interconnected web” of our current oppressive political economy and beyond courting developers in the pursuit of constant growth. Rather, they direct our vision to a hindcast, a reckoning with history, that ironically provides us with the tools needed to build better futures.

²²⁵ Niheu, “Indigenous Resistance in an Era of Climate Change Crisis.”

CHAPTER 4

Infrastructures of Denial and Economic Caretaking

“I do not believe that human activity is causing these dramatic changes to our climate the way these scientists are portraying it. I do not believe that the laws that they propose we pass will do anything about it, except it will destroy our economy.” — Senator of Florida, Marco Rubio²²⁶

This chapter shifts field sites to Florida’s capital, Tallahassee, and analyzes my fieldwork among scientists and civil servants working in the Florida Department of Environmental Protection (FDEP). The FDEP is a bureaucracy staffed and directed by the Governor of Florida. The agency is notorious for interpreting and responding to its own scientist’s climate predictions with denial and erasure. This chapter captures the state’s reaction to climate science, arguing that the institutional response of denial is best analyzed through the framework of infrastructural studies and agnotology. While the Southeast Florida Regional Climate Change Compact created an unprecedented multi-county compact to pool expertise and resources toward advancing technical solutions to sea-level rise, the Rick Scott administration created an *infrastructure of denial* under Governor Rick Scott’s tenure into the very branch of government created to protect valued environments and human relations with environments. In fact, the Southeast Florida Regional Climate Change Compact was developed by Miami-Dade, Monroe, Broward, and Palm Beach counties as a means of bypassing a state government that refused to accept the realities of climate change impacts as presented by local and national scientists and dedicate the requisite amounts of money and regulations towards emissions reduction and sea-level rise adaptation planning.

²²⁶ Brian Bennett, “Marco Rubio Says Human Activity Isn’t Causing Climate Change,” *Los Angeles Times*, May 11th, 2014, <https://www.latimes.com/nation/politics/politicsnow/la-pn-rubio-denies-climate-change-20140511-story.html>,

The previous chapters situate climate predictions across South Florida's particular socio-environmental histories and landscapes. This current chapter will further contextualize predictions by broadening the scope of what we have so far considered to be "local" and analyzing how Florida's larger state government has interpreted and responded to climate science. This shift in field site from Miami to Florida's state government in Tallahassee may seem like an abrupt exit from the specificity of place established in the opening chapters. To the contrary, as I demonstrate below examining the state of Florida's recent political history, and more specifically its efforts to create ignorance around climate science, adds depth and breadth to understanding the myriad and sometimes contradictory interpretations and responses to predictions occurring across the peninsula. Those in power in Tallahassee have isolated the state government from South Florida's climate scientists, activists, and governing efforts. The lack of state intervention—of good policy, resources, and funding—is a critical absence that frames climate action in Miami. While this absence and its specific effects remain to be studied, this chapter begins to answer how and why the state closed its doors to global warming scientists and created an infrastructure of denial that has strategically disengaged from the serious efforts to understand and adapt to climate impacts apparent within South Florida. As I hope to demonstrate, understanding this larger political history is as important to localizing climate science in Florida as understanding its environmental and socio-economic histories.

I conclude this dissertation's exploration of the relationship between climate knowledge and response through my infrastructures of denial analytic, which combines insights from infrastructure studies with critical agnotological theory. I use documentary analysis of the Florida Oceans and Coastal Council, as well as interviews and field note observations from my time shadowing civil servants working within the FDEP's Resilient Coastlines Initiatives, to show

how an infrastructure of denial was created, how it is maintained on an everyday basis, and who is doing this maintenance work.

If South Florida's public and private sectors have taken-up "resilience" as a useful discourse for building an infrastructure of belief.²²⁷ Chapter 4 unpacks how "resilience" has also become a discursive tool for the state government's infrastructure of denial. Denial is not only negation of knowledge. As scholars of agnotology, or the study of ignorance, tell us, denial can also be a creative act that requires labor and maintenance; and ignorance can be a tool that performs a service for those that invoke its power.²²⁸ Actors must often actively produce ignorance materially and discursively, as in the case of oil industries purposefully manufacturing doubt about climate change by marshalling their own experts to write and distribute reports through the mail that highlighted dissenting opinions from the overwhelming scientific consensus about human induced global warming, and funneling money toward political campaigns that inspire science denial.²²⁹ The first half of this chapter traces Florida's political history, from Governor Charlie Crist's acceptance of the science behind human induced climate change and his actions towards mitigation and adaptation to Governor Rick Scott's administration's extreme science denialism and their efforts to erase climate efforts from state government practice. The second half of this chapter then details the development of the Resilient Coastlines Initiative created during the last quarter of Rick Scott's tenure as governor.

²²⁷ I plan to elaborate on the concept of an "infrastructure of belief" within a book manuscript for this project. For now, it must suffice to say that South Florida's multi-county climate change compact, it's legislatures' openness to voting for adaptation policy and rerouting funding toward science based climate adaptation, the concrete infrastructural changes made to many cities, and it's political constituents' mounting attention to the issues of climate impacts exemplifies how an infrastructure of climate belief grows up around a consensus that cities must mitigate and adapt to human induced global warming.

²²⁸ Proctor and Schiebinger, eds., *Agnotology*.

²²⁹ Oreskes and Conway, *Merchants of Doubt*.

Analyzing the Resilient Coastlines Initiative foremost allows us to see how “resilience” does the work of denial; how it has become a discursive tool for the state to obfuscate the need for emissions reduction and act as if it is taking action towards adaptation when it is not. As I show, the Resilient Coastline’s Initiative is an adaptation of the state’s infrastructure of denial, a response to a changing political climate that actually serves to strengthen the disconnect between the state and those forces in South Florida working in earnest to address climate impacts.

Additionally, this chapter analyzes what vision of a good future for society and the environment—what ethical framework—undergirds denial, or the state of Florida’s strategic non-response to sea-level rise predictions, beginning from the premise that it is much easier to write-off politicians as greedy villains and their constituents (i.e. “those people”) as simply stupid pawns than to trudge the difficult and more complex road that opens up the real problem: that our political-economic system and its governing infrastructures are built to prioritize “the economy” above all else, and that non-responses, faux-responses, and tepid responses to climate change predictions, present on all sides, are often guided by this system of valuation. In unboxing denial as a material and discursive infrastructure that does things for people and institutions rather than merely an information deficit we open up opportunities for understanding disarming denial’s mechanisms. While the media has paid much attention to the political spectacle of belief in and denial of climate science, with pro-science and anti-science camps divided along bipartisan lines, this chapter contributes to science studies scholarship moving beyond this binary through nuanced ethnographic study and careful consideration for how our contemporary political-economic moment, and specifically the values and priorities it inspires, frames how state actors and everyday people on both sides of the aisle are responding to climate change predictions.

Let me provide an example of what I mean. I am from South Florida and so would often visit my family when I was down for long stints of fieldwork. My sister, my brother-in-law, and I would be standing around their beautiful, sunlit kitchen, talking and drinking coffee, with the kids usually outside enjoying the backyard that hugs an artificial lake connected to the Everglades. Inevitably the subject would come to my research. As the “expert on these things,” they would ask me a series of questions in progressively somber tones: When will we have to move? When will climate impacts become too dangerous to live here? How high will the water get on our property? After reiterating an overview of climate projections for their area (which isn’t good), we would then discuss the ethics of trying to sell a home one knows will be impacted by climate change. They would want to know specifically, “Give us a date,” of when it will be too late to put their house on the market, before all of this information about sea-level rise and category 7 hurricanes starts entering into common knowledge. We would debate whether or not they would be obligated to tell people that a 30-year mortgage is a pipedream in these environmental conditions, given that it is a buyer-beware market and no seller in Florida is legally required to disclose whether a home is located on a floodplain, let alone whether or not it will be on a future floodplain. “Should we just say fuck ‘em and sell to a Trump supporter in climate change denial?” my sister proposed. And then at one point my brother-in-law, Eric, asked, “Isn’t it better if we just don’t talk about climate change? Won’t talking about it just make the economy collapse?”

Beyond the culture of politics and the career politicians who pander to party demographics, there is a genuine concern, both from liberals and conservatives, for what will happen to the future of Florida’s economy that frequently overrides both scientific analyses and political concerns for democratic and equal societies. In this ethical framework, the kinds of

hurricanes I withstood as a small child are less of an anxiety than another financial crisis.

Examining the circulation of climate change predictions through Florida is much like looking at controversy in science: it elicits implicit assumptions, values, and politics.

In this case, it demonstrates that a liberal Democrat, like my brother-in-law, and someone like Marco Rubio might have more in common when it comes to responding to climate change predictions than one might first assume. The Republican senator of Florida, infamous for misusing geological science to claim that all climate change is simply a natural function of the earth's atmosphere, says that he votes against all policy of climate mitigation and adaptation on principle because those laws attempting to regulate the energy industry, increase taxes on the wealthy, create stipulations on development and real estate, and ask state and federal governments to spend the incredible amounts of money required for an adequate response won't do anything to deter the inevitable, but will "destroy our economy." Though not identical in their logic, the conclusions are remarkably similar: let's stop talking about what the majority of scientists say climate projections actually predict because it will put Florida's "economy," or its socioeconomic and political-economic status quo, more immediately at risk. As Robert N. Proctor says about the creation of ignorance, "the decision to focus on *this* is therefore invariably a choice to ignore *that*. The decision to focus on the economy can produce ignorance about the true intensity of climate change predictions and how it will affect people in Florida; it can determine what facets of climate predictions are deemed acceptable and which are not, despite what scientists are saying."²³⁰

Particularly interesting is the moral bent the argument for climate change denial takes here. Naomi Oreskes and Eric Conway have explored how lingering Cold War sentiments

²³⁰ Proctor, "Agnotology," 7.

spurred and supported initial climate change denial efforts, and how political leanings influenced the creation of ignorance about global warming.²³¹ The leading subjects of Oreskes and Conway's *Merchants of Doubt* mass produce ignorance for, they claim, the sake of preserving the purity of American democratic liberties. Similarly, senator Rubio and my brother-in-law hope to shield the socio-economic order from climate science by producing ignorance. Meaning, ignorance is clearly being used as a "strategic ploy," but there is an element of, in Proctor's phrasing, "virtuous ignorance," that makes the claim more powerful: an appeal to a greater good and a higher priority.²³² In this appeal for ignorance, the importance of protecting against unknown, yet supposedly inevitable economic impacts, supersedes acting on knowable climate impacts.²³³ "Protecting a vulnerable economy against crisis" is a narrative framework that, as Janet Roitman shows, facilitates the normal functioning of neoliberal capitalism. In post-recession Florida, avoiding "economic crisis" has become the guiding framework for interpreting and understanding socio-environmental problems. A political culture has now built up around either marginalizing or assimilating information, like sea-level rise predictions, into a system of valuation that prioritizes the economy through austerity and lauds exponential growth. Every potential "economic crisis" becomes an institutional justification for creating ignorance around climate predictions.

There are clear differences between Marco Rubio and my brother-in-law. Most obviously, they do not have equal access to power. Rubio is a Senator while Eric is a small-time ad designer. Marco Rubio's words and policy decisions affect millions of people; a single speech amplified through social media has the ability to affect public discourse on climate change while my

²³¹ Oreskes and Conway, *Merchants of Doubt*.

²³² Proctor, "Agnotology," 25.

²³³ Roitman, *Anti-Crisis*.

brother-in-law only speaks to his friends and family about his ideas. Additionally, we can assume they are operating with different intentions. While my brother-in-law here modestly suggests obfuscating sea-level rise predictions could help protect his home's real estate value and thereby his family's wealth, Senator Rubio is concerned about staying on the right side of his donors and getting reelected. Nevertheless, they are each drawn to the strategic ploy of virtuous ignorance, prioritizing economic caretaking over environmental caretaking, *because it is a powerful argument in the state of Florida*. The argument easily resonates within a culture that prioritizes major development over socio-economic security and endless economic growth over environmental stability. Additionally, the differences between Senator Marco Rubio and my brother-in-law serve to highlight this chapter's more general idea that there are important nuances to climate denial that require unboxing and analysis.

Ignorance has a “political geography,”: “Who knows not? And Why not? Where is the ignorance and why?”²³⁴ However, as my work shows, it also has a material and discursive infrastructure, or “institutional ecology,” just like knowledge, that lays tracks, creates compulsory momentum, and needs people to maintain it, as well as a corresponding ethical impetus, an undergirding justification for mounting some priorities over others.²³⁵ In what follows, I trace the infrastructure of denial as well as its ethical corollary, economic care, in the state of Florida's government under the tenure of Rick Scott (2011-2019) by following money—how funding is pulled, limited, and bureaucratized—and discursive regulation—how language around climate change was and still is quietly policed. In mapping out this infrastructure, I pose a similar question to Susan Leigh Star, “what values and ethical principles

²³⁴ Proctor, “Agnotology,” 6.

²³⁵ Star and Griesemer, “Institutional ecology, translations, and boundary objects”; Star, ed., *Ecologies of Knowledge*.

do we inscribe in the built inner depths of the information,” and, in this case of this chapter, an ecology of ignorance?²³⁶

“I am not a scientist”: Laying the material and discursive infrastructure of denial

In 2007, a year after former Democratic vice president Al Gore’s *An Inconvenient Truth* won two Oscars, Governor Charlie Crist signed three executive orders that would make the state of Florida a leader in climate mitigation and adaptation. The scientific consensus about the dangers of global warming impacts had been mounting exponentially throughout the 1990s, with the IPCC and NOAA producing more and more accurate data about how sea-level rise would cause massive flooding on the Florida peninsula.

The first Executive Order 07-12 Crist signed, titled Leadership by Example, ordered Florida government agencies to begin measuring and reducing their emissions rates. According to the U.S. Green Buildings Council, efforts to heat, cool, and, most significantly, electrify buildings accounted for 39% of the U.S.’s 2004 carbon emissions.²³⁷ State buildings in Florida would now be legally obliged to begin complying to the Green Buildings Council’s standards while working on becoming LEED certified, or meeting the council’s highest efficiency standards. The order also required agencies to halt purchases for high emitting vehicles and to begin introducing biofuel or ethanol-based transportation instead.

The second executive Order 07-127, titled Immediate Actions to Reduce GHG Emissions within Florida, made these emissions reduction standards statewide requirements. The overall vision was to reduce all public *and* private sector emissions “to 2000 levels by 2017, to 1990

²³⁶ Star, “The Ethnography of Infrastructure,” 379.

²³⁷ “Buildings & Built Infrastructure,” *EESI*, <https://www.eesi.org/topics/built-infrastructure/description>.

levels by 2025, and to 80% below 1990 levels by 2050”²³⁸ Importantly, this order included electric utility companies. This order boldly implemented regulations for Florida Power and Light who quite openly and comfortably maintained a monopoly on the state’s energy resources, coddled continually by representatives of both Democratic and Republican parties in Florida. Not only would Florida Power and Light have to reduce its overall emissions, it would be required “to produce 20% of energy from renewable sources, to reduce the cost of connecting solar and other renewable energy sources to the grid, and to enable net metering.”²³⁹ Yet, Order 07-127 does not stop there. It would also adopt California’s high motor vehicle emissions standards. Cars sold would have to be more fuel efficient than federally required.

The third Order, 07-128 titled Action Team on Energy and Climate Change would assemble a diverse group of experts—conservation scientists, coastal erosion researchers, city planners, representatives from business and industry—to develop an actionable plan to implement these orders by the end of the year, stating, “By October 1, 2008, the Action Team will propose a plan relating to adaptation strategies, reduction of GHG from new growth, carbon capture and storage technologies, land use and management policies, investments in climate-friendly industries, and others.”²⁴⁰ California governor Arnold Schwarzenegger met with Crist to publicly applaud his efforts, calling the fellow Governor “another action hero.” He went on to say, Crist proves “a Republican can in fact protect the environment.”²⁴¹

²³⁸ “Florida: Executive Orders,” *Lexology*,
<https://www.lexology.com/library/detail.aspx?g=490f4318-685e-4233-b011-dcee8cc6d15b>.

²³⁹ *Ibid.*

²⁴⁰ *Ibid.*

²⁴¹ Jim Loney, “Governor Signs Florida Greenhouse Gas Targets.” *Reuters*, July 13th, 2007,
<https://www.reuters.com/article/us-climate-usa-1/governor-signs-florida-greenhouse-gas-targets-idUSHO41492320070714>.

In an interview for *The Miami Herald* in 2015, Crist recalls about that time, “Back then, republicans in the [state] House and Senate, while not really enthusiastic, well, it didn’t really bother them. So it wasn’t that heavy a lift initially.”²⁴² A small polling effort commissioned by the Environmental Defense in 2007 demonstrated a favorable reception of Crist’s executive orders regardless of pollster’s party allegiances. The poll was positively reported on by the *Ocala Star Banner*, a newspaper located in an exceptionally red northern part of the state. “Of the 625 Floridians who participated in the poll,” the article reads, “eight in 10 Florida voters support Crist’s efforts to roll back Florida’s greenhouse-gas emissions to levels seen in 2000 in the next decade, and almost nine in 10 Floridians approve of Crist’s mandate for new cars sold in Florida to be more environmentally friendly.”²⁴³ The poll also reported that nearly an equal number of Republicans, Democrats and Independents in the survey claimed to want carbon emissions reduced across the board.

Whether or not his administration would make headway to bring these orders to fruition within the four years of Governor Crist’s tenure, these orders set a precedent and a standard for discursive norms around climate change predictions, or how legislatures in the state of Florida should discuss climate global warming. As my interlocutors in the state government remember, Crist was “leading by example.” Additionally, with the order Action Team on Energy and Climate Change, the state defined and codified the role scientists should have in the state when it came to emissions reduction and climate adaptation planning and the kinds of relationships policymakers should build with researchers and experts. His administration set up and funded an annual summit, which gathered over 800 local and national scientists, policymakers, and

²⁴² Koretn, “Florida’s Case of Climate Denial.”

²⁴³ Fred Hiers, “Most Floridians Support Crist’s Global-Warming Initiatives,” August 13th, 2007, <https://www.ocala.com/news/20070813/most-floridians-support-crist-global-warming-initiatives>.

business people, to "bring together the brightest minds" to openly discuss "one of the most important issues that we will face this century," as he explained in his 2007 state of the state address, additionally pledging to place the state of Florida "at the forefront of a growing worldwide movement to reduce greenhouse gases."

Prior to Governor Crist, Governor Jeb Bush passed the Oceans and Coastal Resources Act (hereon called the Act) in 2005 in response to President Bush's rejection of the Kyoto Protocol, or an international emissions reduction plan. The Act was mostly toothless—"encouraging" and "advocating" for certain kinds of research rather than stipulating legal requirements, strict timelines, and specific actions to take concerning Florida's oceans and coastlines. But, it also set some discursive precedence by openly recognizing "ocean variability" and climate change more generally. The Act, again, without creating any real policy, even goes so far as to saying that development should not come at the expense of vulnerable ecologies, stating "Development of coastal areas should be both economically and environmentally sustainable, and inappropriate growth in ecologically fragile or hazard-prone areas should be discouraged..." The Act even goes so far as to advance "exploring ocean-based renewable energy technologies and climate change-related impacts to Florida's coastal area."

The Act also created a special non-vocational group of experts and researchers called the Florida Oceans and Coastal Council (hereafter referred to as the Council). The Act stipulates that 10 specific environmental scientific fields must be represented within the 18-member council at all time: researchers of "wetlands and watersheds; nearshore waters or estuaries; offshore waters or open oceans; hydrology and aquatic systems; and coastal geology or coastal erosion and shorelines... resource management; wildlife habitat management; fishery habitat management; coastal and pelagic birdlife; and marine biotechnology." This council of experts was to develop

“a library to serve as a repository of information for use by those involved in ocean and coastal research,” which would serve as an open access hub for future research.

The Act tasked this group of wildlife managers and ocean researchers with monitoring and assessing potentially harmful risks to water quality and biology, renewing a sense of public environmental stewardship through education, encouraging local coastline recreational activities, and nurturing all marine life. More specifically, however, the council was designed to create a list, to be updated annually, describing and advising on what the state’s funding and policy priorities should be with regard to “changing environmental conditions,” like sea-level rise. Between 2005 and 2010, the council once convened throughout the year, and is still legally required, as long as the Act remains law, to produce an annual report with a numbered list of research priorities and attendant funding recommendations. The council received \$300K a year under both the Bush and Crist administrations for its basic operations, (i.e. “costs of council meetings and support staff to create an annual Research plan and oversee research proposals and contracts”), while it directed state funding in the tens of millions of dollars towards what they voted among themselves to be Florida’s top research priorities for the peninsula’s changing coastlines.

I had the great opportunity to interview Karl Havens, professor of Fisheries and Aquatic Sciences at the University of Florida, Director of the Florida Sea Grant, and an original member of the Council. In the spring of 2019, we discussed the development of the Council and its contemporaneous standing under Governor Rick Scott. “The Oceans Council started back when the political climate in Florida was such that the people in Tallahassee cared about the environment,” he began to explain. “That [care],” he continued, “facilitated something like [the creation of the Council] happening, which never would occur now.” He emphasized that the

Council played a significant role in beginning to gather and integrate ocean and coastal meta-data; it was the start of imbricating different studies to create a more comprehensive view of Florida's present and potential climate changed future. They also advised policymakers and civil servants working within the FDEP. "The council initially had a pretty decent budget," he explains, a budget for meetings throughout the year and for researching which projects should be funded first. "I think that the most important thing [we did], from my perspective, [was] we annually were required to provide a research plan for the legislature. And what the plan was supposed to do was tell them...the most important things...related to Florida coastal and ocean areas, [what] their agencies [should] be working on. Really it was to provide guidance for the [FDEP]. Like, 'Here's the top things that you should be focusing on.' Among all the things that you could be working on."

From my documentary analysis of all annual Council reports released to the public, I found that the Council made climate change research a top priority between 2007 and 2013, requesting that \$9.7M be allocated for research into "water quality, climate change, ocean and coastal ecosystems, and tools and technologies" in 2007 alone. During these years, the Council gave "Climate Change" its own section in the research plan they gave to the Governor's office, legislators, and FDEP experts. Within this section, they consistently explain that precise sea-level rise modeling, assessments into "the impact on fisheries productivity from changes in Florida's estuarine habitats due to sea-level rise" and predictions for "effects of climate change on coral reef communities" (which are seen as natural barriers to severe storm surge) should be prioritized for state funding. In 2009, the Council additionally published a report titled "Effects of Climate Change on Florida's Ocean and Coastal Resources," which was the only extant comprehensive

state executed and funded report acknowledging human induced global warming and its specific consequences for the Florida peninsula at the time.²⁴⁴

This report on climate change published in 2009 stands out as a particular point of pride for Havens. It was “a *carefully* peer reviewed report about how climate change is going to affect Florida, and in particular Florida’s coasts...I think the most valuable thing we did...was actually producing... those documents related to climate change...They were really good. They were really informative.” Havens stressed that the documents were so exactingly peer reviewed, and stood so well up to scrutiny, that Hawaii's Sea Grant program followed the structure and methods to create a similar report for the islands.

In the context of my study, the Council can be seen as acting at the state level within an infrastructure of trust, or a properly functioning “middle lane” between the fastlane of politics and the slowlane of scientific research.²⁴⁵ The Council was created to establish caring action for the environment, to help human-environmental interaction thrive, and to prioritize building knowledge about the future of both. Climate change—sea-level rise, storm intensification, increased precipitation, salt-water intrusion into freshwater aquifers—was being openly researched and openly funded, and treated as a priority by the state. And oceanographers, wildlife managers, coastal marine biologists, and other experts had an authoritative voice, a defined role, and an open channel to communicate with policymakers. Their knowledge, trustworthiness, usefulness, and purpose were not up for questioning. They asked and answered, what are the state of Florida’s obligations in respect to its historical promise to both maintain a healthy environmental status quo and reproduce a tax base? What does it need to know about

²⁴⁴ The Council then updated that report in 2010, what would be Crist’s last year in office, re-titling it “Climate Change and Sea-level rise in Florida.”

²⁴⁵ Eyal, *The Crisis of Expertise*, 7-8.

future environments? How should it craft its priorities to organize society and environment, together, ethically in Florida? The state created a material infrastructure, led by scientists, to support research that helped answer these questions and focused on caring for human-environmental relationships.

The Council, like Crist's executive orders, also created discursive norms, prominently featuring the phrases climate change, sea-level rise, or ocean variability in their reports. They helped make climate change a leading priority, 15 years ago and under two different Republican administrations in Florida.

In 2010, Governor Crist decided to run for an open Florida Senate seat rather than as the incumbent in the gubernatorial race. That year Republican nominee Rick Scott, a co-founder of one of the largest private for-profit healthcare companies, would win the Governorship. The fact that a decade prior Scott was forced out of the very company he created because his tenure saw one of the largest frauds against Medicaid and Medicare in U.S. history didn't seem to matter all that much to a majority of Floridians. He ran his campaign on promises to cut government spending, which he promised would "preserve the American dream" for Floridian children, and he delivered. For instance, in his first year alone he cut \$700 million from Florida's water management districts, which environmental activists argue has had cascading effects.

Governor Scott, however, is probably most famous for his systematic refusal to "believe in" human induced global warming during his tenure as Governor of a state rated most vulnerable to sea-level rise (just after Hawaii and Louisiana). When asked about whether or not he was worried about climate change impacts for the state of Florida, he would simply say, "I am not a scientist," implying that he could not act on climate impacts because he could not really know whether the phenomenon was happening or not. This was a powerful, in Robert N.

Proctor’s phrasing, “strategic ploy of ignorance”; a creative and politically tactful form of “manufacturing doubt,” similar in spirit to how Naomi Oreskes and Eric Conway describe major climate change denying organizations, like the Heritage Foundation, but different in form, as Scott simply defers the obligation to know rather than expending the effort to create misinformation.

In response to this pat reply, “I am not a scientist,” a group of scientists, including Ben Kirtman and Harold Wanless (Chapter 1), banded together to meet with Governor Rick Scott in 2014 and present him with a local scientific consensus on sea-level rise. The Governor allowed them 30 minutes of his time, thanked them, and had them escorted from the building. As Kathy Baughman McLeod, a conservation expert who served on the Florida Energy and Climate Commission, a commission effectively dismantled by Governor Scott’s administration in 2011, explained, “The science has been brought on a silver platter to Governor Scott, and he’s chosen not to do anything.”²⁴⁶

As soon as he took office, Governor Scott and the Florida legislature immediately began working to overturn Crist’s executive orders, as a means of fulfilling his promise to cut government spending and deregulate businesses. Specifically, Order 07-127 which, when implemented, would have sought to reduce building, utilities, and automotive emissions, was chipped away until it became utterly meaningless. The climate action teams were disbanded, and experts working on regulating energy and infrastructural development in line with climate change predictions were moved around, many of them, oddly, into the Department of Economic Opportunity.²⁴⁷

²⁴⁶ Dennis and Fears, “Florida Governor Has Ignored Climate Change Risks, Critics Say.”

²⁴⁷ Korten, “Florida’s Case of Climate Denial.”

In Florida, the Governor staffs the FDEP and is also in charge of approving and securing funding flows for creating and maintaining its programs and initiatives. Governor Scott's administration and the state's legislature quickly began building an infrastructure of denial throughout the FDEP, beginning with limiting discourse and knowledge sharing on climate change, quietly using pecuniary resources and job security as leverage against those wanting to talk about human induced global warming and its impacts. In fact, Scott's first 4 years began with an unofficial gag order against the phrases "climate change" and "global warming" throughout the FDEP. The gag order was eventually brought to light by a series of whistleblowers working in the department. A video clip of a whistleblower circulated through social media at the time. It shows an expert working in water management standing on a beach, the wind whipping through her hair, as she tells the newsperson, "We could just say, 'The water's getting hotter.' We couldn't talk about why the water's getting hotter...At some point it was mentioned that sea-level-rise was to be referred to as 'nuisance flooding.'" And then reports and programs were renamed. For instance, the "Climate Change Action Plan for the Florida Reef System," set into motion by Governor Crist's administration, was renamed "The Coral Reef Conservation Program." Some monies for flood mitigation and beach renourishment continued to flow. However, these initiatives were already part of the long-standing work of coastal and water management programs, which had been around for decades. Any new initiatives would necessarily refrain from referring to or even implying the legitimization of human induced climate change. "Adaptation" became a new watchword among experts and bureaucrats looking for funding approval for projects. For example, an initiative may be created to help restore marine ecosystems that shield vulnerable coastlines from increased storm surge caused by sea-level rise, but the proposal would need to instead describe how that initiative would help

vaguely “adapt” a coastline to “environmental changes.” Additionally, the water bubbling up from drains on South Beach’s main drag no longer portended a climate-changed ocean. It was now to be referred to as “sunny day flooding.” With the exception of a single document published just before Rick Scott took office in 2010, all references to climate change were wiped from the FDEP’s website. It was as if those governing Florida suddenly became extreme nominalists or constructivists, refusing to invoke the name of the devil for fear he may appear.

It did not take long for the Council to be defunded. Though the members are still legally obligated to produce annual reports under the Ocean’s Act, Governor Scott’s new administration and Florida’s elected legislature terminated their funding. Havens remembers, “Governor Scott did, actually, work with the legislature to abolish a lot of things like this...The agencies that used to deal with environmental issues have been so gutted in terms of staff and budgets that even if they want to do the right thing, they can’t anymore. And I think that was intentional.” Big comprehensive reports and extensive collaborations that cut across disciplines, sharing resources and knowledge, became increasingly difficult. The Council began to organize and published personalized letters on the FDEP’s website, addressed to Governor Rick Scott, directly requesting funding.

In 2010, BP’s egregious neglect of its Deepwater Horizon rig led to an explosion which killed 11 people and billowed seemingly endless clouds of raw, black oil into the Gulf of Mexico. In a macabre twist, the \$8.8 billion settlement the federal government reached with BP became a ray of hope for the Council. Perhaps, they suggest in their 2015 annual report, the Governor and legislature can appeal to the Natural Resource Damage Assessment Trustees, or the organization in charge of managing the settlement money, to siphon the funding for climate change research that the state of Florida refused to provide. The Gulf of Mexico has been

irrevocably, physiologically changed by BP twice over: specifically by Deepwater Horizon's failure and then also by the many other *successful* oil extractions leading to refinement, proliferating greenhouse causing emissions, thermal ocean expansion, and melting Arctic ice.²⁴⁸

Looking to BP's meager payout is an admission that environmental scientists in Florida are better off reaching toward a one-off liability settlement with an oil company—which will be allowed to carry on, business as usual—than negotiating with its government for continuous and sustainable support.

During Scott's administration, the Council's language also begins to shift from "sharing our collective resources," operating with "the best science available, the expertise of hundreds of scientists and resource managers, and our collective commitment," and protecting "the health of our complex ocean and coastal ecosystems and secure an ocean legacy for future generations" to explaining in a personalized letter to Governor Scott that their research plans will provide "survey data critical to the sustainable management of Florida's multi-billion dollar a year fishery," among other capital resources. Havens told me, "When we go up and meet with members of Congress now, I don't go and meet with a member of Congress who is a Republican member and then tell him that we're studying resilience of communities because of sea-level rise. My God, you know, I'm not an idiot! [Instead], I take the owner of Acne Sponge Company with me...and he goes up and tells them that it's our program that saved his business, and then we tell them other stories like that." The Council itself had to adapt. The discourse and purpose of the Council must, on the surface, explicitly shift here from caring for the environment to caring for the economy.

²⁴⁸ Funk, *Windfall*.

In the Council's 2015 report, the phrase "climate change" was edited out and not by Council members. As Havens explained, "We weren't being pragmatic. It got done to us." He remembers distinctly the exact phrasing the Council had chosen that year—"climate change"—because they had voted on whether or not to use "global warming" instead.

"In the document that the council members approved by vote...climate change was all through the document and after we approved it by a vote, it was taken out and changed without our knowing about it. And when we found out about it, we had a special telephone call about what to do and how to complain. And then I don't remember what-exactly we did. Except that I know that several members of the council quit...After we voted on the language being the way that it was...they changed our report internally within the agency [the FDEP] without telling us they had done it."

Scott's administration and his appointments within the FDEP continue to deny they placed a gag order on global warming. However, along with the complete dismantling of Governor Crist's executive orders, the Council's diminishment strongly indicates an intentional reordering of the state away from the authority of science and toward total prioritization of economic growth. What will happen to the real estate market or to Florida Power and Light if this information gets out? Will developers want to keep building mega-condos along Fort Lauderdale beach? And what of the tourist industry? Here, denial is not only a negation: it acts towards an ethical imperative that centers "the economy." If we *should* always put the economy and the market first by cutting government spending and protecting the liberties of the private

sector, climate denial allows for those things to happen. It also provides an imagined future where endless economic growth can continue uninhibited. Denial protects that ethical ideal.

The changes across Florida's government were systematic and, in regard to the Council's defunding, potentially illegal. Havens tells me to this day, by law, the Council called the Florida Oceans and Coastal Council made up of different designated expert groups must meet and produce a document every year. "The legislature would have to present a new piece of legislation abolishing the council for it to go away. Long after we're all dead, if no one does anything, there will still be a Florida Oceans Council." He tells me today the Council, or whatever remains of it, lays low, arranges a phone conference once a year, and copies and pastes its previous years documents into a fresh PDF in order to fulfill its legal obligation.

Telling the story of the build up of climate "belief," or the acceptance of certain kinds of predictions as well as the ethical imperative to action embedded in that knowledge, and then its eventual collapse under Governor Scott's tenure allows us to begin mapping the contours of the state of Florida's climate denial infrastructure, highlighting how the administration's control of climate discourses and state funding built ignorance into policymaker's relationships to scientists and expert advisors. It, in fact, reshaped the state of Florida's relationship to scientists and scientific authority. The use of "infrastructure" here is analogical, but it is also literal. Denial has a material and discursive infrastructure. Government programs working explicitly on climate change mitigation and adaptation were renamed and sent to work in separate government buildings; some initiatives, like the Council, were defunded entirely or had their funding cut so that their impact would be purposefully limited and controlled; people were fired or they resigned in protest; documents were edited and the FDEP's website was scrubbed for references to climate change and global warming. The next section will examine how the state's obfuscation

and forthright erasure of information and relationships to experts transformed into controlled transparency, a different kind of operation of ignorance, and go into more ethnographic detail of what this infrastructure functions on the everyday level.

The Resilient Coastlines Initiative: How Transparency Can Strengthen an Infrastructure of Denial

I took up Susan Leigh Star’s call to “study boring things”—“the forgotten, the background, the frozen in place”—when choosing to examine the state of Florida’s recent history of interpreting and responding to climate predictions.²⁴⁹ Understanding how priorities and values are institutionalized requires opening up a black box of bureaucracy—examining and analyzing paper pushing and box ticking mechanisms of order and control. It meant coming to understand tedious money management practices, contractual relationships between cities and their states, and general accounting; it meant “restoring narrative” to these seemingly mundane objects.²⁵⁰ Something like an infrastructure of denial is a living thing, and mapping it out in more detail can tell us something more generally about the relationship between knowledge and ethics, what gets prioritized and how ignorance works to manage those priorities.

Everyday, Florida’s environmental future is cared for through a bureaucracy called the Florida Department of Environmental Protection (FDEP). This bureaucracy is both a means for mobilizing a caring human relationship with the environment, and, as David Graeber explains, is itself the product of a vision of a more perfect social, political, and economic future. Graeber characterizes bureaucracies as “utopian” visions driven by modern positivism.²⁵¹ We want

²⁴⁹ Star, “The Ethnography of Infrastructure,” 379.

²⁵⁰ Ibid., 377.

²⁵¹ Graeber, *The Utopia of Rules*.

institutions to do things, like hold people accountable, adjudicate contracts, and issue licenses to ensure credibility and consumer protection. Moreover, we want all of this done in a cost-effective way and at an efficient pace. As Graeber also explains, despite the spectacle of politics, of grand standing on all sides, the real *action* of organizing modern societies and governments happens during meetings in windowless conference rooms lit by fluorescent bulbs. It happens at the FDEP, in sparse cubicles located in buildings where the security guard tells you to sign in and wait so you can be escorted up elevators and through grey labyrinths that smell like warm copy paper and centralized AC.

In 2015, under the new watchwords “adaptation” and “resilience,” Governor Rick Scott signed Senate Bill 1094, “An Act Relating to the Peril of Flood,” into law. The bill requires all municipalities to include sea-level rise predictions as a flood risk in their comprehensive planning, which would require cities to create flood vulnerability assessments, or reports mapping out exactly how a city landscape may be affected by sea-level rise, as well as the potential adaptation infrastructure that the city may need to mitigate those effects. In order to help all of the state’s approximately 200 coastal cities create these sea-level rise assessments, the FDEP took a very limited amount of money allocated by the Governor—\$2.3 million—and created a granting program, called the Resilient Coastlines Initiative. The FDEP hired two staff members, Elizabeth, a biologist, and Zoe, an accountant, to slowly dole out this money in the form of small, bureaucratically monitored grants.

In this section my research will show that the Resilient Coastlines Initiative allowed for an extremely limited revival of climate change discourse and material infrastructure to support adaptation assessment, all the while allowing policymakers to keep mitigation (like emissions reduction) and financial and expert support for actually implementing adaptation engineering in a

way equal to the level of threat relayed by climate scientists out of conversations entirely. The Resilient Coastlines Initiative functioned as a mechanism that allowed policymakers to appear transparent about climate science and responsive to impact predictions, while actually doing very little to achieve either, especially when viewed in relation to the growing magnitude of predicted climate impacts for the peninsula of Florida (Ch. 1). Rather, the creation of the Resilient Coastlines Initiative mired the otherwise intensely political and economic issue of climate change science in a bureaucratic system under the Governorship's total control. Its pretense served as a tension release valve during an election year, where Rick Scott ran for a seat in the Senate and won. It did so by *managing* knowledge and action around climate change instead of flatly dismissing the science, creating a new kind of ignorance out of transparency Robert N. Proctor might call "organized duplicity."²⁵² It transformed climate change from a matter for scientific research, application, and policy, as demonstrated with Crist's Orders and the creation of the Council, to a matter of bureaucratic money management. Rather than defer to oceanographers or city planners, the Governor would now turn to a really good accountant for advice on how to spend a little allocated money. Care for the environment under the Crist administration transformed into care for the economy under Governor Scott's.

I was given the opportunity to shadow the two people who staffed the Resilient Coastlines Initiative, Elizabeth and Zoe, as they began their work at the FDEP.²⁵³ The Resilient Coastlines Initiative was, in 2018, one of two initiatives operating within the 8 years of Governor Scott's tenure dedicated to educating city governments on the coming dangers of sea-level rise

²⁵² Proctor, "Agnotology," 21.

²⁵³ The names have been changed to protect the participants.

and channeling funding towards adaptation efforts.²⁵⁴ I first reached Elizabeth while searching for active members of the Council. In due course I found that there were none, but I left my name and number with a few staff at the FDEP during this search, explicitly using the phrase “climate change” when referring to my research. Elizabeth called back, leaving a voicemail that said, “I believe you’re looking for me.” I was surprised because in two years of fieldwork I hadn’t heard of the Resilient Coastlines Initiative. “That’s because we’re brand new,” she would eventually tell me, “we don’t even have a website up yet.”

I interviewed Elizabeth and Zoe and observed their work over the course of three days at the FDEP offices in Tallahassee. Elizabeth is foremost a biologist with a background in zoology and botany. She found a job planning for wildlife adaptation to climate change effects in the Southwest Florida Regional Planning Council after returning to university later in life. In 2009, she was an active participant in the Crist’s administration’s climate change summit, where expertise from far flung fields gathered in a massive brainstorming session for climate change mitigation. When Governor Scott was elected, state and federal funding for efforts like the local wildlife adaptation planning she was working on began to, in her words, “downward spiral” and Elizabeth started looking elsewhere for employment. She was hired to direct the Resilient Coastlines Initiative, where her background in the basics of climate science was helpful for educating municipalities about climate predictions.

However, she very quickly realized that the position had much less to do with adaptation planning than with policing the expenditure of the allotted \$2.3 million for sea-level rise assessments and minimal assistance for sea-level adaptation projects. Elizabeth immediately

²⁵⁴ The other was the vestiges of the Crist administration’s adaptation planning efforts that had been sequestered away in the Department of Economic Opportunity by the Scott administration. This group of civil servants used their limited available resources and created a “Post-Disaster Redevelopment Planning” manual (63 pages in total) for cities to follow when considering how to rebuild “resiliently” after major disasters, among other small ongoing projects.

sought out someone like Zoe with a strong history in money management, who would know how to navigate this highly bureaucratic process. Elizabeth tells me, “When I was hiring a contracts and grants manager, I said, ‘So there's a reason that a fifth generation Floridian never learned to clean fish. It's cause I don't want to clean fish.’” Zoe nods, “She handles all the science and stuff. I handle all the paperwork.”

Elizabeth spent much of her time reaching out to coastal cities in Florida and “reestablishing a connection” that had been cut off throughout Governor Scott’s administration. She was in charge of letting municipalities know that the initiative existed, and traveling to speak at legislative meetings, town halls, and conferences about sea-level rise vulnerability assessments and the need to begin building adaptation into planning. Plans for mitigation and emissions reduction, like those prompted by Crist’s Executive Orders, were a hot political issue that should be avoided. Elizabeth wanted to say more. She would share “personal opinions” with me throughout our interviews, and she, personally, saw sea-level rise as a grave and immediate threat that needed to be funded in terms of billions of dollars and without stipulation. However, as she explained, “people” were not ready to talk about the real changes mitigation calls for, and that the discourse of adaptation and resilience were the “baby steps” required for the current moment. Shadowing and listening to her, I got the sense that Elizabeth, like many experts working as civil servants within the FDEP, were pushing the ethical imperative towards action inspired by climate change predictions to the surface within the state government as fervently as they possibly could within the structure provided; they pushed up to the edge of losing their jobs. In 2017, adaptation and resilience became viable terms, and so Elizabeth was going to use them to the best of her ability to get people to act, totally aware that these baby steps were moving forward from a point of serious regression.

Once Elizabeth captured a city's attention, spreading the word about adaptation, those cities applying would be worth their time and resources would then begin to submit a grant application. Zoe would then take the reins, leading applicants through a lengthy and complicated bureaucratic process of obtaining financial assistance. The bureaucracy dictating the Resilient Coastlines Initiatives capacity ensures money is conserved and that its expenditure is highly regulated.

Elizabeth and Zoe built the structure to process grant applications and contracts with cities from the ground up through a tangle of institutional rules in order to give away money. For instance, some of the \$2.3 million was state money and some was federal, with different stipulations, like timelines and expenditure limits, attached to each. Zoe was the person working to figure out how to make sure cities filed applications correctly to meet all requirements to receive funding. Different funding channels—state and federal—require different kinds of contracts. Elizabeth calls the endeavor “a tale of two fundings,” a Dickensian ordeal. “I know what to ask a community to do,” she told me, “but I don't know the mechanics of how to give them the help that they need. I mean, I could sit with them and walk them through it and we can talk it out. But what they need is consultants and they need money. So I don't know how to give them that money...Just figuring out how to give them the money is just incredibly complex, incredibly complex.” Even Zoe, a professional accountant, had to go around asking colleagues, “How do you give away state money?” because while she was familiar with “procurement”—asking other institutions for funding—she now had to “solicit,” or ask people if they needed the money from the Resilient Coastlines Initiative. After getting in touch with a particular municipality, Zoe is then responsible for figuring out the cadence of that city's particular bureaucracy. For example, if the city of Saint Petersburg, submits a project application,

Zoe's own investigation must begin: when do legislative meetings for voting on and officiating policy, like receiving state funding and agreeing to its contractual obligations, convene? What do they call their departments down there, and which ones can appropriately receive the directed money? And then there are the codes. "Oh the codes," Zoe says, exasperated but also clearly enlivened. It's like the codes and their directories have finally presented a worthy opponent; she's Alexander the Great, if he were a CPA:

Z: "The codes...I don't know how much you know about the state, for instance. 'FLARE' is the state's financial checkbook...for the whole state. And not only do they have what's called the FLARE 29 digit account code,' within that they've got, like, 15 other little account codes and they all mean and direct to something different. Trying to keep up with that, I go to the book every time and go, 'Okay, so this is the OCA. That's the OPJ. Oh, okay, the funds are here. Okay. But the categories are there? Ugh. Oh wait a minute. This code matches with that code. Oh okay. I can't use that one or this one, I got to use the other one. Where's the pocket of money coming from? And you've gotta figure all of those pieces out. It's a lot of fun, hahaha."

E: "It's a real job creator."

Along with the codes, there are "time frames" which both the Resilient Coastlines Initiative and the cities planning assessments or adaptation abide closely to. Each contract for each chunk of funding stipulates a strict time frame within which the assessments or infrastructure projects must be completed. Once a city's grant is processed and the legislature meets to vote "yay" on signing a contract with the Resilient Coastlines Initiative, the municipality must then be able to reasonably prove they will spend the budget on a project

within an allotted time frame. Elizabeth tells me, “So yeah, it can take months from the time when you say to the city of Saint Petersburg, ‘We love your project, we're going to fund it,’ to the time when they actually can start [the project], where we have an executed contract and they can start the work: it can be three or four months. [And that’s in an] *uncomplicated* situation.” Zoe interjects to explain that the rhythm of local politics and the speed of government must be synced up with the contractually obligated time frames.

Z: “And that’s under circumstances [where we are assuming the city] is going to get all the time [allowed by the contract], the whole 18 months. We haven't *yet* got a contract that's going to be able to get all the time allocated [beginning] from the original [project start] date. Just to start [the project] because they can't start until [the contract] is fully executed on both sides. And then we have certain timeframes that things have to be completed by in order to pay them what we can pay them. And if it's not done, we can't pay. And then there's all the, well if you don't spend the money that gets routed back to this federal fund, and that federal fund says you can't use its [money] again [because you didn't use all of its money before in the timeframe].”

E: But the good thing about all this is eventually, and we're almost there, you get into a cycle where the same events are happening at the same time each year. So you can start to plan the hell a little bit more and be better prepared.

Z: So we're keeping three different chunks of granting, try to keep those straight at the same time. I got to a nice little chart on [a board in my office that just lays out the] timeframe. That's all [the chart], just the timeframe.

The vestiges of Governor Christ's climate adaptation leadership experts at the Department of Economic Opportunity worked with Elizabeth and helped her identify areas highly vulnerable to sea-level rise, in turn they used her comments alongside particular applicants to highlight those in more critical need of simply getting necessary peril of flood assessments. She's done the math. "I've gone so far as to calculate out how many communities haven't gotten [vulnerability assessments] done yet. At an average cost, [I asked] What would it cost us to help every single one that hasn't done it? \$6.4 million, for us to shoot \$40,000 [, or the average cost of a vulnerability assessment,] to every city or county that hasn't already gotten it finished." Elizabeth then said something telling about the mirroring of climate change predictions in money management. Getting the full \$6.4million from the state and federal budget is one challenge she explained. Yet, the greater challenge would be the work of churning all of these grants through the required accounting and contracts mechanisms. The two people staffing the Resilient Coastlines Initiative, as adept at their jobs as they are, would not have "the capacity to process the grants!" Even if they received all the money they asked for in their latest legislative budget request, "We can't do all of that in one year [the state budget decided annually] because we don't have the capacity to process the grants! Hahaha." "I wrote up [the budget request] and said, 'Well, we need \$6.4 million but we need it broken up into three or four or five years'".

During our last interview, Elizabeth wanted to make something very clear to me. Because we had been discussing the ins and outs of the Resilient Coastlines Initiative's tedious everyday functions, spending most of our time together defining in detail its purpose as a pecuniary regulator and a balancer of the state's checkbook, she wanted to make sure I understood the overall purpose of all this money management:

E: “But I think the thing that's important about this is that we're not just some granting agency giving out money. This is the state, and by default, what we are doing is telling local governments, this is how you go about resilience. This is how we shift policy. There's nobody at the FDEP right now that would say to you, this is our sea-level rise policy. This is our climate change policy. We haven't got that far. *But what we are doing is kind of defining what we feel the priorities are by how we give that funding out.*”
(emphasis added)

Here, Elizabeth explains that the Resilient Coastlines Initiative isn't just a state bank account where cities merely apply for withdrawals. Rather, the initiative represents the state (i.e. “this is the state”) and the state's interests. It's in charge of ranking the state's priorities when it comes to finding solutions for climate change, with limited grants symbolizing and bestowing state care distributed to only those projects deemed most in need. While other programs within the FDEP could not come out straightforwardly with their own climate change policies and resources for cities (i.e. “There's nobody at the FDEP right now that would say to you, this is our sea-level rise policy”), the Resilient Coastlines Initiatives at least had the unique ability to teach cities how to respond to climate change predictions indirectly, through implication, by giving grants to some cities (and denying others).

Analyzing the essence of the Resilient Coastlines Initiative's operations, we can see a discursive and material infrastructure of climate denial still at work. It is even strengthened in a way by its apparent ability to metabolize and assimilate certain vague aspects of climate science (i.e. encouraging vulnerability assessments without regulating the quality of those assessments or directing further action, and discussion of “resilience” lacking dialogue about mitigation) and, thereby, controlling what knowledge is made available and what cities *should* do about that

knowledge.²⁵⁵ The Resilient Coastlines Initiative—its application process, contract stipulations, and timeframes—is a material infrastructure that purposefully limits and constrains action around a limited pool of money. Further, it explicitly makes money the object of conservation, rather than the environment, as climate scientists working through the Council would have it. The result is a program designed, not to acknowledge and fully reckon with scientific knowledge (Chapter 1), but to *control* the impact of its spread and mitigate these prediction’s abilities to affect the state’s budget and its regulation of economic activity.

Elizabeth described how her initiative was bringing the phrase climate change back into Florida state government. In one of our first conversations she told me emphatically, “We can say climate change!” letting me know that no one in the government would stop her from referring to global warming or sea-level rise in explicit terms. She also told me a story to emphasize the contrast between how limited discourse once was during the gag order and how limitations on language have changed since the FDEP established the Resilient Coastlines Initiative. While speaking at a conference in Houston, TX on climate predictions and potential impacts to the city she exclaimed into the microphone, “Climate change! Climate change! Climate change! We can say ‘climate change’ in Florida.” She was trying to get a laugh and defuse some tension, pointing openly at the Scott administration’s recent and extremely public “gag order” snafu. No one laughed though. The audience shifted in their seats uncomfortably. Afterward, a group of city employees approached her to let her know they weren’t being a tough crowd, but that they

²⁵⁵ I want to state explicitly that any critique of the Initiative or the FDEP I present here addresses systemic or institutional problems I see within the state of Florida’s larger political-economic *modus operandi*. It would be a misreading to interpret my analysis of the interviews I’ve presented here as challenges to Elizabeth or Zoe’s work as individuals within this larger system. To the contrary, these women are leaders trudging through rocky soil — that of reform through paperwork, meetings, and micro-negotiations that most would find agonizing and mind-numbing. I personally admire them a great deal. The quality of their work and their moral standing is not in question here. What I would like to call into question is the structure of the Initiative itself and its context within the FDEP, the Florida state government, and our current political-economic system more generally.

themselves were still, unofficially, not allowed to say “climate change” in Houston, TX, a city that had at that point been destroyed by Hurricane Harvey’s floodwaters.

Elizabeth empathized with these city engineers. Before leading the Resilient Coastlines Initiative, she attended Community Resilience Meetings hosted by the Department of Economic Opportunity, one corner of the Florida state government where global warming adaptation efforts were renamed and resource deprived. She told me during our interview,

“When I first came on board I thought, okay, another part of [the Initiative's efforts] needs to be [enlivening that] focus group. Because those meetings when I was first involved...they were almost like support group meetings. Here would be this small group of people quietly, almost secretly working on climate change stuff in their own agencies. And [now] we [can] get together, pull the curtains, draw the blinds, you know, and, and talk about what everybody was doing and how we could work together. Okay, ‘We need to bring this back.’”

Bringing back the phrase “climate change” is a point of pride for Elizabeth. “We brought that back and grew it,” as she told me. Elizabeth was going to “pull the curtains” back and address climate change by name in meetings and conferences; she was going to combat an infrastructure of denial as well as she could with the power she was granted. Within her first year, she had traveled all around Florida as a representative of the state to talk to cities plainly about climate change. I watched her talk at two conference events, and her mission was clearly to try to rebuild the state relationships to its cities, many of which understand the impending climate impacts they will face and who want strong state and federal policy, funding, and resources to help them adapt

and mitigate. She at least hopes to change the discursive limits set by an infrastructure of denial—a mission that could eventually cost her job the next election cycle, she reminded me.

Yet, Zoe is the other side of the Resilient Coastlines Initiative. Zoe's position requires her to remind Elizabeth of their operation's limited scale; that even funding "adaptation and resilience" projects must be financially feasible and operable within the limits set out by contracts and timelines in order to be state sponsored. While Elizabeth travels across the peninsula and stands in front of podiums in conference halls to speak to legislators and concerned communities, Zoe, sits in her cubicle, her face alit by the glow of her desktop computer, while she reads over her meticulously developed funding application charts to manage money as if it were a natural resource in need of conservation. If a project is too ambitious or not "worth it," Zoe becomes the other deciding voice, rejecting that project. The question of, "Can we afford this?" and "What is financially reasonable?" allows Zoe to have the final say on whether these limited funds will be distributed, even if the proposal submitted is thoughtful and needed.

Conclusion

While the state is increasing its transparency through the Resilient Coastlines Initiative—slightly loosening its grip around climate change discourse and knowledge sharing and giving some money towards vulnerability assessments and some small adaptation projects—this transparency sets the terms and conditions around what information about climate change is acceptable (i.e. vulnerability assessments), how to talk about climate change (i.e. "resilience" and "adaptation"), and how the state can act based on this information (i.e. give small grants from a limited pool). The Resilient Coastlines Initiative creates ignorance, filtering knowledge, accepting and acting only on information that will allow the state to abide by an

ethic that presumes normalcy and protects the economy. “Flooding” will become a peril, so cities should get general assessments. “Adaptation” and “resilience” projects to guard against “flooding” will probably be necessary, but are not a priority if they are beyond the state’s allocated budget. Experts working on “adaptation” and “resilience” projects are allowed to share knowledge and experience, but without mentioning mitigation. The Resilient Coastlines Initiative allows the state to ignore the knowledge already established by researchers and experts working in local governments: that 1) Florida could have been leading the nation in emissions reduction efforts and ceding from contributing to its own demise, 2) given moderate (let alone extreme) sea-level rise predictions, much of the coastline will need to retreat in-land, and this will need to be funded and managed, and 3) real adaptation will require sustainable funding and cost billions of dollars over decades.

Governor Crist and his administration at the FDEP attempted to lay a foundation for an “infrastructure of belief,” or an institutional ecology that nurtured climate discourses and established roles for researchers and expert advisors. He put mitigation policy in place to regulate and eventually eliminate emissions.²⁵⁶ Programs, like the Council, were funded and encouraged to connect with policymakers and advise on how to prioritize those projects that would benefit human-environmental relations. Under Crist’s tenure, how the state of Florida should act was based on an open acceptance of established climate knowledge.

Conversely, Governor Scott’s administration created an infrastructure of denial that restricted action by creating ignorance. The FDEP upheld a gag order on phrases like “climate change,” editing documents that even connoted the existence of human induced global warming, the administration cut off relations with scientists who “served” him “science on a silver platter”

²⁵⁶ It should be said that Crist has flip-flopped on the issue of offshore drilling. He was, for a time, for oil extraction, but then switched his position while running against Scott in his second gubernatorial race.

as well as relations with cities whose expert engineers were looking for state leadership, and the administration slashed hundreds of millions of dollars from the state's budget, defunding programs like the Council. Rather than allowing available information to dictate priorities, information was restricted to prioritize budgeting and the principles of free market fundamentalism.

This case study presents two different ways a state could be captured by and then respond to climate change, or two different ways of knowing and building response to climate knowledge. Examining the state closely (i.e. "studying boring things") allows analysts to examine how seemingly neutral and rational systems, like government bureaucracy, establish and normalize what gets cared for, how that care is managed, and according to what priorities.

EPILOGUE

President Joe Biden signed an Executive Order into law within his first 100 days in office, titled “Tackling the Climate Crisis at Home and Abroad.” The order intends to put climate scientists’ findings at the center of domestic and foreign policy.²⁵⁷ The Biden Administration has also proposed a \$2 trillion infrastructure plan that earmarks hundreds of billions of dollars toward innovative climate adaptation (making electric grids more “resilient,” for instance) and emissions reduction. The administration hopes this infrastructure adaptation will help create 10 million clean energy jobs. The days of congressmen throwing snowballs across the Senate floor to “prove” the planet is too cold to be warming seems far away in light of these new policies. A recent news article in the prolific scientific journal *Nature* states that the nation is still clearly polarized, but that “scientists the world over are breathing a collective sigh of relief.”²⁵⁸ Analyzing the epistemic, ethical, social, and political forms emerging around trust in climate science is more relevant than ever.

Those working towards climate adaptation and mitigation may find some comfort in the new administration's efforts. However, as this dissertation demonstrates, the work of localizing predictions through scientific experimentation, building new histories to inform equitable futures, addressing the social and political conflicts that emerge alongside adaptation, and understanding the more insidious operations of infrastructures of denial continues after the “truce” of agreement.²⁵⁹ The media continuously reports on South Florida’s extreme vulnerability

²⁵⁷ The White House, “Executive Order on Tackling the Climate Crisis at Home and Abroad,” January 27th, 2021, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>.

²⁵⁸ Tollefson, “Scientists Relieved as Joe Biden Wins Tight US Presidential Election,” 183–84.

²⁵⁹ Edwards, “Knowledge Infrastructures Under Siege.”

to climate impacts. It has already become cliché to call Miami the canary in the proverbial coal mine of climate change. Yet, South Florida's status as an example of growing climate resilience governance remains a marginal story in our news cycles. Within the social sciences, the nuances of belief—the bodies of knowledge, policy, and social groups emerging around climate predictions—remain understudied.

This dissertation helps correct this gap in research to further our understanding of how people are responding to climate science's growing reach. In using the framework of *knowing and responding* I have sought to examine climate knowledge as a confluence of expert perspectives, histories, grassroots movements, and government (in)action. I argue throughout that knowledge and ethical response to climate change are built together, and that they emerge together dynamically and locally. Broadly, I show that climate predictions are more than a set of scientific conclusions: that they are made meaningful to South Florida's socio-environmental context and added to by different groups at the center of climate politics today. Each chapter of this dissertation provides an answer to my thesis's central inquiry: what more can we learn when we localize climate predictions in a specific place and begin analyzing the epistemic, ethical, and social forms belie the rhetoric of "belief and denial" of climate science? Each also offers original theoretical tools for examining how people are coming to produce knowledge about and respond to climate science.

Chapter 1 speaks directly to this dissertation's overall goal of understanding climate predictions as it emerges across a specific landscape through the diligent labor of caring scientists. It also attends to the more specific goal of analyzing the epistemic and social forms that sprout up around predictions' localization. Examining the ways scientists think and feel about the climate data they produce evidently opens for further exploration of the relationship

between knowledge creation and ethics. As my analysis demonstrates, scientists become subjects of climate knowledge as they are captured by their own conclusions and begin to change the way they think, feel, and act in relation to their data. This case study clearly shows that the process of knowledge-building in South Florida steers scientists into the “middle” and “fast lanes” of policy creation, or into a position where they promote faster action rather than only painstaking research.²⁶⁰

Disciplines, like paleoclimatology, demonstrate that the stories we create about the past curate the visions we build for our futures. As Paul Edwards extensively details, experts construct the global knowledge infrastructures which make global warming thinkable out of a long scientific memory, or large amounts of data patterns collected over long stretches of geologic and also human time. History is vital for envisioning our climate futures. In this vein, Chapter 2 analyzes original archival research to construct a different story of Miami’s socio-environmental history so we may see climate justice activists using this history as a tool for forecasting and critiquing the region’s climate changed future. The chapter’s detailed recasting of Miami’s nascency as the white supremacist “Magic City”—an example of what I call, the *envirotechnical sublime* at work—argues that localizing climate science requires reading predictions against South Florida’s socio-environmental histories as much as against its ecological and geological histories. I, along with climate justice activists, contend that Miami’s history of sequestering Black neighborhoods away from its beaches is a critical piece of South Florida’s contemporary body of climate knowledge and should inform the way the city chooses to adapt to predicted impacts. More broadly, this chapter advances the connection between science studies and environmental history by demonstrating how their theories and

²⁶⁰ Eyal, *The Crisis of Expertise*.

methodologies can be used together to study how climate knowledge is made meaningful in the landscape where it emerges.

I analyze “climate gentrification” in Chapter 3 as an epistemic object built by activists to subtend local climate science. I detail the concept's origins: how organizers combined Black environmental histories and scientific projections to predict how movement away from the shoreline following sea-level rise adaptation leads to the displacement of historically Black neighborhoods inland. The city of Miami has officially recognized climate gentrification as an essential framework for knowing and responding to climate predictions there. I combine insight from science studies analyses on the construction of expert legitimacy and agnotology to show that recognition, however, comes at a price. A public-private nexus of climate resilience has sprouted up to govern climate impacts and has appropriated climate gentrification, transforming its ethical critique of adaptation politics into a toothless ontological question: is it real or not? I use Charles Mills’ original intervention to show that this appropriation is demonstrative of “white ignorance” shadowing what could be a fuller body of climate knowledge. Over the arch of Chapters 2 and 3 I show that the struggle for Black environmental freedom in Miami began with civil rights leaders, like Garth Reeves, and that climate science has helped illuminate and emphasize the current state of this struggle. I further show that adaptation should not be defined as a technocratic reproduction of the status quo, but rather as a bottom-up informed assessment of socioeconomic conditions and environmental threats.

I end this dissertation with my final analytical contribution, which I call *infrastructures of denial*. I chose to study the state of Florida’s inverse response to climate science (i.e. its denial and erasure of climate science and climate scientists) as a way to unbox denial. I show that denial is not the passive rejection of knowledge but rather actively accomplishes things for people and

institutions; further, denial requires an infrastructure for its maintenance. Importantly, this chapter explains how transparency and rhetoric, like resilience discourse, allows the state to act as if it is adding new meaning to climate science and creating local response when instead it creates a facade behind which the state can continue to alienate scientists, keep funding adaptation efforts to a bare minimum, and control how climate change is talked about across its agencies.

As a whole, this dissertation demonstrates the ability of science studies' to offer insightful analyses for shifting policy and public perspectives from an uninformed belief that experts should simply parachute in and manage climate as any other crisis to conversations about our values and priorities as a society. When we look beyond the binary of belief and denial that undergirds bi-partisan politics in the United States, we can begin to ask critical questions about our plans for mitigation and adaptation. Additionally, we can access appropriate tools for disassembling irresponsible infrastructures that were built from incomplete or misinformed bodies of climate knowledge.

I imagine future work following two possible pathways. A comparison could be made between this Florida case study and other states that share the peninsula's significant vulnerability to climate impacts, such as California and Louisiana, but who are otherwise wholly different than the Floridian context. Research into places with differing socio-environmental landscapes, political allegiances, normative values, and socioeconomic histories could yield helpful insights into idiosyncrasies of climate response as they develop or, conversely, show larger patterns apparent across various sites. Such comparative research could be fruitful for understanding the mobility of the concepts I present here or developing analytics that can readily speak across contexts.

A closer look into South Florida's exponentially growing climate politics could also provide an avenue for understanding how knowledge and response is changing over time. It could give me the opportunity to flesh out the concept of an *infrastructure of belief* which I only use in passing throughout this thesis.

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