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Connecting Institutional Discourses and Everyday Understandings of Climate Change: Viewpoints from a Suburban Neighborhood in Tampa, Florida

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Connecting Institutional Discourses and Everyday Understandings of Climate Change:

Viewpoints from a Suburban Neighborhood in Tampa, Florida

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of
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DEDICATION

To Melissa

To Jacob & Jolie

To Ben & Carolyn

To all of my students

To all of the friends along the way

To the Challenge
ACKNOWLEDGMENTS

I acknowledge the process and all those who acted in its creation.

I acknowledge the creativity and hard work of all the authors pulled into this process.

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I acknowledge the support and feedback provided by my committee members.

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Despite a general consensus regarding anthropogenic global climate change across the international scientific community, many of the major greenhouse gas producers in the world, especially the United States, are hesitant to implement strict emissions regulations. According to some prominent atmospheric scientists, such as James Hansen and Michael Mann, if industrialized countries continue to produce carbon emissions at current rates, an irreversible planetary tipping point of raising temperatures 2°C above pre-industrial levels could be reached in less than 40 years. Societies have a wealth of information from the natural sciences to understand the climate problem and currently possess the technological means to address it. But substantial regulatory policies have not been implemented, clean energy technologies have not been established as the primary energy source, and widespread behavioral changes needed to create sustainable societies have not been fostered.

This dissertation seeks to understand why the preponderance of scientific evidence surrounding climate change has not produced a sea change of public perceptions of the climate change problem consistent with the dire projections of climate science. It is grounded in four interrelated questions: (1) What are the prevalent discourses of climate change and to which institutions can these be attached? (2) How do suburban residents understand climate change? (3) Since electricity is a
major link between suburban lifestyles and climate change, how does knowledge of climate change compare with knowledge of electricity production and consumption?

(4) In what ways do institutional discourses of climate change connect to the viewpoints of suburban consumers? These questions were explored through a case study carried out in a neighborhood in the city of Tampa, Florida. Forty-six semi-structured, face-to-face interviews were conducted to understand perceptions related to climate change, suburban consumption, and environmental conservation. The interviews compiled information pertaining to personal knowledge and representations of socio-ecological relationships.

The findings indicate that most relationships or connections to the natural world in general, and climate change in particular, are produced by the arrangements and processes of capital accumulation as experienced in everyday practices. Suburban residents seemed disconnected from or ignorant about how their everyday consumption is related to climate change. Based on ideological formations, as manifest in institutional discourses and material practices, suburban residents accept the social processes and spatial forms that they inhabit as being the only possible options for suburban living.
CHAPTER ONE:
INTRODUCTION

There are several reasons why global climate change can be considered a planetary event that has risen significant economic, environmental, and social questions. First, climate change exemplifies a generalized crisis of capitalist production, as unregulated industrial growth has ultimately rivaled and overwhelmed natural processes of atmospheric regulation. Even as advanced economies have sought to move into post-industrial futures, climate change is an insistent reminder that no part of the planet is unplugged from the consequences of environmental changes unleashed by fossil fuel-dependent economic growth. Second, the combination of human and natural processes in the construction of climate change breaks down conventionally accepted divisions of knowledge, so that climate change has required an engagement with socio-natures. Third, and possibly the most intriguing aspect of climate change, has been the debate it has unleashed about scientific authority. As climate change denialism remains a strong current in public opinion, especially in the U.S., climate change has become a site of conflict between economic and environmental interests and science has been both invoked and discounted in the process. Thus, material realities and discursive constructions of climate change seem to have diverged from one another.
This dissertation seeks to understand the production and consumption of knowledge about climate change by analyzing (i) dominant discourses of climate change and the institutions that are associated with them, and (ii) whether these dominant discourses are then re-produced in everyday contexts. By drawing on the perspectives of residents in Tampa, Florida, this study seeks to situate knowledge of climate change within the suburban contexts of consumption that are often implicated in the production of global climate change. In the process, this study seeks to examine whether dominant discourses of climate change as expressed by governmental, environmental, and media organizations are echoed within suburban contexts. Since the main electric company in Tampa uses coal as its source of energy, the extent to which residents here are concerned about climate change also becomes a useful way to understand possible disjunctures between knowledge of everyday consumption and broader knowledge of climate change.

**Planetary and Everyday Aspects of Climate Change**

Overwhelming evidence across many disciplines predicts dire consequences related to climate change, sketching a fearful future for the planet (IPCC, 2013). According to climate scientists, the socio-environmental landscapes of this century will look and feel very different from the previous two centuries. Based on current emission rates, an irreversible planetary tipping point (2°C above pre-industrial levels) could soon be reached (Hansen, 2013). Global surface temperatures, greenhouse gas emissions, ocean levels, hurricane intensities, crop failures, droughts, and many other
associated risks and vulnerabilities will most likely increase as levels of finite energy resources, water availability and quality, biodiversity, wetlands and forests decline (Mann and Kump, 2009). Even if global sea levels rise by only 6 feet (2 m) over the next century as predicted by climate models, drastic disruptions could be experienced in the major cities of the world (Kemp et al., 2011). Many of the world’s important economic centers are located in coastal zones making them extremely vulnerable to sea level rise, hurricanes, and associated storm surges. Changes in coastal conditions could also lead to major water systems becoming contaminated or exhausted, exposing city-dwellers to water-born microorganisms, carcinogens, as well as water shortages. As climate changes disrupt harvests and other land uses, already overpopulated cities could be inundated by mass migrations of starving and desperate “climate refugees.” In the process, the world’s cities and towns may become the most politically, economically, and militarily volatile places on Earth.

In 2009, the United States produced 6.576 billion metric tons of energy-related greenhouse gas emissions making it the second largest GHG producer in the world. These heat trapping emissions include: carbon dioxide, methane, nitrous oxide, and other high-global warming potential (high-GWP) gases—hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) (EIA, 2009). As consumption in the U.S., especially fossil fuel consumption, has become a matter of concern because of its contributions to climate change, the focus has usually been on rates of automobile usage. The extent to which coal-based electricity production is also responsible for greenhouse gas emissions remains less remarked upon. Currently, the U.S. produces
more electricity than any country in the world. Equally notable is the fact that nearly half (47%) of this electricity is produced through the combustion of coal—the largest driver of anthropogenic climate change (IPCC, 2013; IEA, 2012). In the U.S., 120 million buildings, homes, and offices are powered by the burning of fossil fuels, which produces 40% of the greenhouse gases released annually into the global atmosphere (EIA, 2010). The U.S. is the second largest producer of coal and the fourth largest exporter of coal. Per capita, however, U.S. consumers use the world’s largest share of coal, subsequently producing the largest amount of carbon dioxide emissions (16.9 tons per capita / year) (EIA, 2013). Despite the availability and declining cost of alternative energy systems (e.g., wind, solar, geothermal), widespread transitions to clean energy sources have been minimal (EIA, 2014). Low natural gas prices and the retirement of coal-fired power plants may slow the growth of coal production in the future, but it is projected that coal will remain the largest energy source for electricity generation in the U.S. – 35% in 2040 (EIA, 2013). The U.S. is also geographically located on the world’s largest proven reserves of coal, holding more than 22% of the world’s total known coal deposits (EIA, 2013), further suggesting the potential for long-term dependency.

While the U.S. remains a key site in enabling global policies for regulation of climate change, public opinion on climate change remains strongly divided between those who accept and those who deny the scientific basis of climate change studies. This is partly because the extent of public support for environmental action, necessary to implement policies to minimize negative impacts, is vulnerable to manipulation by
powerful actors. In light of the mismatch between knowledge of climate change and real action to mitigate climate change, insights on public perceptions of climate change gained from individual responses, beliefs, and values becomes a valuable avenue for research (Grothmann and Patt, 2005; O’Brien, 2011). Realizing that the causes of, problems associated with, and potential solutions for climate change, though well known, have not swayed an American public skeptical of climate science, scholars have turned to analyses of social and experiential influences on public perceptions of risk and adaptive behavior (Axsen and Kurani, 2012; Krosnick et al., 2006) as well as ideological foundations of individual perceptions (Zia and Todd, 2010).

Dispensing with rational actor logic, which assumes humans always make choices to maximize their personal advantage, many scholars contend that we must appreciate intersecting social, political, economic, psychological, and ideological frames of public understanding of climate change, actors attempting to influence knowledges, and the competing discourses these actors create, as well as which dimensions have the most influence in knowledge construction (Brulle et al., 2012; Dryzek, 2005; Fisher et al., 2013; Jasanoff, 2010; Spence et al., 2012). How environmental attitudes are formed or changed is a part of this broader consideration. Investigations, such as this study into public understandings of climate change, rest on the premise that policy decisions to combat climate change are more likely to be implemented when public opinion begins to align with climate science (Leiserowitz, 2006; Poortinga et al., 2011; Ruddell et al., 2012).
Cities become one useful site in which to understand how people are separated from knowledge of the causes and consequences of climate change in their everyday contexts. With per capita income growth and increased consumption of fossil fuels, intense ecological contradictions exist between the city and nature. These contradictions are well hidden by technological networks, spatial arrangements, and social and symbolic relations of commodification, which also contribute to reducing social and cultural tensions associated with production and consumption. Homes powered by electricity are sites of insatiable consumption, and spaces where natural resources come into contact with human societies and are transformed (Goodman et al., 2010). Yet, homes also insulate people from direct confrontations with the material ramifications of their consumption. A study of suburban contexts therefore becomes crucial to learning how knowledge and ignorance of climate change is linked to discursively produced distances between suburban homes and suburban natures.

**Research Questions**

The present study is framed by social constructivist approaches in an attempt to understand the development of public opinions of climate change. Overwhelming scientific evidence, which finds human activities to be the single largest driver of climate change, has not created a major sea change in public opinion in U.S., nor prompted legislators to enact strong regulatory measures to address the causes and consequences of climate change. This study was conducted to understand possible reasons for this situation, and investigates this apparent disconnect, disinterest, or
misunderstanding within the American public with regard to the impacts their daily consumptions have on the global natural and social environments.

The objectives of this dissertation are to examine how knowledges about coal and climate change are *constructed* by various state, business, scientific, and advocacy groups and how these knowledges are *reflected* in the perspectives of suburban consumers. The main research questions are as follows:

1. What are the prevalent discourses of climate change and to which institutions can these be attached?
2. How do suburban residents understand climate change?
3. Electricity being one major link between suburban lifestyles and climate change, how does knowledge of climate change compare with knowledge of electricity production and consumption?
4. In what ways do institutional discourses of climate change connect to the viewpoints of suburban consumers?

**Contributions of the Study**

This study seeks to empirically contribute to climate change studies in two ways. First, by seeking to understand how opinions about climate change are constructed, this study spans the distance between the realities of climate change and the realities of everyday consumers. In the process, it can work towards understanding the extent to which the polarized debate on climate change at the national level is reproduced as polarized perspectives on climate change at the level of suburban neighborhoods. Second, this study focuses on the city of Tampa, Florida, a region particularly
susceptible to economic and ecological disruptions due to climate change. Tampa, like many major suburban centers around the world, is a coastal city making it vulnerable to sea-level rise, storm surges, and hurricanes. The National Climate Assessment (NCA) finds that “large numbers of southeastern cities, roads, railways, ports, airports, oil and gas facilities, and water supplies are vulnerable to the impacts of sea level rise” (Melillo et al., 2014). The extent to which local attitudes towards and knowledge of climate change interacts with direct impacts of climate change can this be studied here.

**Organization of Chapters**

The theoretical and methodological foundations of this study are examined in Chapters 2 and 3. Chapter 2 outlines Neil Smith’s “production of nature” thesis to understand climate change as a social and natural problem produced in capitalist societies which must transform nature in accordance with the logic of the profit motive. As long as profits are realized by transforming coal and other fossil fuels into electricity, capitalist societies will continue to exacerbate the warming of the planet. U.S. suburbs become a useful context in which to examine contradictions existing between living high-carbon lifestyles and seeking to maintain environmental quality. Chapter 3 borrow from the field of environmental psychology to understand how perceptions at the individual level are constructed through various sources of information, from everyday experiences to media discourses. In the process, it outlines studies of climate change and environmental perception that inform the thematic analysis of interviews conducted as part of this study.
Chapters 4, 5 and 6 discuss the methods and findings of this study. In Chapter 4, an overview of the study area is presented along with an outline of this study’s data collection methods. Chapter 5 presents the results and discussion from an analysis of texts that cover the range of institutions associated with producing and regulating climate change: governmental agencies, political parties, think tanks, environmental groups, and energy companies. This chapter seeks to outline the main positions in the climate change debate which can then provide a basis for comparison with the perspectives of interview respondents. Chapter 6 provides a synthesis and discussion of 46 participant interviews. This chapter shifts the discussion of climate change to the realm of the everyday and discusses findings from interviews conducted with residents of the neighborhood of Tampa Palms. The chapter focuses on questions specific to climate change, knowledge of electricity production, and broader environmental attitudes. The chapter thus situates knowledge of climate change within a wider set of environmental knowledge, attitudes, and concerns. Overall, this dissertation attempts to understand climate change as it is articulated in everyday contexts in order to trace how polarized debates at the institutional level are echoed within neighborhood settings.
CHAPTER TWO:
THEORETICAL FRAMEWORKS: PRODUCING SUBURBAN NATURES

This chapter discusses the theories of nature-society relations that undergird the subsequent analyses of climate change. The main aim of this chapter is to reveal and question the ways in which human and non-human natures have been separated, such that everyday connections to global climate change have remained obscured. Thus, even as suburban consumption is centrally enmeshed in greenhouse gas emissions, which propel climate change, suburban homes serve to insulate residents from the any direct knowledge of their role in the production of such emissions (Cronon, 1996). The home can therefore be considered an ideological construction that hides access to environmental knowledge. The chapter begins by examining the notion of the ‘production of nature’ and links this to the production of an ideological approach to the environment, which is exemplified by the attachment to suburban lifestyles.

Production of Nature and Consciousness

The “production of nature” thesis, as proposed by geographer Neil Smith (1984), is an important theoretical-methodological device for comprehending the production of climate change. Smith distinguishes between ‘first’ and ‘second’ natures, the latter being by-products of human interactions with ‘first nature’. For instance, in the case of
electricity production, raw materials such as coal, oil, and natural gas are removed from the environment, exploited in the process of electricity production, and then the useless and valueless remnants (e.g. greenhouse gases, coal ash) are released back into the global environment. The production of nature thesis allows us to trace the causal associations of consumption back to the original producers of nature, but more importantly is an entry point for analysis of the fundamental power relations between those producing nature and those consuming partial, altered forms of nature. This consumption of commodified forms of nature invariably entails the rearrangement of ideologies of nature.

Castree and Braun (2001, p. 9) advance some basic questions about the ‘production of nature:’ “what forces are driving this production? what effects are new productions of nature likely to have? and is it right, morally and politically, for human to reconstruct nature at the deepest level for their own purposes?” A capitalist economy, constructed on the profit-motive and seeking unfettered access to accumulation, shapes the production of contemporary nature, but its effects and its moral implications remain matters of debate. Climate change is one example of how the manifestations of the production of nature themselves become sites of contestation.

Smith argues that understanding the production of nature, or the continuous transformation of the non-human world into commodities for exchange under capitalism, serves to suture humans and nature back together since it links human beings to the material bases of their existence. Yet, the production of nature thesis also serves to subsume a large part of nature within the realm of human productions, so the
nature-society separation is both maintained and challenged. However, Smith moves quickly from the production of nature thesis to the ‘production of consciousness,’ arguing that as we re-create the natural world we are in the process re-creating ourselves, ad infinitum. Capitalism has historically sought to eliminate barriers (social or biological) to accumulation. Therefore, mental constructions that create connectedness and empathy for nature are an important barrier to overcome in order to continue a mode of production based on the exploitation of natural and human capital.

For Smith, the rise of the bourgeois class entails the rise of bourgeois consciousness. “Rise” can be interpreted as the continuous spread of the production processes of capitalism across the globe, albeit unevenly, but continuously “stalking the planet in search of profit.” As this new consciousness spreads, a process of inversion occurs. Žižek (1989, p. 50) writes, “An ideology really succeeds when even the facts which at first sight contradict it start to function as arguments in its favor.” According to the principles of “bourgeois ideology,” as Smith describes the mental transformation of human beings, nature and society are divided materially and mentally; ontologically separate. In order to expose the truths and motivations of capitalist development, this dualistic mentality has to be collapsed.

The problem is that nature appears to us in our everyday life as a separate entity. To pre-modern societies, nature presented itself in mysterious and fearful forms such as thunderstorms, terrifying beasts, and virulent diseases affecting their crops and their bodies. Smith points out the contradiction between emancipating ourselves from the fears of nature through the scientific advances of the Enlightenment, and
simultaneously enslaving ourselves within the bourgeois doctrine. As capitalism expanded, the level of alienation, from our own labor, fellow laborers, the natural world, and ourselves, has reached the point of universalization. To oppose this, as Horkheimer and Adorno (2002, p.29) argue, “The instruments of power—language, weapons, and finally machines—which are intended to hold everyone in their grasp, must in turn be grasped by everyone.”

In the newly produced socio-ecological landscapes, it becomes, in part by design, nearly impossible to be clear about what exactly counts as ‘first’, ‘second’, or ‘third’ nature. For example, according to “bourgeois doctrine,” competition is deemed natural, a fundamental, undeniable, universal, and therefore unchangeable, behavioral structure of all organisms on the planet. Of course, elites do not necessarily need to ‘believe’ in Darwinism to employ Social Darwinism to legitimize their positions of power. Apologists for capitalism represent hierarchical structures and competition as ‘natural’ due to the fact that plants and animals compete for territory and resources in the wild. Consequently, everyday life (human nature) in a capitalist society appears to follow the laws of nature casting capitalism as fundamental, undeniable, universal, and ultimately an unchangeable and unstoppable artifact of human social evolution. But if human nature has been produced (altered) by capital how can we be sure about what is universal, what is our true human nature?

Magdoff (2010) flatly rejects the notion that capitalism is a social extension of innate human qualities:
Traits fostered by capitalism are commonly viewed as being innate to “human nature,” thus making a society organized around goals other than the profit motive unthinkable. But humans are clearly capable of embracing a wide range of characteristics, extending from great cruelty to great sacrifice for a cause, to true altruism. The “killer instinct” we supposedly inherited from evolutionary ancestors – the evidence being chimpanzees killing the babies of other chimps – is being questioned by reference to the peaceful characteristics of other hominids such as gorillas and bonobos (as closely related to humans as chimpanzees). Studies of human babies have also shown that, though selfishness is a human trait, so are cooperation, empathy, altruism, and helpfulness. Wisdom teaches us, as Einstein emphasized, that human beings are both solitary and social beings. To emphasize the former at the expense of the latter is to invite destruction (2010, p. 11).

What may be the most frightening aspect for anyone critical of capitalism is the incredible power of capital to colonize the ‘natural’ landscapes within the human mind. Once this occurs, and the process of inversion begins to grasp the collective, capital’s apologists no longer need to produce propaganda or “manufacture consent” for the legitimation of the ruling class. As each mind is captured, new apologists breed again and again and the virulent strain of the dominant mode production is free to exploit the masses and the natural world unrestrained. The frightening circumstance that becomes apparent is that as nature is produced to feed capital’s insatiable cravings for profit,
conceptual constructions are produced and re-produced in terms attuned with capital, and all socio-environmental perimeters of the physical world become interdependent with the production process. However, one of the main problems with such an argument is that it suggests that the cessation of capitalism would destroy existing human social order since it is completely dependent on it. The extent to which this is a politically problematic position thus warrants consideration.

In the afterword to the third edition of Uneven Development (1984), Smith applies his thesis of the ‘production of nature’ to the politics of climate change. He argues that an exclusive focus on the apocalyptic dangers of global warming will not strengthen any environmental movement that seriously wants to reduce fossil fuel emissions. For Smith, negative visions of future climatic events move the focus away from the real causes of global warming; thus no substantial progress will be made in the halls of power if the consequences or end-products of the problem mask the social problem of capital accumulation. In Smith’s view, the apocalypticism of progressive politics only finds solutions in broad-based voluntarism, simultaneously placing the blame and burden of the dire consequences of climate change onto the high-carbon lifestyles of all consumers. This implies that we live in a social structure full of simple choices and if we only augment our lifestyles to include green energy sources and low-carbon products the symptoms of our heavy carbon footprints will go away. However, the idea of choice is an illusion: “Most of us do not have a choice but to consume some modicum of hydrocarbon fuel for travel, heating, cooling, electricity, and so forth—not because we choose to but because the alternatives are prohibitively expensive or simply impossible.
The lack of alternatives is anything but voluntaristic, driven instead by calculations of competitive profitability” (Smith, 1984, p. 246).

Why haven’t millions of environmentally conscious consumers simply added solar panels to their roofs to create clean, renewable energy independent of the power companies? With most Americans living off credit cards with little to no disposable income, it’s not hard to imagine why everyone doesn’t purchase $30,000 solar panels for a home that could very easily be a payment or two away from foreclosure. Are there other options? Leasing solar panels perhaps? We must also consider that the process of suburbanization has created perverse environmental needs, such as the need for private automobiles, one for every American. Until recently, except for a short time in the 1990s in California, no electric vehicles were manufactured by American car companies or imported by foreign manufacturers (Brown, 2001). Fossil fuel consumption refutes one of the major tenets of free-market capitalism, which states that competition provides consumers with choices. Smith (1984, p. 52) concludes his discussion of the ‘production of nature’ with the notion of fetishism. Commodities, whether homes or automobiles, conceal the social and environmental relations of their production.

As Castree and Braun (2001) point out, there are a number of problems with the ‘production of nature’ thesis. For instance, due to the Marxist foundations of the thesis, the approach is criticized for promoting Prometheanism and for being masculinist. The approach is viewed as another formulation regarding nature as something to be subdued, by men, in the production process, whether that process is capitalist or socialist. Further, the concept is criticized for placing more emphasis on the production
process than the agency of nature. The missing question therefore is: how does nature, either the so-called pristine ‘first nature’ or man-made ‘second nature’ effect the functioning of capital? An overly anthropocentric, lopsided view of the capital—nature dialectic is thus promoted by the concept. Smith concedes this point, but argues that the ‘production of nature’ thesis can be *anthropomorphic* without being fully technocratic or anthropocentric. According to Smith (1996, p. 50), “the notion of ‘production of nature’ has the political advantage in that it focuses the politics of nature around the question of how, and to what ends, alternative natures might be produced.” The ‘production of nature’ and the associated ‘production of consciousness’ are useful theoretical constructs to keep in mind as climate change and the suburban contexts with which it is connected are considered.

**Connecting Suburban Homes to Climate Change**

Carbon-intensive processes that characterize suburbanized regions across the globe are the most significant contributors of greenhouse gases (GHG) — water vapor, carbon dioxide, methane, nitrous oxide, *ozone*, chlorofluorocarbons (CFCs) — to the global atmosphere (Kennedy et al., 2010). These molecules absorb solar energy or heat radiated from the surface of the Earth. As the concentration of greenhouse gases increases (up from 280ppm to 400ppm since 1750), the globe heats up as more radiant energy is reflected from the Earth than is received from the sun. The ‘urban question,’ which draws attention to processes of suburban growth and the forms of social and environmental inequalities thus engendered, has become the most important question
in which to conceptualize the causes of and solutions to the damaging effects of global environmental change due to the concentration of populations in urban regions and the continuing growth of urban consumption. While a city such as Tampa may seem a minor player in comparison to the global cities in terms of emissions, the dependence of the city on coal for electricity production, as well as proliferation of privatized automobile use and suburban sprawl, make it a useful context in which to understand the suburban morphologies and ecologies which enable unfettered resource utilization.

In many ways, cities do not serve to connect nature and society, thus linking social processes to their material conditions, but exemplify contradictions between carbon-intensive lifestyles and the natural environment. As capitalist societies push past global ecological boundaries (Rockström et al., 2009), scholars have begun to fuse critiques of capitalism with an understanding of and sensitivity to the complex processes of nonhuman ecosystems (Davis, 1998; Harvey, 1996; Peet, 2004; Robbins, 2011). Changes to ecosystems or changing relationships between people and natural resources are recognized as reflections of power relations. Within the interdisciplinary study of suburban political ecology, nature-society dualisms have been questioned to understand how social inequalities shape environmental processes (Gandy, 2004; Graham & Marvin, 2001; Heynen, 2006; Kaika, 2004; Robbins & Sharp, 2003; Robbins, 2007; Swyngedouw, 2004). In light of growing evidence of climate change and the view that suburban environments are important sites of consumption (Marzluff, 2008), recent theoretical and empirical studies have examined “the social, spatial, and ecological relationships embedded in suburban industrial capitalism” (Huber, 2010, p. 75).
Suburban political ecologists are thus increasingly seeking to merge industrial ecology with critical suburban studies (Liverman, Yarnal, and Turner, 2000).

For urban political ecologists, suburban settlements are regarded through the lens of political economy (Kaika and Swyngedouw, 2000; Swyngedouw and Heynen, 2003; Swyngedouw, Kaika, and Castro, 2002), but also as ecological regions of consumption and waste production dependent on its attachment to global sources of matter and energy (Keil, 2005). Within suburban regions, environmental processes are controlled and manipulated by the “interests of the elite at the expense of marginalized populations” (Swyngedouw & Heynen, 2003, p. 902). Ecological problems, such as climate change, are then understood as problems integral to political economy and not external from it. Therefore, to appreciate a more complete picture of cities and the problems (and solutions) they pose, researchers take a multidisciplinary approach by incorporating all aspects of the city: power relations, structural components, spatial organization, cultural meanings, and ecological analysis.

The disconnection between homes and the natural resources on which they depend constitutes one of the main ways in which suburban residents remain unaware of the environmental consequences of their everyday lives. A focus on infrastructural networks enables a reevaluation of suburban life and a pathway to connect suburban consumption to industrial production (Braun and Castree, 1998). Contemporary industrial ecologists, civil and mechanical engineers, and urban planners often use the metaphor of “metabolism” to evaluate environmental processes within cities and relationships between cities and their surroundings (Alberti, 1999; Eaton, Hammond, &
Laurie, 2007; Newman, 1999). Metabolisms are regarded as socionatural processes controlled and transformed in the accumulation process, so that metabolism couples insights from natural sciences with the capitalist mode of production. Current studies in suburban political ecology focus on ecological inputs and outputs of a city with the understanding that the processes and changes of the city are tied to the political, economic, and cultural components of society. Therefore, metabolism is a term used in explanations of both social and natural processes and the suburban as a dialectical “process of socioecological change” (Swyngedouw and Heynen, 2003, p. 899). As high consumption levels in cities make demands on near and distant resources, an imbalance is created within and between ecosystems and cities. In the process, a “metabolic rift” is constructed as ecosystems can no longer provide the amounts of energy and materials needed by cities or absorb waste products from cities. Faced with this “rift,” planners and engineers often seek solutions in new technologies (Makrides et al., 2010) and city redesign (Milner, Davies, & Wilkinson, 2012) by moving to low-carbon energy inputs, such as geothermal, solar, and wind technologies, or high efficiency “green buildings” and redesigning infrastructural systems for transport and waste management (Kennedy, Pincetl, and Bunje, 2011).

The question that arises in turn is why the metabolic rift remains, for the most part, invisible. Kaika and Swyngedouw (2000) refer to this invisibility and cognitive elusiveness of high-tech spatial arrangements as “the phantasmagoria of suburban technological networks.” For instance, the advent of power lines bringing electricity into private homes revolutionized individual worlds, increasing levels of comfort and
stability while transforming the home itself into a fetishized domain for the accumulation of capital. Flows, such as electrons circulating through buildings and homes, become “permanent” through their ubiquitous existence and interdependence with the structure or “isolable domain” of the home. This “permanence” of the seemingly static and invisible phenomenon of electricity production and consumption act to hide the contradictory flows between the environment and the home.

The home should also be considered an extension of the workplace, as fixed capital. Laborers must pay a portion of their income in the form of mortgage payments or rents back to the bank or landlord. The home becomes both a commodity and a place of consumption, a place required for laborers to recoup mentally and physically, and a place for reproducing both laborers and relations between capital and labor. In the process, the home becomes an essential requirement for social identity production and reproduction, forming an all-encompassing framework for daily life and one that hides the flows that render the home a part of the whole of capitalism.

The materiality of the home therefore becomes the basis for an ideological conception; ideological in the sense that the exact processes of accumulation, power relations, and metabolic connections to nature are hidden. Through the home, capitalism is not required to be “permanently revolutionary.” Advertisements may sell consumers on changing the way in which electricity is generated, but the idea of electricity as part of the household remains. The home is the place where new, revolutionary products are consumed, but the home remains juxtaposed to spaces of work as a realm devoid of revolutionary qualities. Through a naturalization and
routinization of certain forms of consumption, whether electricity at the flick of a switch or water at the turn of a tap, the power relations and environmental contradictions that characterize the home are consistently masked.

Linked to the home, is the ideological notion of the American Dream or “the American way of life” (Huber, 2013). This is more about what is missing that what is apparent or what is dreamed. The fantasy of the home evacuates all the other things and people, including those that inhabit the home itself, who must suffer to produce and maintain the dream. In the process, the desire for a home becomes a form of self-regulation and self-repression. As Eagleton (1991, p. 37) notes, “it is routine material logic of everyday life, not some body or doctrine which keeps the system ticking on.”

Suburban lifestyles, in the form in which they exist in advanced economies, must be imagined as the final utopia. Remolding of personal, possibly different, utopian visions of life into the folds of capitalist life is required for stability. Visions of newer and better suburban arrangements, such as “sustainable” green neighborhoods, are then negatively represented as most utopian visions are: unachievable, unrealistic, untenable, costly or even potentially undesirable. As long as people’s hopes are adapted to the current mode of living within the confines of the current regime of accumulation, a semblance of normalcy can be maintained without the tensions of facing up to the environmental costs of everyday consumption.

In their article, “Is another city possible?” Vallance and Perkins (2010) find any physical changes to the suburban environment to achieve sustainability of a city futile, and possibly counterproductive, if the views, rights, and needs of a city’s inhabitants
are not considered. They contend that “the suburban be regarded as a condition” over
and above attempts to change the built form (p. 450). If citizens feel they are being
inconvenienced or made to sacrifice or constrain resource consumption and
development within the city, sustainability efforts could backfire and cause an
increasing number of city dwellers to move out to low-density exurbs. The authors refer
to emigration of this type, facilitated by impositions, as “regressive outcomes” wherein
the wealthy insulate themselves from regulations on the outskirts of the city. In this
regard, compact cities and smart growth methodologies, which focus on energy and
pollution reduction though highly efficient construction materials, are considered
impediments to sustainability.

Therefore, if we want a city to be sustainable, emphasis must be placed on the
“condition” of the inhabitants. By this rationale, if citizens feel secure, included, and
trustful of one another and of the state, a sustainable social atmosphere “may yield far
greater benefits than tinkering with suburban form” (p. 452). To combat the persistent
“anti-suburban, pro-nature dichotomy,” the authors propose citizens be re-connected to
their own consumption, links which have been dissolved by the ex-suburban placement
of water treatment plants, coal-fired power plants, jails, mines, and slaughterhouses.
Therefore, the solution to unsustainable cities, which house over half of the world’s
population, will be found when “relationships between parts” are recognized (p. 450).
To achieve sustainability, “tinkering” with structures in isolation from the social
dynamics in suburban spaces may not be the most reasonable solution to resource
depletion and climate change.
The suburban home thus becomes a useful site in which to understand how ideological constructions are materialized and utilized to quell environmental anxieties. Yet, political tensions around the environment continue to be articulated at national and international scales. The continuation of ideological productions in other realms needs to be considered, especially in terms of how desires to address the rift between the nature of homes, and non-human natures beyond homes, emerge and are quelled.
Climate change (or “global warming”) is a highly complex, ‘natural’ phenomenon occurring at both local and global scales and across long expanses of time, which must be represented by a field of experts (e.g. IPCC) to the public via mass media. According to the realist perspective of these experts, the ecological phenomenon itself is a material and quantifiable entity with many associated environmental and social effects. However, climate change is not a process that can necessarily be experienced directly either in terms of its production or outcomes; as a global phenomenon it is produced from vast, indeterminate sources in every corner of the world. Even if people live through the devastating effects of a large hurricane or prolonged drought, the cause of these events cannot be directly experienced or precisely determined.

Publics must rely on what Castree (2014) refers to as the “epistemic community”—scientific experts, educators, textbooks, politicians, advocacy groups, pundits, and others that attempt to explain ‘nature’—in order to understand the bigger picture and to make connections from the many ecological side-effects directly experienced to the global climate change problem. Even though human beings have mastered the natural world to a large degree, our experiential knowledge is very
limited. Thus, most of us must rely on the epistemic community in order to contextualize our interpretations of environmental processes within the complex, industrial societies.

Diverse political and economic power structures, cultural dogmas, lay knowledges, individual attitudes, and daily practices concurrently produce carbon emissions as well as discourses of climate change. As British climate scientist Hulme (2009) explains, climate change is as much a physical phenomenon as it is a social construction; for the most part, climate change is knowable to us only through various cultural representations. He has proposed that climate change be viewed as an “idea that now travels well beyond its origins in the natural sciences” (p. xxvi). The “idea of climate change,” as proposed by Hulme, fuses local dimensions of the climate problem with global consequences, knowledges with power relations, and environmental perceptions with environmental behaviors. In this manner, climate change can be approached dialectically through an “understanding of processes, flows, fluxes, and relations over the analysis of elements, things, structures, and organized systems” (Harvey, 1996, p. 49). To understand potential solutions to the “climate problem,” social scientists must appreciate the myriad of sociological frames that may help identify the many ways knowledges of climate change are constructed as well as find appropriate individual and governmental responses.

This chapter considers climate change from the perspective of environmental psychology in order to build a framework for understanding how popular perceptions of scientific discourses are constructed. Climate change can be considered a site of
struggle where climate activists engage with climate skeptics. Public perceptions of climate change are shaped by this struggle, one that encompasses the environmental movement, conservative and liberal political groups, and the news media. Scientific discourses percolate to the public through these various channels, and how this translation of science to public opinion takes place is one of the key issues seeking to be addressed by social studies of climate change.

The Idea of Climate Change: Tracing the History

Analogous to the “idea of nature” explored by ecophilosophers (Oelschlaeger, 1991) and environmental historians (Cronon, 1983; Nash, 1973), Hulme (2009) has examined the “idea of climate change” particular to various thinkers throughout history from the Greeks to modern climate scientists, including those contributing to current IPCC climate reports. Ideology, for Hulme, is defined as “the body of doctrine, myth, belief, etc., that guides an individual, social movement, institution, class, or large group. Marxism and racism are obvious examples of ideologies; science and religion more controversially so” (Hulme, 2009, p. 18). Ideological notions are the core dogmas of individuals projected onto natural phenomena and then used to construct scientific knowledges. Ideological scientism of this type generally lacks clear empirical data to back often-nefarious claims.

The Greeks used climatic knowledge to solidify their vision of their place in the world. As a superior culture, this knowledge both justified the hierarchical arrangements of their own society, especially slavery, as well as the inferiority of
cultures outside of the Mediterranean zone. Philosophers and scientists have also employed differences in climate and sometimes gradual or rapid changes in climate over time in different regions as “a way of simultaneously explaining and justifying … the hegemony of the Earth (or climate) scientist” (Hulme, 2009, p. 18).

American geographer Huntington used climate by as an explanation of, and justification for, the social inequalities that characterized the world. For him, inferior climates produced inferior human races. In Civilization and Climate, Huntington (1915) attributed the wide variety of human races observed and the degree of their cultural development to be inextricably linked to the climate of each region. Comparing varieties of trees and the success of their fruit to human races he wrote,

[Climate’s] combined direct and indirect effects in the past has been a strong factor—some would say, the strongest—in causing migration, racial mixture, and natural selection; and it may have had something to do with producing the variations which the biologists call mutations. Thus it has had a powerful effect upon inheritance. (p. 29)

This understanding of climate, as able to influence human society, has been challenged by processes of climate change. Turning the tables on nature, industrial societies now control the global atmosphere and ensuing environmental change. In this sense, humans control and dominate nature through, for instance, the use of fossil fuels and modern atmospheric geo-engineering (Goodell, 2010). Climate thus becomes an aspect of nature that has to be controlled to enable innovation and maximize human comfort. On the scale of the suburban, both private and public spaces are controlled in
terms of temperature, such control also enabling insects, pollen, mold, and smog, among other forms of non-human and human nature, to be shut out. An example of large-scale climatic control was provided by China which attempted to “seed clouds with silver iodine and dry ice” to prevent the appearance of smog and pollution in Beijing in television broadcast to the world during the 2008 Olympics (Willyard, 2008).

The environmental movement of 1960s, which pushed for national regulatory policies such as the Clean Air Act in 1970, constructed a new conceptual and political framework for interpreting atmospheric pollution. For instance, Rachael Carson’s *Silent Spring* changed the public dialog by demonstrating that industrial chemicals arbitrarily released into the atmosphere can have devastating health and ecological effects. Therefore, human actions with regard to the environment could not be considered benign in all cases. As a political agenda, this divided those that contaminated the environment (exploiters) from those that wanted to regulate or control the effects of this pollution (conservationists). In terms of political allegiance and voting practices, the public has been divided into those that support environmental exploitation and those that support environmental conservation. For those people who are both environmentally conscious and who support neoconservative ‘free-market’ policies, some amount of tension is bound to occur. The question that arises therefore is how this tension is negotiated through institutional and everyday practices.

Environmentalists tend to construct their own ontological duality. Environmental activists, especially deep ecologists, have idealized the climate as something that must be ‘stabilized’ and protected from the damaging effects of coal-
fired power plants. For example, environmental activist Bill McKibben, heads a group called 350.org. “350” representing 350 parts per million (ppm), the maximum carbon dioxide level that the planet can sustainably manage without crossing climatic and other ecological “tipping points.” Hulme (2009) argues that this type of ecophilosophy is ideological because nature and society are divided ontologically. As divided categories, it is assumed that the natural world is an independent and ultimately “external” entity hence unable to be either affected or fixed by society.

Ecological philosopher, Max Oelschlaeger, theorizes that from the Renaissance to the present day, all materials, energy, and spaces of nature have been conceptualized as components of utility, needed only for economic progression. Oelschlaeger (1991) writes,

Modernism … effected an ideological conversion of the wilderness into material nature, both as an object of scientific inquiry and as a means to fuel economic progress … Unlike Paleolithic and Neolithic people, and unlike even the Greeks and early Christians, modern human beings think of themselves as existing without limits. And nature, a mythless nature conceived of as nothing more than matter in motion, is thought to be infinitely plastic (p. 69).

Paradoxically, the materials which provide most of the potential energy powering the engine of capitalism (e.g. wood, coal, oil), building and powering cities and homes and transporting people and things around the world, are perceived as dead debris, left in the ground for millions of years until the capitalist imaginary of ‘accumulation for
accumulation’s sake’ took hold. This is why these components of wilderness are ideological, as Oelschlaeger puts it. As remnants of past nature, the modern representation of them is exclusively utilitarian, therefore ideological, effectually turning these materials into ‘wilderness’ devoid of origin, time, or agency (expect potential energy to be burned). As all philosophical and aesthetic moorings have been removed from the natural world, the mystery is gone and only the useful pieces are assembled, the rest are pushed aside physically and mentally.

In the process, money has become the dominant mode of measurement, both in terms of the market and in cultural consciousness that determines value, especially the value of the components of nature (Harvey, 1996). In many cases, objects that cannot be commodified and sold in the marketplace are socially constructed as useless, especially if they are not considered aesthetically appealing or part of the national identity. Industrial societies control and dominate nature without limits as the public is pacified by a technological dogma which holds that damages inflicted by present scientific advancements can be cured by future scientific advancements. Thus, if coal, oil, and natural gas reserves are consumed to depletion, solar panels and wind turbines can be constructed without any need for changing the profit imperative of capitalism.

Climate scientists have directed attention to long-term trends of climatic stability with some analyses going as far back as 55 million years to demonstrate that the current state of climate is an aberration, which cannot be explained by natural radiative forcings such as volcanic eruptions. Focusing on near-past (1750-2011), near-present (2002-2011), and future (2081–2100) time frames, distortional and rapid effects of anthropogenic
radiative forcings from the burning of fossil fuels since the start of the Industrial Revolution can be demonstrated. Some experts assert that if one trillion tons of carbon dioxide were spewed into the atmosphere (predicted to occur in 2040), then average global surface temperatures will exceed 2°C above pre-industrial levels (Allen et al., 2009). Past trends help climate scientists make credible and somewhat reliable predictions of future climatic warming that will accompany the current exponential growth rates of fossil fuel consumption.

As with any predictions of the future, dire forecasts of global atmospheric disturbance have varying degrees of uncertainty. This does not mean that these changes will not occur, but that climate science cannot make solid predictions of exactly when potential dangerous effects will occur. For instance, many climatologists fear methane hydrates frozen in lake beds and on the sea floor could release inordinate amounts of methane, which traps around 25 times more radiative energy as carbon dioxide, setting off a chain reaction of positive feedbacks rapidly heating the planet (Hansen et al., 2008). Publics can interpret these findings in a number of ways. Overly pessimistic claims could frame scientists as radical doomsayers, while uncertain or overly cautious predictions can feed complacency and political inaction. If substantial changes in climate do not occur for hundreds or thousands of years, risk assessments could be viewed as irrelevant. As scientists and environmentalists continue to insist on the value and urgency of focusing on controlling climate change and its effects, the question that arises is why such pronouncements do not filter into the public consciousness.
Explaining Why Climate Change Remains Dissociated from Public Consciousness: From Natural Science to Environmental Psychology

The current era is being called the Anthropocene to indicate that humanity’s impact on the planet in the last 150 years has no equivalent in the entire history or pre-history of the human species (Crutzen & Steffen, 2003). The present-day social structure has created a dependence on fossil fuels, which has become symbolic of national progress. This is especially true of the consumption habits of developed nations, the most likely cause of the exponential increase in atmospheric carbon dioxide and other greenhouse gases, especially in the last 50 years (Shwom and Lorenzen, 2012). For instance, one American citizen consumes 25 times more resources than an average citizen from India, China, Mexico, or other underdeveloped nations.

The Kyoto Protocol made this connection over twenty years ago, stating that industrialized nations were directly responsible for 77% of the global warming emissions through the burning of fossil fuels and deforestation from the years 1750 to 1992. Kyoto also highlighted the fact that consumers in developed nations produce 10.4 tons of heat-trapping emissions per year compared to just 2.9 tons produced by consumers in developing nations (Protocol, 2010). This type of assessment, even though factual, places blame and attempts to induce industrialized nations to take responsibility for past transgressions and therefore enters the political realm.

Developed nations of Western Europe have accepted their direct influence on the world’s atmosphere and the consequences of their consumption habits, whereas legislators in the U.S., the world’s largest overall contributor to global warming, have
refused to ratify the protocol to limit emissions. Relying on the long-standing tactic of pitting the environment against the economy, former president George W. Bush stated that ratification of Kyoto treaty by the U.S. would “harm our economy and hurt our workers” (Joyner, 2002).

Climate change has been studied intensively by natural scientists with evidence provided from a number of sources. For example, ice core samples from Antarctica show that carbon dioxide levels had been relatively stable (around 270 ppm) for 2 million years and began to rise about 12,000 years ago as humans started agricultural production. However, this information cannot be directly communicated to the public and is filtered through various institutions, such as the media, business organizations, and political groups. In the early 1990s, sociologist Sheldon Ungar (1992) argued that for scientific knowledge claims to reach the public in a meaningful way it was necessary for those claims, such as the dangerous implications of nuclear power and human-induced global warming, to be coupled with “real-world” events. Ungar theorized the overwhelming positive change in public environmental perception in the early 1990s rested on two events: climate scientist James Hansen’s speech to congress in 1988 and the heat wave experienced across most of the U.S. that summer. More recently, Agrawal (2005) has argued that given enough time, commitment to environmentalism will grow in the public consciousness as climate science and experiential knowledge of local environmental changes accumulate.

There is now an enormous amount of compelling scientific data on the occurrence of climate change coupled with periodic natural disasters of increasing
intensity—heat waves, wildfires, floods, hurricanes, and drought. In the last decade, natural disasters have killed nearly as many Americans as died on 9/11, and in the last 12 years, these events have cost the American taxpayers a combined total of $418 billion. However, the majority of American people and their representatives in Congress are more reluctant than ever to support environmental policies that would regulate carbon dioxide emissions (Dunlap & McCright, 2008). Given this, it seems that Ungar and Agrawal’s hypotheses needs to be examined further to understand the factors that are preventing environmental action. Although, there is no single solution to the current environmental crisis, interpretations of environmental attitudes and behaviors gained through qualitative studies could possibly be key to mitigating the problem of climate change.

**Static Understandings of Human Nature**

Scientists, and the scientific knowledge they produce, often produce bounded understandings of nature. But while scientific knowledge may accurately depict the physical and chemical compositions of the world, knowledge of other aspects may remain partial and conjectural. This becomes problematic when scientific discourses from one field infiltrate another, for example when the language of physics or the biological sciences are used to discuss climate science or economics. Evolutionary biologist Richard Lewontin (1993) argues that the biological sciences, which produce knowledge concerning our connections to all other life forms on the planet, also create a particular ideology of biological determinism in the process. Sophisticated genetic
analysis has established an ideological framework of ‘human nature.’ Discoveries into the physiological and morphological composition of DNA have, for many, solidified this new biological determinism—seeking causal explanations of human behavior based on genetic structures (Keller, 1996).

Lewontin criticizes the field of sociobiology in which male dominance, xenophobia, private property, and heterosexuality are understood as universal components of human nature. The rationale is based on the “appearance” of these phenotypes in large numbers across the human gene pool, thus leading to the notion that these universal phenotypes must correspond to genes that code for them. According to one interpretation of Darwin’s theory of natural selection, the natural conditions of the planet will ‘select’ genes best suited to survive. Most other aberrations in the genetic code producing phenotypes unfit to the natural environment will die. But, for Lewontin, “this theory of human nature is the obvious ideological commitment to modern entrepreneurial competitive hierarchical society” (p. 93).

Sociobiologists further attempt to make comparisons from the behavioral patterns found among non-human societies to reinforce and legitimize the qualities of human societies. As Lewontin points out, in order to examine, or more precisely to justify, the historical truths of slavery, sociobiologists look to colonies of bees and ants. This presents a static and incomplete view of ants, bees, and humans, while simultaneously reducing the complexity and potentialities of the human mind to that of the ant or bee. Ant and bee colonies are known to change in response to different environmental conditions. Of course, humans and the societies they create have been in
dynamic change for thousands of years. By focusing on genetic coding, sociobiologists are assuming that genetic structures are inflexible, and therefore, constructing an ideological version of the nature of human beings and society as pre-determined and static.

Lewontin also finds the environmental movement trapped within this ideological framework of biological determinism when they imagine a utopian balance between humans and nature. The mistake of constructing a generalized and rigid perspective of human nature reduces all human action to static genetic structures and in doing so does not allow for the possibilities to reorganize society, to change the competitive, and often destructive, social structures of the present world. If human actions are determined by malevolent or “selfish” genes (Dawkins, 2006), why work to change the dynamics of society and its interactions with the natural world? It is against this static understanding of an essential human nature that the notion of social construction can be rallied.

**Cognitive Dissonance**

Environmental sociologists use the phrase *intellectual resonance* to describe the way “patterns of understanding that work well across—that resonate with—the range of our experience” (Bell, 2011, p. 96). For example, whereas Darwin’s conceptions of struggle and competition could be used to justify the hierarchical organization of Victorian society and bourgeois capitalism, conceptions of global warming which return power and mystery back to the natural world go against current societal notions of
human control over nature. If nature is socially constructed as an external entity, one that can be dominated and corrected by intelligent, technologically superior human beings, then it follows that no matter what industrial societies heap onto nature, nature will never be able to do anything in return, at least on an apocalyptic, worldwide scale. By this rationale, nature cannot do anything deemed ‘unnatural’. Thus, global warming does not resonate with an understanding ‘nature’ as structured by regular patterns and flows, like tides on a beach, always approaching equilibrium.

Bruno Latour (1993) uses the term ‘factishes’ (which combines fact and fetish) to illustrate the way in which social constructions of nature can be created. People simultaneously interact with the natural world and socially construct it, mixing scientific facts with beliefs. If, as in the case of global warming, the facts (e.g., anthropogenic causes) do not mix well with belief systems, there is a tendency to reject them. For the denier, the facts of climate science as presented by the scientific community are politically charged falsehoods created by liberal elites and academics having nothing to do with the natural, externalized world. Demeritt (2002) describes the use of social constructivism to devalue the credibility of an argument or scientific ‘fact’ as “construction-as-refutation.” Just as Marxist and other scholars critical of capitalism or science employed “construction-as-refutation” tactics to challenge ideological claims made by those in power, politicians and their allies operating out of think-tanks use these tactics to undermine climate science and scientists warning us about climate change. Conservative politicians often make pronouncements such as the “world has always been changing,” “this is part of a natural cycle,” or “this is part of God’s plan,”
reconstructing the dichotomy between humans and nature as well as the “domination of nature” theorization.

The discipline of environmental psychology offers additional insights into the themes of ideology and social construction of climate change. In the 1950s, social psychologist Leon Festinger studied the phenomenon of cognitive dissonance by observing a religious cult calling themselves The Seekers (Winter & Kroger, 2004). Cognitive dissonance, as suggested by Festinger, occurs when an individual holds two conflicting thoughts alongside one another, therefore creating a psychological tension that must be reduced in some way. To reduce this tension, individuals tend to fabricate plausible explanations, no matter how untrue, that sanction a decision they have made. In the case of the Seekers, according to the cult’s leader, Dorothy Martin, a suburban housewife, the world was rapidly coming to an end. She claimed to have been told by highly intelligent aliens, called the Guardians, that the world was going to be consumed by a flood on December 21, 1954. Festinger and his colleagues, having infiltrated the group, found that once the cult members were presented with the psychological crisis posed by their belief that the world was going to end and the opposing reality of a floodless world after the doomsday date had passed, they were able to fabricate explanations to decrease their cognitive tension. After December 21, Martin proclaimed that due to the prayers of the cult members, spreading “good and light,” the world had been spared. In effect, this new explanation simultaneously reduced the tension between fiction and reality while strangely reaffirming and empowering the cult and its leader.
The cognitive dissonance associated with global warming can be explained in similar fashion. Even though climate scientists and others have produced an enormous amount of evidence demonstrating human culpability, millions of Americans claim the science is false. Cognitive dissonance theory would predict that climate skeptics have created, and continue to create, a continuous stream of false, though plausible, rationalizations in order to reduce the tension between the daily realities of a warming world (e.g., the recent Super Storm Sandy that overwhelmed communities in New York and New Jersey), and their belief system which denies the involvement of industrial societies. Festinger also found that once evidence to the contrary (e.g. global temperatures are increasing) was recognized, the believer looks to be supported by other believers. According to Winter and Kroger (2004, p. 57), “Although we like to think our attitudes and behaviors are based on rational and logical assessment of the facts, a brief glimpse at social psychology reveals the enormously powerful (although usually unconscious) influences that other people have on us, our reasoning, beliefs and values, and behavior.” It follows that global warming denial is a social phenomenon and one that could not exist or persist without the continued support of political leaders, newspaper columnists, pundits, and radio personalities. It can be reasonably assumed that, as more evidence of human-induced global warming pours in from climate scientists and from personal experiences, continued support for climate change denial from powerful economic and political groups and their well-paid representatives will also continue to increase.
Factors Shaping Public Perceptions of Climate Change

Qualitative studies of climate change have analyzed the processes through which individual environmental attitudes, beliefs, and behavior are constructed (Pidgeon & Butler, 2009; Johnson, 2012). This section considers the issues that have been discussed in studies of individual perceptions of climate change. In the process, it provides a framework for building a qualitative study as well as analyzing qualitative data.

Personal Experience of Local Weather Patterns

Studies focusing on local perceptions of climate change tend to conclude that scientists and policymakers should seek to connect local experiential knowledges of weather patterns to local regulatory changes, thus possibly bypassing national ideological constructions that promote the denial of climate change (Cutter et al., 2004; Krosnick et al., 2006; Ruddell et al., 2012; Donner and McDaniels, 2013). For example, Ruddell et al. (2010) analyzed public perceptions of high temperatures across the Phoenix area and compared this data to actual temperature measurements in the city. The researchers concluded that since participants in the study perceived climatic changes in ways concurrent with the actual local temperatures over time, scientists were able to effectively communicate climate science to the public in relation to local weather patterns. One possible pathway to understanding public perceptions of climate change is therefore to examine the extent to which such perceptions are drawn from everyday experiences.
Exposure to and Understanding of Scientific Information

Many researchers interested in the way scientists communicate risks and the ways risks are interpreted (or misinterpreted) by the public argue that scientific communication of climate change thus far has not created public awareness in alignment with climate science and its implications (Bostrom, et al., 1994; Leiserowitz, 2004, 2005; Lowe et al., 2006). For example, Bostrom et al. (1994) examined mental models and found that publics could not distinguish between global warming and stratospheric ozone depletion. The misinterpretation of science, in their view, can lead to behavioral changes by publics or policy changes in government which either do not address the problem or lead to ineffective strategies. The extent to which scientific discourse permeates everyday understandings is thus another way in which public understandings of climate change can be gauged.

Media Coverage

Journalists do not consider climate science and slowly developing climatic changes ‘newsworthy’. Galtung and Ruge (1965) advanced eight criteria used by journalists to evaluate the ‘newsworthiness’ of potential news stories: speed of development, threshold, unambiguity, meaningfulness, consonance, unexpectedness, continuity, and the news mix (Castree, 2014). Climatic changes do not readily fall under any of these criteria. Climatic changes are slow to develop, the effects are dispersed and impact ‘unimportant’ people or things, causation is ambiguous, deemed insignificant or
meaningless weather events, mundane and on-going old news, or low-priority in comparison to ‘exciting’ domestic and foreign affairs.

Journalists are also bound by the editorial principles of balance and objectivity and therefore feel compelled to present ‘both sides’ of the climate question. Presenting opposing sides increases the so-called newsworthiness or, more precisely, the dramatic effect of an otherwise mundane issue by inducing a ‘debate’ between a climate scientist and a skeptic. In the process, the media has only heightened the controversial aspects of solid science, elevated professional skeptics, and left the public confused, uncertain, and divided. Dispensa and Brulle (2003) compared U.S. media coverage of climate change to European media outlets and concluded that U.S. media coverage tend to confuse the American public by embracing climate skeptics and equating thousands of legitimate climate scientists to a minority of skeptics. The tactics of these professional skeptics, directly or indirectly funded by the fossil fuel industry, mesh well with journalistic “norms and values” of fairness, balance, and objectivity. Skeptics want to promote uncertainty and cable news networks want to create an equalized sense of dramatic debate. For audiences, debate by two parties given equal stature by way of a split-screen perpetuates the sense of uncertain science in turn providing a basis for inaction (Boykoff & Boykoff, 2004). The media, in line with the imperatives of corporate owners and commercial sponsors, perpetuate cultural norms of material consumption devoid of environmental consequences. Many researchers argue that mass media promote a culture of individualism and conspicuous consumption that can explain low
environmental concern in popular consciousness (Bord et al., 1998; Downs, 1972; Dunlap & McCright, 2008).

**Elite Cues**

A focus on elite cues examines relationships between power and the construction of knowledge by dominant social groups, such as political leaders, media organizations, political think tanks, and religious groups (Etkin & Ho, 2007). Besides analyzing what is included in public discussions, studies focused on discourse also consider what remains hidden or absent in such discussions. By eliminating key issues completely, distorting the syntax, or manufacturing popular rhetoric, influential elites can saturate the “semantic environment” with attractive slogans presenting partisan versions of ‘reality’. In this way, anti-climate change discourse can promote skepticism by framing all forms of environmental regulation at the federal or state level as “big government” intervention. Regulation of industrial capitalism directly counters many of the core conservative ideals of individual freedom, free markets, private property rights, and limited government. Publics respond to these elite cues “from favored ideological and partisan elites that reinforce their pre-existing political beliefs on global warming” (McCright & Dunlap, 2011, p.161). In this way, conservative elites can transform climate change from a physical phenomenon of the natural world to purely a social construction of liberal advocacy groups.
Spatial and Temporal Distancing

In attempts to disseminate their predictions for the future of the global atmosphere and the consequences if societies do not react, climate scientists have constructed spatial and temporal frames in order for publics to understand their responsibility and risk. Unfortunately, by constructing these prospective frames based on various uncertainties, these scientific predictions construct distant temporal frames and spatial orientations, which are outside the range of personal concern for publics. In these terms, responsibility and risk become negligible. Psychologist Tony Leiserowitz’s (2006) study found that concern or anxiety associated with the impacts of climate change, if present, was limited to people and nature in distant regions of the planet while risk perception at the local level was muted. These finding are problematic for the effective communication of risk associated with climate change since temporal and spatial distancing by the general public can legitimize policy inaction at the national level.

Social, Economic, and Political Orientations

If technological advances in the form of new low-carbon consumer products are a potential solution to global warming (Williams et al., 2012), drivers of consumer demand for these products must be understood. Based on the premise that social organizations, daily practices, and individual perspectives motivate behavior, empirical studies hope to improve the understanding of why some consumers choose to purchase low-carbon technologies while others do not (Norton et al., 1998). Social psychologists
also struggle with this question of the attitude-behavior gap and have developed behavioral models to understand why many consumers with pro-environmental beliefs do not purchase and use low-carbon technologies (Peattie, 2010; Wilson and Dowlatbadi, 2007). Consumers may purchase environmentally friendly products based on personal benefits (e.g. cost savings, to convey status) or to promote societal benefits (e.g. reduce pollution, inspire others) or more likely a combination of both private and societal motivations (Brown, 2001).

Even as climate change is a natural phenomenon, the scale at which it unfolds is often distant from everyday experience. Scientific knowledge of climate change also remains distant from everyday knowledge and has to be translated into the popular consciousness through various mechanisms. The extent to which such translations often fail to reflect the viewpoints of climate scientists has been a major puzzle in social studies of climate change, and this is especially true in the case of the U.S. Through utilizing the insights of environmental psychology and delving into previous studies of the shaping of individual environmental perceptions, this chapter sought to build a framework for studying the gap between scientific and everyday understandings of climate change.
CHAPTER FOUR:
RESEARCH METHODS: ANALYZING TEXTS AND INTERVIEWS

This chapter outlines the data collection and data analysis methods utilized in this dissertation. The first section describes the neighborhood of Tampa Palms from which interview respondents were selected. The second section discusses how interview respondents were recruited for the study. The third section details interview procedures and protocol and interview data analysis. The fourth section outlines the texts used to identity institutional discourses of climate change. This chapter sets the stage for the next two chapters, which discuss the main findings of the study.

Study Area: Neighborhood of Tampa Palms

Florida’s urban residents become a useful case study for understanding everyday connections to climate change in three ways. First, according to the EIA (2014), ‘due in part to high air-conditioning use during the hot summer months and the widespread use of electricity for home heating during the winter months, Florida’s retail electricity sales to the residential sector were second in the nation after Texas in 2013.’ High levels of electricity consumption thus are part of everyday life in Florida. Second, the potential for sea level rise, heat waves, destruction of coral reef ecosystems, human health impacts, and greater hurricane intensity are all looming in Florida’s future. This makes
it likely that concerns about climate change should be heightened here. Third, even though there are an average of 300 days of sunshine in Florida every year, only 2.2% of the net electricity generation in Florida comes from renewable sources (EIA, 2012). This relative lack of focus on renewable energy is another aspect of the forms of energy consumption prevalent here.

This dissertation focuses on a suburban community in the Tampa Bay region (Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area); an area characterized by rapid population growth (2.47% per year) coupled with high energy demands. The community of focus, Tampa Palms, is situated roughly 20 miles northeast of downtown Tampa. The boundaries of the community are roughly I-75 to the north and east, the University of South Florida and Lettuce Lake Park to the south, and neighborhoods to the west (see Figure 4.0). Tampa Palms includes 28 separate communities designated as ‘villages,’ and a range of housing types: estates, single family custom home, townhomes, and apartment homes. Tampa Palms is entirely dependent on electricity produced at the Big Bend Power Station, a coal-fired power plant located south of downtown Tampa directly on Tampa Bay.

According to the 2010 U.S. Census, Tampa Palms has 13,515 residents occupying 5,829 households. Most residents are married couples (40%) between the ages of 18-34 (37%), White (70%), with an average per capita income of $44,617 with only 10% of the population living below the poverty level. The study area thus enables a focus on the perspectives of affluent suburban residents pertaining to electricity consumption and climate change. Affluent social groups are usually considered to be highly educated,
environmentally conscious, exhibit higher levels of consumption generally, and produce the largest (per capita) carbon footprint (Gibson et al., 2010).

Figure 4.0. Boundaries of the Tampa Palms neighborhood

Tampa Palms is a picturesque American suburb. Enormous live oak trees line the streets creating a shaded, natural canopy over the homes, sidewalks, parks, and jogging paths. Perfectly maintained lawns and flowerbeds of single-family homes create an idyllic landscape benignly mixing the natural world with the built environment. All the mailboxes are identical, each with the Tampa Palms logo, creating a homogenized, replicating suburban atmosphere. Harris and Larkham (1999) provide a conventional definition of “suburbia” which applies to Tampa Palms. According to the authors, the most common aspects of suburbia include: peripheral location in relation to a dominant urban center, a partly or (wholly) residential character, low densities, often associated
with decentralized patterns of settlement and high levels of owner-occupation, a distinctive culture, or way of life, and separate community identities, often embodied in local governments.

Recruiting Interview Respondents

The target population for this study was residents of the Tampa Palms neighborhood, located within the city limits of Tampa, Florida. The neighborhood was partly chosen for reasons of convenience, being the neighborhood in which I have resided for the past 4 years. Being in an area nominally designated as ‘New Tampa,’ it also serves as an example of the residential neighborhoods, which have sprawled into the more rural areas adjacent to the central core of the city of Tampa.

The respondents for the study were initially located through contacts made via USF Listserv (see Appendix A for email solicitation) and subsequently through snowball sampling. A total of 3,778 emails were sent to subscribers of three USF listservs deemed most relevant for this study. Table 4.0 summarizes the targeted

Table 4.0. ListServs Contacted to Recruit Interview Respondents

<table>
<thead>
<tr>
<th>Listserv Title</th>
<th>Description</th>
<th>Number of Subscribers</th>
<th>Date Sent</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
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<td>JustTalk</td>
<td>Social justice programs and events</td>
<td>94</td>
<td>10-31-2013</td>
<td>1</td>
</tr>
<tr>
<td>LeadServeTalk</td>
<td>Leadership and civic Engagement</td>
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<td>10-31-2013</td>
<td>1</td>
</tr>
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<td>USFTalk</td>
<td>An open talk forum for the USF community</td>
<td>932</td>
<td>10-31-2013</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3,778</td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>
listservs. Respondents were informed that they had to be at least 25 years of age and current residents of Tampa Palms to be included in this study. Emails to the listserv elicited seven total respondents. From these seven, two were ineligible for participation in the interview because they did not live within the actual boundaries of Tampa Palms (the 28 “Villages” in the jurisdiction of the Tampa Palms Homeowners Association). The remaining five respondents agreed to take part in the research along with their partners, and in turn referred potential respondents.

Figure 4.1. Snowball Sampling to Recruit Interview Respondents

An additional 53 potential participants contacted the researcher for more information, and of these, 49 met the criteria for inclusion in the study (3 were
excluded since they were younger than 25). Ultimately, a total of 46 participants agreed to take part in the study: 28 women and 18 men between the age of 25 and 80 years (see Table 6.0 for list of interview respondents). In terms of households, two respondents each were drawn from 15 households, and one respondent each from 16 households. Figure 4.1 illustrates the results of the snowball sampling.

In terms of gender, there were 28 women and 18 men in the sample. The youngest respondent was 20 years of age and the oldest was 80. Seven respondents were above the age of 60 years and 14 were below 30, so that 21 respondents (54% of the sample) were between 30 to 60 years of age. Thirty-two respondents (70% of sample) identified as White, 11 as Black, 2 as Asian, and one as Hawaiian and Pacific Islander. All respondents had attended college, and 6 had doctoral degrees. Eighteen respondents (39% of sample) belonged to households, which had an annual income above $100,000, 7 (15%) belonged to households with income below $50,000 per year, and the remaining 21 (46%) had incomes between this range. Expenditures on electricity range from less than $100 to more than $250, possibly reflecting differences in size of homes. Twenty-two respondents (48% of sample) identified as Democrat, 13 (28%) as Republican, 8 as independent, 2 as having no affiliation, and one as Libertarian. Overall, the interview respondents were majority White, college educated, relatively well off, and tended towards being Democrat in their political affiliation. Table 4.1 below describes the socioeconomic characteristics of the 46 interview respondents.
## Table 4.1. Interview Respondents

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Gender</th>
<th>Age</th>
<th>Marital Status</th>
<th>Edu*</th>
<th>Politics</th>
<th>Race/Eth+</th>
<th>Income</th>
<th>Energy Cost (USD/mo)</th>
<th>Sources of Information</th>
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<td>Black/AA</td>
<td>100-149K</td>
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<td>100-150</td>
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<td>150K+</td>
<td>250+</td>
<td>Network TV</td>
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<td>40-49K</td>
<td>&lt;100</td>
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</table>

* denotes someone self-identified as Hispanic or Latino  
† denotes a member of the initial 5 groups of participants  
*Education: 1= No HS Diploma, 2=HS Grad/GED, 3=Some college <1, 4=Some college >1, 5=Associates, 6=Bachelors, 7=Masters, 8=Professional degree, 9=Doctorate  
*Employment: E=Employed, R=Retired, SE=Self-employed, H=Homemaker
Table 4.2. classifies the main source of information for interview respondents by their political affiliation. All sources of information are evenly represented in the sample, with a slight edge held by network TV channels. Newspapers are also a main source of information for the respondents, especially Democrats. In terms of cable channels, more Republicans cited Fox as their main source of information than Democrats and the situation was the opposite for MSNBC. This is not surprising since Fox is most likely to represent the Republican viewpoint and MSNBC provides similar coverage to Democrat viewpoints. It is worth noting though that neither MSNBC nor Fox dominate as the source of information for either political group. Across the sample of respondents, therefore, there is no single main source of information.

Table 4.2. Interview Respondents by Political Affiliation and Main Source of Information

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>CNN (cable)</th>
<th>MSNBC (cable)</th>
<th>Fox (cable)</th>
<th>Network TV</th>
<th>Radio</th>
<th>Newspapers</th>
<th>Social media</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democrat</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>22</td>
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<tr>
<td>Republican</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>11</td>
<td>7</td>
<td>10</td>
<td>8</td>
<td>46</td>
</tr>
</tbody>
</table>

**Interview Process and Data Analysis**

Semi-structured interviews were conducted to understand environmental perceptions of residents in the case study neighborhood. Semi-structured or interview guide approaches are often described as focused, ‘free-form’ conversations (Kitchin and Tate, 2000). New themes may develop here if the conversation leads to areas not
considered in the initial layout of the study. As new themes develop, previous ones may be eliminated. Conducting interviews in this way can allow the conversation more freedom than a structured interview. A semi-structured approach increases the dialogue between researcher and respondent as the interview process through which meanings are attached to experiences is expanded. As many meanings may be hidden in the subconscious or masked by social structures, an open interview style can stimulate deeper understandings. Alongside, the research framework also becomes more relevant to respondents as interview questions continue to be modified based on questions raised in the field. However, this freedom also has the potential create unfocused information hindering the comparability of data and relevance of the study. Remaining cognizant of the initial interview guide is this important, so that topics relevant both to the research and to the respondent continue to be covered.

The interview guide was designed to understand environmental perceptions of the respondents in relation to climate change, electricity production and consumption, and broader environmental concerns. Thus, interviews gathered information pertaining to personal knowledge and representations of socio-ecological relationships in the suburban context. The interview questions were created and refined using an iterative method, informed by the literature on public opinion of climate change and broader studies on qualitative research methodologies. The approved interview questions are provided in Appendix D. All interviews were conducted within personal residences in order to enable the examination of individual “micro-geographies” — meanings of place and connections to the natural
world (Elwood and Martin, 2000). The interviews occurred between October 2013 and January 2014. Confirmatory phone calls, emails, or text messages, along with informed consent documents, were sent to participants in preparation for the meeting. Interviews were audio recorded using a small digital recorder and lasted between 30 minutes to 65 minutes.

The interview began with a review of the informed consent document (see Appendix B for the approved IRB informed consent form) and participant’s initial questions were addressed as they arose. Next, informed consent was obtained from the study participants and the participants’ signed the acknowledgement of understanding. The participants then completed a written survey to determine basic demographic information, including residential data, household information, and average electricity consumption levels (see Appendix C for approved survey form). Verbal interviews were then conducted and recorded based on the interview guide (see Appendix D for approved interview guide).

Interviews were transcribed by hand after each interview and each respondent was assigned a pseudonym. The names were contrived in alphabetical order with no association with actual respondent names. Responses were manually coded in accordance with themes present in the interview guide. For each set of interview themes, the responses that best represented the overall views of the respondents was selected, as well as responses that denoted the range of views. Interview transcripts were loaded into Atlas.ti© qualitative data analysis software which enabled content and discourse analysis of the unstructured data via electronic highlighting, quote extraction,
and theme development. The automatic coding was used to supplement manual coding in case pertinent responses had been missed during the manual coding process.

**Identifying Dominant Discourses of Climate Change: Textual Analysis**

To cover the range of institutions involved in constructing dominant discourses of climate change, this study analyzed selected texts on climate change produced by national-level governmental, corporate, and non-governmental institutions. Table 4.3 lists the texts analyzed for this dissertation. Texts were chosen so as to represent polarized positions regarding climate change, and were divided between, first, those which viewed climate change as a catastrophic event for which human activities were responsible and which required immediate action (governmental agencies and environmental groups) and second, those which viewed climate change science as lacking in rigor and the process itself as a natural part of the Earth’s environmental history (conservative think-tanks and energy companies). The first set of viewpoints was represented by reports from governmental agencies and scientific organizations, with the two often intersecting with each other. Environmental groups were also analyzed since these exemplified the catastrophic view of climate change. This set of viewpoints often maps onto Democrat pronouncements on climate change. The second set of viewpoints was provided by think-tanks which have played a prominent role in casting doubt on climate change and supporting business-as-usual. These views often link with the views of Republicans on climate change. This set also covers pronouncements by TECO (the Tampa Electric Company), the company serving the
<table>
<thead>
<tr>
<th>Organization</th>
<th>Title</th>
<th>Author</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Enterprise Institute</td>
<td>The Climate Change Climate Keeps Changing, but the Carbon Tax Is Eternal</td>
<td>Zycher, B.</td>
<td>2013</td>
</tr>
<tr>
<td>Cato Institute *</td>
<td>Cato Handbook for Policymakers</td>
<td>Michaels, P.</td>
<td>2009</td>
</tr>
<tr>
<td>Earth System Science Center, University of Alabama</td>
<td>Statement to the Environment and Public Works Committee of the US Senate</td>
<td>Spencer, R.W.</td>
<td>2013</td>
</tr>
<tr>
<td>Natural Cycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center for the Study of Carbon Dioxide and Global Change</td>
<td>Carbon Dioxide and Global Warming: Where We Stand on the Issue</td>
<td>Idso, C. D. &amp; Idso, K. E.</td>
<td>1998</td>
</tr>
<tr>
<td>Competitive Enterprise Institute</td>
<td>An Issue of Science and Economics</td>
<td>Murray, I.</td>
<td>2010</td>
</tr>
<tr>
<td>Global Research</td>
<td>Global Cooling is Here: Evidence for Predicting Global Cooling for the Next Three Decades</td>
<td>Easterbrook, D. J.</td>
<td>2008</td>
</tr>
<tr>
<td>Heartland Institute</td>
<td>Nature, Not Human Activity, Rules the Climate</td>
<td>Singer, F. S</td>
<td>2008</td>
</tr>
<tr>
<td>Hoover Institution*</td>
<td>Global Warming: Boon to Humans and Other Animals</td>
<td>Moore, T. G.</td>
<td>1995</td>
</tr>
<tr>
<td>Environmental Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Center for Climate and Energy Solutions (C2ES)</td>
<td>Climate Change 101: Understanding and Responding to Global Climate Change</td>
<td>C2ES</td>
<td>2011</td>
</tr>
<tr>
<td>GreenPeace*</td>
<td>Point of No Return: The massive climate threats we must avoid</td>
<td>Voohar, R. &amp; Myllyvirta, L.</td>
<td>2013</td>
</tr>
<tr>
<td>Sierra Club</td>
<td>Locked-in: Financial risks of new coal-fired power plants in today’s volatile international coal market</td>
<td>Buckheit, B.</td>
<td>2012</td>
</tr>
<tr>
<td>World Watch Institute</td>
<td>Carbon Offsets 101</td>
<td>Kollmuss, A.</td>
<td>2007</td>
</tr>
<tr>
<td>Government (and scientists)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Climate Assessment and Development Advisory Committee</td>
<td>Federal Advisory Committee Draft Climate Assessment</td>
<td>NCADAC</td>
<td>2013</td>
</tr>
<tr>
<td>U.S. Environmental Protection Agency</td>
<td>Climate Change Science Overview</td>
<td>U.S. EPA</td>
<td>2013</td>
</tr>
<tr>
<td>Burning coal is vital to economic prosperity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Coalition for Clean Coal Electricity*</td>
<td>The Social Costs of Carbon? No, the Social Benefits of Carbon</td>
<td>ACCCE</td>
<td>2014</td>
</tr>
<tr>
<td>Electric Power Research Institute</td>
<td>2011 Generation Annual Overview</td>
<td>EPRI</td>
<td>2012</td>
</tr>
<tr>
<td>The National Coal Council</td>
<td>The Urgency of Sustainable Coal</td>
<td>The National Coal Council</td>
<td>2008</td>
</tr>
<tr>
<td>Rocky Mountain Coal Mining Institute</td>
<td>A Strategy For America’s Energy Independence with Coal</td>
<td>RMCMI</td>
<td>2013</td>
</tr>
<tr>
<td>TECO Energy</td>
<td>A Tradition of Environmental Action, Innovation and Stewardship</td>
<td>TECO Energy</td>
<td>2014</td>
</tr>
</tbody>
</table>
case study neighborhood, and energy-related think-tanks which focus on popularizing the use of coal.

The texts utilized included white papers, handbooks for policymakers, scientific articles and reports, governmental reports, reports published by environmental advocacy groups, and online articles and reports. Each document was analyzed to understand the claims made, the basis of the argument, the authority of the speakers, and the specific political, economic, or social recommendations provided to solve climate change. This method of textual analysis was borrowed from Malone’s (2012) study titled ‘Debating Climate Change: Pathways Through Argument To Agreement.’ Texts were then grouped to collate similar institutional perspectives, and common themes, claims and evidence, policy recommendations, worldviews, and common views on climate change were identified. Alongside, a specific text was chosen which best exemplified the main argument and evidence found in each institutional group.

This chapter has outlined the methods and procedures utilized to conduct a qualitative study on institutional discourses and individual perceptions of climate change. The next chapter analyzes documents to identify the main arguments about climate change as represented by various political and economic entities, followed by a chapter which details the interview findings.
CHAPTER FIVE:
INSTITUTIONAL DISCOURSES OF CLIMATE CHANGE: ANALYZING KEY TEXTS

This chapter draws from some key texts associated with the debate on climate change to lay out the main positions of contending parties. The chapter is divided into five sections: the first two sections represent the viewpoints of governmental agencies and environmental groups which make the case for taking action on climate change; the remaining three sections focus on pronouncements by think-tanks, politicians from the Republican party, and energy companies which seek to cast doubt on climate change. These arguments for and against the occurrence of climate change provide a basis for comparison with the perspectives of interview respondents outlined in the next chapter.

**Governmental Agencies: Addressing Climate Change**

In a recent speech that was well received by environmental groups, President Obama proclaimed that U.S. energy and regulatory policies would be strengthened and climate change would be taken seriously. Yet, regulatory policies to deal with greenhouse gases (GHGs) have historically been, and will likely continue to be, stalled or rejected by partisan politics or delayed in courts by the fossil fuel industry and its
allies. Currently, the U.S. is the world’s second-largest emitter of carbon dioxide, has no national climate policy, has not ratified the Kyoto Protocol, and ranks poorly on most environmental indices including the Environmental Sustainability Index (ESI) and the Environmental Performance Index (EPI). The largest decline in carbon dioxide emissions in the U.S. over the last 20 years was recorded in 2009, but this decline was largely related to economic factors and not regulatory policy (EIA, 2014). Consequently, the U.S. projects a history of anemic climate policies to the world reflecting a divided electorate.

U.S. governmental agencies in the present appear to accept scientific perspectives on the occurrence of climate change research and call for policy changes to address the climate crisis. According to the 2014 Climate Action Report of the U.S. Department of State,

Climate change represents one of the greatest challenges of our time, with profound and wide-ranging implications for development, economic growth, the environment, and international security. The United States is committed to continuing enhanced action, together with the global community, to lead the global effort to achieve a low-emission, climate resilient future (U.S. DOS, 2014, p. 50).

Quoting national and international climate organizations, such as IPCC and NOAA, the Department of State argues that,

Climate change is no longer a distant threat. Average U.S. temperature has increased by about 1.5°F (0.8°C) since 1895; more than 80 percent of
this increase has occurred since 1980. The warmest year ever recorded in the contiguous United States was 2012, when about one-third of all Americans experienced 10 days or more of 100-degree heat. Globally, the 12 hottest years on record have all come in the last 15 years (U.S. DOS, 2014, p. 7).

Besides scientific authorities, recent assertions from governmental agencies draw on the discourse of sustainability while also keeping sight of economic prosperity. As the Department of State puts it,

We have an obligation to current and future generations to take action to meet this challenge. By building on important progress achieved during the President’s [Obama’s] first term, the United States plans to meet its commitment to cut GHGs in the range of 17 percent below 2005 levels by 2020 and make additional progress in forging a robust international response to this global challenge. We will also improve our ability to manage the climate impacts that are already being felt at home and around the world. Preparing for increasingly extreme weather and other consequences of climate change will save lives now and help to secure long-term American and global prosperity (U.S. DOS, 2014, p. 7).

Touting past achievements and plans for the future, the report lists policies to address climate change.

During 2009-2011, average U.S. GHG emissions fell to the lowest level for any three-year period since 1994-1996. To build on this progress, the
Obama administration is putting in place robust new rules to cut GHG emissions. The plan includes such steps as developing the first-ever national carbon pollution standards for both new and existing power plants, under the Clean Air Act; establishing post-2018 advanced fuel efficiency and GHG emission standards for heavy-duty vehicles; setting a new goal to double electricity generation from wind and solar power; boosting energy efficiency in appliances, homes, buildings, and industries; reducing emissions of highly potent hydrofluorocarbons (HFCs); developing a comprehensive methane emissions reduction strategy; and advancing efforts to protect our forests and other critical landscapes (U.S. DOS, 2014, p. 7).

Yet, attempts to regulate polluting industries are not as straightforward. Consider the U.S. Supreme Court’s ruling (Massachusetts versus EPA, 2007) which determined that carbon dioxide and other greenhouse gases (GHGs) qualify as “air pollutants” under the Clean Air Act therefore giving the Environmental Protection Agency (EPA) increased regulatory authority over the fossil fuel industries. Five years after the court’s ruling, the EPA proposed new emission rate standards after reviewing over 2 million comments from the public. The EPA plans to apply the standards for new fossil fuel power plants before the end of 2013 and may propose standards for existing power plants in 2014, all while many carbon regulatory bills, such as the American Clean Energy and Security Act of 2009 (also known as the Waxman-Markey Bill, a cap-and-trade bill proposed by two Democrats), have languished in Congress. Support at the
governmental level, thus, is only one side of the picture, as the opposition to environmental regulations proceeds alongside.

**Environmental Groups: Climate Change as Catastrophic**

Environmental activists often begin their discussion of climate change with a litany of calamitous predictions. These predictions are founded on scientific information acquired from, most often, the United Nations Framework Convention on Climate Change (UNFCCC), Intergovernmental Panel on Climate Change (IPCC), the National Research Council (NRC), part of the U.S. National Academies for scientific research, the Energy Information Administration (EIA), which is part of the U.S. Department of Energy, and the International Energy Agency (IEA), an intergovernmental agency that maintains statistical data on world energy supply. For environmental advocates, anthropogenic climate change is very real and occurring at a rapid and accelerating pace. The fossil fuel industry, along with the governments, are allowing “dirty” industries to operate and emit massive amounts greenhouse gases are responsible for the disastrous problems the world faces due to climate change. With widespread adoption of innovative “green” technologies and energy efficient buildings and cars, a conversion to renewable energy could work, in tandem with the complete elimination of all fossil fuel burning power plants, they argue, if global temperature are to be kept from increasing by more than 2°C. Often, such environmental group reports use predictions at the far end of the range of possible climate outcomes. For example, the IPCC predicts gradual warming of up to 2°C in the next century, whereas, reports in
this group use 5-6°C as the most likely range the world will face in the next 100 years or sooner unless major structural changes to energy production and consumption are implemented.

Greenpeace’s 2013 report *Point of No Return*, is a representative example of the environmentalist position. According to the report, without drastic cuts in global carbon emissions, the world can expect more extreme storms, melting of polar ice-caps, sea-level rise, heat waves, droughts, wildfires, water shortages, crop failures, biodiversity losses, and the spread of diseases. All of these catastrophic scenarios are linked in the report to economic losses and hardships for both people and businesses as the result of damages to the infrastructure or to crop yields. In the words of the report,

The world is quickly reaching a Point of No Return for preventing the worst impacts of climate change. Continuing on the current course will make it difficult, if not impossible, to prevent the widespread and catastrophic impacts of climate change. The costs will be substantial: billions spent to deal with the destruction of extreme weather events, untold human suffering, and the deaths of tens of millions from the impacts by as soon as 2030 (Voorhar et al., 2013, p. 5).

Attempting to debunk the argument made most often by conservative groups which holds that environmental regulations, including the elimination of coal-fired power plants, will result in an economic disaster and job losses, this report finds that over 22.6 million clean energy jobs can be added to economy by 2020 and over 37% of electricity can be produced by renewables (geothermal, wind, hydropower and solar). Of course, a
systematic conversion of this type would, as the report states, require an initial investment from the federal government of $1.2 trillion.

While such a position can be considered ‘alarmist,’ it may also be a more realistic appraisal of the climate change problem, and is one that does not shy away from hard truths. However, in pushing renewables, such environmental activism often continues to tie itself to profit-based market structures, instead of pushing for a new form of environmental accounting.

Think Tanks: Climate Science as Flawed

Think-tanks which make the case against climate change aim to provide a scientific veneer to calls for business-as-usual, working to both debunk the science of climate change and ensure that nothing is done by way of addressing the problem. Most commentaries in this way begin by admitting that one or more aspects of climate science are undeniable and in fact true, thus casting themselves and their advocacy groups as reasonable, objective scientists who have a deep, technical understanding of the science and can interpret subtle nuances of complex scientific methods and findings for policymakers and the public. Jacques et al. (2008, p. 355) designate such right-wing think tanks as “non-profit, public policy research and advocacy organizations that promote core conservative ideals such as ‘free enterprise’, ‘private property rights’, ‘limited government’ and ‘national defense’”.

Figure 5.0 represents a common visual utilized by scientists and analysts employed by rightwing think tanks. The graph from the Heartland Institute
demonstrates a “zero trend” of temperature fluctuations as recorded from a weather station at Mauna Loa, Hawaii, presumably the same station used by the prominent atmospheric scientist, Charles Keeling, to record measurements for the first long-term study of carbon dioxide emissions. As the graph shows, carbon dioxide levels have been increasing, but the “zero trend” in temperature fluctuations is said to prove that this increase in greenhouse gases has no direct effect on the average global temperatures.

Figure 5.0. Graphic from Heartland’s Center on Climate and Environmental Policy

For advocates in this group, crucial to climate denialism is the creation of uncertainty in climate science. Thus, James Taylor writes in an article entitled, “Climate Alarmists Trash IPCC Cold Spell Predictions,” that,
Global warming alarmists are defying the “settled science” of the United Nations Intergovernmental Panel on Climate Change, with alarmists now claiming global warming causes more frequent and severe cold spells [while an IPCC report had mentioned that it would cause fewer cold spells]. ... Somebody please get the global warming alarmists to hole up in a room somewhere, debate each other about whether global warming causes more or less severe cold spells, and then let us know when they have a consistent answer (Taylor, 2014).

In conjunction with this uncertainty, scientists from the IPCC and environmental groups are represented as “alarmists” inaccurately raising fears of dire consequences in the course of the next century unless industrialized nations act to reduce emissions.

A representative example of the scientifically based climate change denial is provided by Patrick Michaels in the Cato Institute’s Handbook for Policymakers (2009). Michaels begins with the admission that, “global warming is indeed real, and human activity has been the contributor since 1975.” But he continues with the assertion that global warming has actually “stopped” in recent years since “there has been no net change in the earth’s average temperate in the last 11 years.” Thus, carbon emissions, which have continued to rapidly increase during this period, have to be dissociated from global temperature increases, which can be then be attributed to El Nino or other natural anomalies. Michaels brings in the economic costs of regulation as an argument against emissions control policies.
Passage of S. 2191 [Lieberman-Warner Climate Security Act] would create an economic disaster. It requires emission reductions to 2005 levels by 2012, 15 percent below 2005 levels by 2020, 33 percent below by 2030, and 66 percent below by 2050. This is an enormously expensive undertaking (with aggregate costs totaling trillions of dollars) with no real climatic gain. Because of growth in emissions since 1990, the actual result of this bill is to lower emissions by only 11 percent from 1990 levels by 2030, and 25 percent by 2050 (Michaels, 2009, p. 483-484).

Michaels also casts doubts on the predictive ability of climate scientists, emphasizing that “no one can possibly project the energy future of our society 100 years from today, much less 1,000 years.” The policy implication to be drawn from his suggestion is that “Congress should pass no legislation restricting the emission of carbon dioxide.”

By decoupling carbon dioxide emissions from temperature fluctuations, right-wing commentators seek to represent climate change as a natural phenomenon completely outside the control of human beings. By claiming that scientific evidence from proxy sources, such as tree rings or ice-core samples, cannot definitely show which came first, temperature increases or carbon dioxide level increases, an uncertainty is inserted in current climate science: the world may be warming now, but this should not be attributed to carbon dioxide emissions. Therefore, the regulation of these emission would not only be detrimental to the economy, but would have no effect on the ‘natural’ warming or cooling trends of the Earth.
Rather than negative effects, right-wing commentators have argued that warmer temperatures across the planet will be a “boon to humans and other animals” (Moore, 1995). For instance, in a report entitled Carbon Dioxide and Global Warming: Where We Stand on the Issue (1998) from the Center for the Study of Carbon Dioxide and Global Change, a non-profit founded by Craig Idso, former director of environmental science at Peabody Energy, the world’s largest privately owned coal company, it is stated that, “the aerial fertilization effect of atmospheric CO2 enrichment: enhanced plant growth, increased plant water use efficiency, greater food production for both people and animals, plus a host of other biological benefits too numerous to describe in this short statement” (Idso, 2013). The report concludes that increased carbon dioxide levels will actually cool the planet by increasing the levels of “water-and ice-nucleating aerosols” produced by the growth in plant productivity.

Another representative example of this position is provided in Thomas Moore’s Why Global Warming Would be Good for You (1995), published by the Hoover Institution. The crux of Moore’s argument is that, “a rise in world-wide temperatures will go virtually unnoticed by inhabitants of the advanced industrialized countries.” Though Moore agrees the planet is warming, he naturalizes the current warming trends by setting them into his account of the historical record of the planet. He contends that warm periods and periods of extremely high carbon dioxide levels in the distant past (60 million years ago) did not have a large negative effect on the biotic world. According to Moore, it is “simply hubris to believe that Homo sapiens can affect temperatures, rainfall, and winds.” Instead of investing in mitigating climate change,
Resources could be better spent on promoting investment and growth in the poorer countries of the world. Should warming become apparent at some time in the future and should it create more difficulties than benefits, policy makers would have to consider preventive measures. Based on history, however, global warming is likely to be positive for most of mankind while the additional carbon, rain, and warmth should also promote plant growth that can sustain an expanding world population (Moore, 1995, p. 24).

**Producing a Political ‘Climate of Denial’**

The above studies by think-tanks have often formed the basis for anti-climate change pronouncements by politicians, often belonging to the Republican party. To understand the real challenges to serious climate regulation in U.S., one needs to appreciate the political challengers: hardline opponents of carbon regulation operating in positions of power and influence. Any cursory search for climate denialism in the U.S. will reveal nearly daily pronouncements made by right-wing politicians against climate science and scientists, or science in general. These claims loosely fall into one or more of the following categories: economic, political, moral, emotive, religious, or anti-scientific. Speaking to the Evangelical Christian wing of the Republican Party, U.S. Representative Randy Neugebauer (Republican-Texas) stated that,

> We know the climate's changing. Since when Christ created this Earth, it's changed. Should we do things that are prudent and make sense to be
good stewards of Mother Earth? Absolutely. But I think some people over
exaggerate our ability to have much influence over that process
(Lehmann, 2013).

Railing against the League of Conservation Voters (LVC), U.S. Senator Ron Johnson
(Republican-Wisconsin) equated environmentalism with terrorism, proclaiming that,

The League of Conservation Voters is one of the many attack dog groups
used by President Obama, the Democrats and the extreme left to weaken,
defeat and silence conservatives. They use TV ads -- filled with smears --
because they work. They are an extreme left group on an environmental
jihad (Abrams, 2013).

Senate hopeful Ken Buck of Colorado, on a tour of his state with outspoken climate
denier, U.S. Senator James Inhofe (Republican-Oklahoma), embraced Inhofe’s views,
telling the crowds, “Senator Inhofe was the first person to stand up and say this global
warming is the greatest hoax that has been perpetrated. The evidence just keeps
supporting his view, and more and more people’s view, of what’s going on” (Johnson,
2010).

In such pronouncements, scientists face especial criticism. Questioning the
integrity and autonomy of all climate scientists during a radio interview, U.S.
Representative Mike Coffman (Republican-Colorado) argued that in order to get
research grants, scholars must

…submit to the … orthodoxy of climate change by the radical
environmentalists. One thing that I certainly read, from viable sources, is
that a lot of the research that’s being done, if you don’t, when you put your application in to get a grant, if you don’t submit to the, you know, orthodoxy of climate change by the radical environmentalists you’re not going to get a grant (Bigmedia.org, 2013).

U.S. Representative Ted Poe (Republican-Texas), in an attempt to discredit scientific credibility altogether, said that,

The consensus has been for some time that global warming, climate change, continues because man is the perpetrator. Now we are beginning to learn that may not be true, that there is not a consensus that there is global warming or climate change. We now have heard about Climategate, where the expert scientists hid emails in England that disagreed with the so-called consensus that there is global warming and global climate change. We have heard now new evidence that even NASA is involved in not revealing evidence that contradicts climate change (Rep. Poe, 2009).

Recently, the U.S. House Energy and Commerce Subcommittee on Energy and Power questioned the Secretary of Energy, Dr. Ernest Moniz, and EPA administrator, Gina McCarthy, on President Obama’s Climate Change Action Plan. In his opening statement, Subcommittee Chairman, Ed Whitfield (Republican-Kentucky), denied the significance of human activities on the planet stating that only “3.75 percent of all worldwide emissions come from human activity.” During the same hearing, U.S. Representative David McKinley (Republican-West Virginia) told McCarthy and Moniz,
“here is the reality of temperature changes over the last 40 years — actually we can say over 40 years, there has been almost no increase in temperature” (U.S. House of Representatives, 2013). Following the ‘natural process’ line of thought, U.S. Representative Jeff Denham (Republican-California) stated that,

We don’t have complete factual information yet. From what I have seen the Earth has heated and cooled on its own for centuries. I don’t know that there’s anything that is a direct cause of that right now, but we can do a better job of cleaning up our planet (Rogers, 2008).

At a recent event funded by Americans For Prosperity, the lobbying arm of Koch Industries, U.S. Representative Steve King (Republican-Iowa) remarked that climate change is not proven, it’s not science. It’s more of a religion than a science. Everything that might result from a warmer planet is always bad in [environmentalists’] analysis. There will be more photosynthesis going on if the Earth gets warmer…And if sea levels go up 4 or 6 inches, I don’t know if we’d know that… We don't know where sea level is even, let alone be able to say that it's going to come up an inch globally because some polar ice caps might melt because there's CO2 suspended in the atmosphere (Sutter, 2013).

Denial of climate change has consequently become an accepted form of thought for those on the Right, an emotionally charged form of resistance to liberals. To consider climate change is deemed anti-social behavior and can be political suicide for any
Republican candidate or incumbent (McCright and Dunlap, 2011). One could be cast out or labeled a RINO (Republican In Name Only) within the party. Adherence to the customs and beliefs of the group form a stronger and easier basis of thought patterns. Very few want to entertain thoughts that go against the group, much less speak out and act upon facts inconsistent with the current dogma, especially if the facts are seen as supported or presented by an opposing side.

By far the greatest opposition is to a carbon tax, or any form of cap-and-trade, which is an emissions regulation policy that has been applied in European contexts. Many U.S. business leaders on the right, neoconservatives and libertarians alike, will stand in the way of any such legislation, and spend millions lobbying members of Congress to do the same. In the 112th Congress (2011-2013) alone, House Republicans sponsored and voted on 95 bills intended to dismantle the Clean Air Act (Committee on Energy and Commerce, 2013). Recently, the companies Koch Industries and Halliburton teamed up with Congressional Republicans, notably U.S. House Majority Leader, Eric Cantor (Republican-Virginia) and U.S. Senator Jim Inhofe (Republican-Oklahoma), the ranking member of the Committee on Environment and Public Works, to lobby for an anti-carbon tax resolution in the House. The purely symbolic resolution (H.CON.RES. 24) states, in part that, “expressing the sense of Congress that a carbon tax would be detrimental to the United States economy[,] ... a carbon tax would be detrimental to American families and businesses, and is not in the best interest of the United States” (Sen. Vitter, 2013).
If elites in the U.S. hope to use carbon trading schemes to capitalize on new ‘ecological’ market mechanisms, one would think many on the Right would be pushing Congress (especially during the Bush Administration) to ratify the Kyoto Protocol or comparable trading schemes. Just the opposite is true. Most notably, the influential oil and gas billionaires, Charles and David Koch, use their immense wealth and political influence to threaten any Republican politician with a primary challenge if they were to sign legislation faintly resembling a regulatory or tax bill (Dunlap and McCright, 2011).

In response to the Waxman-Markey cap-and-trade bill proposed in 2009 (H.R. 2454), the home page of the ‘No Climate Tax’ website states the following:

Don't Use Climate Change to Hide Tax Hikes! *A climate bill should not be a vehicle for hiding a tax hike. Let your elected officials know that you're watching how they vote on hidden energy taxes.* Congress is debating the largest tax increase in history, the cap-and-trade energy tax. Cap-and-trade is a tax on coal, oil, and natural gas but instead of being a specific tax rate, the total level of use is capped and companies are forced to pay the government for emissions permits. They bid against each other to stay in business, and nobody knows how much the tax will be until they hold the auctions. It’s a crazy, unpredictable tax, but it's certainly a tax (NoClimateTax.com, 2013).

In their push for deregulation in the energy sector, the Kochs have collected signatures from Senators, Congressmen, Governors, and other elected officials to their ‘No Climate
Tax Pledge’ through the libertarian organization, Americans For Prosperity, which they founded in 2004.

**Energy Companies: Burning Coal is Vital for Economic Prosperity**

Fossil fuels are represented as the key component of modern civilization by coal-based power companies, and as a component that must continue if societies are to be economically prosperous. The reports released by energy companies or research groups for energy companies connect economic issues, job opportunities, and high standards of living to the low cost of coal. According to this worldview, coal is beneficial to society since it is burned to produce electricity, a vital component of modern life. They suggest that the more coal that is burned, free of governmental regulation, the lower the cost of electricity will be for consumers. Since global energy demand will continue to increase, coal will play a substantial role in energy production over this century. In fact, they suggest the world *benefits* from excess carbon dioxide production since plants require this atmospheric gas to grow. Hence, the more carbon dioxide in the atmosphere (referred to as atmospheric CO$_2$ enrichment) the higher crop yields will be around the world and therefore more people than can be fed. Not only do they think yields will surge, but the quality of the crops will be greatly increased. Even if carbon emissions become problematic, these reports suggest that carbon sequestration technologies (carbon capture and storage, CCS), such as injecting CO$_2$ into the oil wells to force oil to the surface, are ever-improving and can therefore solve the problem of over accumulation of carbon dioxide in the atmosphere.
The American Coalition for Clean Coal Electricity (ACCCE) provides a representative example of this position. In its 2014 report, Social Costs of Carbon? No, Social Benefits of Carbon, the ACCE declares that,

Electrification is the world’s most significant engineering achievement of the past century, and has been ranked as the world’s second most significant innovation of the past 6,000 years, after the printing press. Electricity has created, shaped, and defined the modern world, economic growth and electricity usage are closely correlated, and electricity has facilitated virtually every technological achievement of the past 150 years (p. 6).

Coal-based electricity presumably has contributed to this technological progress through electricity.

According to all major forecasts available, fossil fuels will remain the principal sources of energy worldwide for the foreseeable future and will continue to supply 75 - 80 percent of world energy. Demand for oil, natural gas, and coal will increase substantially in both absolute and percentage terms over the next several decades. Assuring continued world economic growth, increased per capita income, and rising living standards requires this greatly increased use of fossil fuels (ACCCE, 2014, p. 29).

Proponents of coal seek to dismiss negative health or environmental outcomes arise from the burning of coal, or they attempt to show that energy companies are in compliance with environmental regulations. TECO (the Tampa Electric Company),
which is the coal-based electricity supplier in this dissertation’s case study neighborhood, maintains on its website that, “ad hoc regulation can lead to consequences, including fuel switching, over-reliance on a few fuels, reliability concerns and potential rate shock as markets fluctuate (TECO, 2013). To counter negative public perceptions concerning coal-based electricity production, TECO’s website lists the many ways the company is a steward of the environment. This stewardship is a reflection of TECO’s compliance with federal environmental regulations. TECO, partnered with USF, is evaluating the feasibility of future carbon capture and storage (CCS), which would mean pumping carbon emissions underground in Florida. According to the TECO website, in order to comply with new EPA rules to reduce emissions for existing power plants, “a new coal unit would need to be equipped with Carbon Capture and Sequestration technology, which has not been shown to be economically or technically viable” (TECO, 2014).

TECO also owns and operates the Manatee Viewing Center (MVC). Local residents and tourists can view manatees in the canal from observation decks or Tidal Walkway Nature Trail, visit the environmental education building, and park their cars under TECO’s largest array of solar panels in the community. Inside the MVC, children can piece together manatee bones, enter a hurricane simulator, walk through a butterfly garden, learn about aquaponics, and see “how Big Bend Power Station generates electricity for the community in an environmentally responsible way” (TECO, 2013). Energy companies thus resemble right-wing think tanks in their tendency towards denying climate change, though they also take the position that there is no alternative to
fossil fuels if cheap energy is needed for economic progress. In the process, there is also a tendency towards ‘green washing,’ as coal-based companies have to be shown complaint with environmental regulations and good stewards of the environment.

Climate change remains a contentious site of debate in the U.S. The debunking of climate science is the cornerstone of climate change denialism, which makes environmental pronouncements seem ‘alarmist’ in comparison. The extent to which such polarized positions feed into everyday understandings of climate change will be examined in the next chapter.
CHAPTER SIX:

INDIVIDUAL PERSPECTIVES ON CLIMATE CHANGE: INTERVIEW FINDINGS

This chapter shifts the discussion of climate change to the realm of the everyday and discusses findings from interviews conducted with residents of the neighborhood of Tampa Palms. The first section focuses on questions specific to climate change, the second section covers knowledge of electricity production, and the third section delves into broader environmental attitudes. The chapter thus situates knowledge of climate change within a wider set of environmental knowledge, attitudes, and concerns. For each interview question, the response that best illustrates the perspectives of respondents is highlighted as well as the range of responses. The chapter concludes with a summary of the main findings from the interviews.

Knowledge of Climate Change

Questions related to climate change focused on individual knowledge of causes and consequences. Respondents were also asked about their sources of information, whether media sources or personal experiences, and whom they thought should be responsible for addressing the problem of climate change. The attempt throughout was to understand the extent to which the range of responses
reflected the broader polarized discourse on climate change discussed in the previous chapter.

**Defining Climate Change**

Respondents were directly asked about their definition of climate change, and prompted to further specify whether they believed it to be a naturally occurring or human-made process. Respondents answered this question by commenting on whether they believed climate change was occurring or not. Respondents who considered climate change to be occurring cited the evidence of weather fluctuations and the retreat of polar icecaps. One representative example of this position was provided by **Henry** (45 years, some college, Democrat):

> I know [climate change is] happening. It was 80 degrees today in the middle of December; that is ridiculous. Record heat, right? There’s record heat and oceans warming and melting icecaps, even the minute changes in degrees are radically altering biomes across the globe, endangering lots of species.

Respondents who believed that climate change is not occurring also cited weather conditions to support their view, but in their case, such fluctuations were seen as part of natural climate cycles. **Melody** (54 years, Bachelors degree, Republican) put this in especially clear terms:

> I think [climate change is] a bunch of bull. I think climate temperatures are very cyclical and I think, you know, you look at the records, I’m big
into weather, I’m real big into the weather, the wind and the rain, and when it rains and the temperature, so I think it’s very cyclical.

Extent of knowledge about environmental processes and policies played a role in responses. In one case, a respondent seemed to map his own personal experiences of weather events onto the larger issue of climate change. According to Paul (84 years, some college, Republican),

I think [temperature] is going to go up and down like it always has. It’s just like the hurricanes; how many years since we’ve had hurricanes [in Tampa]? We haven’t had one since 2007.

There seemed to be a lack of knowledge about the role played by global environmental policy making in mitigating previous global environmental crises. Michael (68 years, Associates degree), compared climate change to the ozone hole crisis, seemingly without knowledge of how the control of CFCs exemplifies international coordination on environmental regulation:

I don’t think man has anything to do with [climate change]. It’s just like years ago, they used to say that the ozone layer was going away, you don’t hear about the ozone layer anymore. They don’t talk about that because nothing happened to the ozone layer. So, now it’s this new thing, climate change.

Uncertainties in knowledge was a major theme cited by respondents. Thus, climate change could not be clearly defined because of the murkiness of scientific knowledge. Derek (48 years, Masters degree, Independent) pointed out that while
his own experiences suggested that climate change was occurring, information from scientists was not that clear.

   There’s a lot of controversy [about climate change]. I mean who do you believe? There is so much information out there. It is really hard to know the truth from the non-truth. There is definitely climate change; you can feel it. It’s not the same. This is record temperatures for December.

**Hillary** (48 years, Associates degree, Republican) also cited incompleteness of information while supporting the idea that climate change was a cyclical process.

   They [scientists] said all the ice is melted, but now they are not saying how much it’s come back, how many miles of ice have come back again? I think the ice will keep coming back. In another hundred years it may be just the opposite.

**Ivan** (27 years, Bachelors degree, Republican) seemingly combined all possible positions on climate change in his response, while broadly holding to the idea that climate change is occurring. It is possible therefore that the presence of competing viewpoints on climate change does not always result in blanket dismissal or paralyzing confusion.

   We do have an impact on the Earth, but also the Earth goes through its cycles as well. I think it’s about 50/50, more on ours, but it’s both.
The power associated with climate change discourses, especially the power to accumulate prestige and wealth, was noted by some respondents. The role of scientists and politicians was especially singled out.

It’s a crazy idea they [scientists] came up with. You’ve got scientists, always trying to come up with new theories and new ideas, who want to do it for money. Let’s face it you can win big prizes, Nobel prizes and Pulitzer prizes. (Stan, 27 years, Masters degree, Republican)

Al Gore, I think he did it [invented climate change] for financial gain. He’s made a lot of money off of it. And his, what is it? His footprint is one of the biggest footprints around. He has got a huge house, yet he is the one saying we need to cut back on the energy. He flies all around the world on a private jet. (Nancy, 29 years, Bachelors degree, Republican)

Overall, respondents were eager to voice their opinion on the causes of climate change, and many emphasized the extent to which climate change was produced by economic and political power rather than by nature.

Sources of Information

As discussed earlier in Table 4.2, respondents designated a wide range of media as their main source of information, from network TV and cable channels, to newspapers and the radio. While a clear connection did not emerge in the sample between political affiliation and main source of information, respondents recognized
the extent to which the debate on climate change is highly polarized. As one respondent noted:

We watch Fox News all the time and I listen to the radio a lot. I always listen to AM talk shows and you get both sides that come on and talk and I think it’s split, 50/50. You’ve got very liberal ones and very conservative ones, totally different opinions. The conservative ones are always saying, “No, there is no such thing as global warming” whereas the liberals [say the opposite] ... [I do believe] this last cold spell that we had busted open the notion of global warming as bullshit. (Melody, 54 years, Bachelors degree, Republican)

Given the focus of this study on everyday contexts of knowledge production, it is interesting to note that one respondent, Kendra (44 years, some college, Republican), alluded to another aspect of everyday life that affects ability to gain knowledge via a variety of media sources: lack of time due to hectic work schedules.

When I come home, I’m busy, so I listen. I have TVs on in every room. I’m not a big newspaper person. I just don’t have time. I’m at work from 7.30 in the morning to 5.30 at night.

The issue therefore is not just political understanding, but possibly a paucity of forums within which such political understanding can be constructed and transformed.
Linking Experiences of Weather Events to Climate Change

This question sought to ascertain the ways in which weather events were cited to support or reject the occurrence of climate change. Respondents attempted to associate their experiential knowledge of weather with climate change. For example, Patricia (48 years, Masters degree, Democrat) remarked,

It [the occurrence of climate change] is not a question; there have been changes. More 100-degree-days than usual. I remember hot days when I was a girl, but it used to be cold in November [and it no longer is].

In contrast, Greta (56 years, Bachelors degree, Republican) found that her denial of the climate science matched with her knowledge of Florida’s weather patterns in her lifetime.

Global warming, no I don’t think so. I remember being a kid and we had Christmas dinner out on the porch and we were wearing shorts. But then in 1976 it snowed in Tampa.

While weather patterns over the span of an individual’s lifetime are not a reliable source of knowledge about climate change, such examples were brought up by respondents, suggesting another limitation associated with popular discussions of climate change. Memories of weather or climatic trends in the past among the participants were vague and only captured certain weather patterns, which coincided with memorable events in the lives of the respondents. In fact, misconceptions about climatic patterns in general emerged in one response.
I was told this a long time ago and I have always believed it: The way Tampa sits and the way the winds swirl that is why we don’t get hit directly by a lot of hurricanes. Shifts them away. We rarely get a direct hit. (Gail, 28 years, some college, Republican)

Everyday experience or anecdotal information about weather is thus often linked to climate change in ways that are possibly counterproductive to an understanding of the phenomenon. This was the case of both supporters and deniers of climate change.

**Climate Change as Spatially and Temporally Distant**

Respondents mentioned their anxiety for future generations due to their belief that climate change will happen many years from now (50-100 years). Among those that acknowledge the existence of anthropogenic climate change, the responses indicated that they generally felt the impacts were spatially and temporally outside of their local context and lifespan respectively. Melting of polar ice caps, sea level rise, and hurricanes seemed to be things that would happen elsewhere in the world, or if these changes indeed occurred in Florida, they would occur slowly over long periods of time. Individuals and governments would have time to adapt, relocate, or rebuild in the face of a changing environment. As one respondent put it:

The earth has been around for billions of years. So all of a sudden is it going to disappear overnight or in a few years? (Derek, 48 years, Masters degree, Independent)
The Malthusian narrative of overpopulation and resource limitations was also part of responses. This type of argument may also allow people to reduce the tensions they may have about climate change by diffusing blame across all the people of the world. According to Ingrid (25 years, Bachelors degree, Democrat):

I think Earth is definitely over populated. If they don’t find a way to put people on the moon or something, it’s exponentially going up; the more people you have the more people you are going to make.

To hold population growth responsible for climate change also becomes a way in which patterns of consumption fade from view.

Respondents considered the environment to have improved over their lifetime, which was another way in which environmental pollution, and consequent climate change, seemed less of a problem in the present.

I lived in Pittsburg during the sixties. One summer we couldn’t see downtown the smog was so bad. There were times during summers we didn’t have central air, you had a choice of sweltering heat or opening the windows and being choked by sulfur dioxide. It was bad. (Alfred, 63 years, Ph.D., Democrat)

Other respondents pointed out that the state of the environment was much better in the U.S. than in other countries, so that international experiences also led to fewer concerns about the U.S. environment. Favorably comparing the U.S. to other countries that did not have as strict environmental regulations, Greta (56 years, Bachelors degree, Republican) stated that,
They [the U.S. government] have done a lot [regulations] over the years, like catalytic converters on cars. If they could continue studies and regulate the amount of emissions of these power companies, in this country we have white-burning smoke and in other countries you have black smoke.

In a similar vein, Melody (54 years, Bachelors degree, Republican), mentioned that,

I used to travel for my old job. I was an engineer and I used to travel to Central America, Mexico, Dominican Republic. When you work in those countries they are filthy, filthy, and it makes feel, when you go home you appreciate how clean this country is. So, I try to make it cleaner and don’t throw things out the window because it reminds me of being in those nasty countries. (Melody, 54 years, Bachelors degree, Republican)

One respondent, however, was able to build global connections in terms of environmental quality. Thus, Fred (45 years, some college, Democrat) connected the lack of environmental regulation abroad to U.S. consumption.

We have been to China and the smog was trouble. But on the other hand, they are doing that because of the demand we are creating. How many wide-screen TVs does one need? Those use very toxic heavy metals. Supply and demand.

Despite Fred’s viewpoints, it seems valid to conclude that as long as the immediate air and water remained clean, the presence of and threats associated with climate
change cannot be personally experienced and thus are rendered distant. Views of scientists and environmentalists then become the only means to access knowledge of climate change.

**Addressing Climate Change**

Respondents were asked who should be held responsible for addressing climate change. On the whole, respondents seemed to hold a general distrust of corporations, felt environmental regulations at the federal level were important, had very little faith in other people, and a sense of limited personal agency. **Alfred** (63 years, Ph.D., Democrat) alluded to the role of corporations and the social inequalities that characterize experiences of climate change.

Corporate greed is the root of all evil. Some people will benefit from climate change. I think the people that will be hurt the most by it will be the people that are always hurt the most, the people without resources. Bangladesh and population centers in Malaysia, and some islands out there that are 2 feet above water. They got to swim for it.

Other respondents cast doubt on the ability of corporations to protect the environment, noting their tendency to ‘green wash.’

**BP’s, Beyond Petroleum [campaign], is complete bullshit. Things are pitched as “green” that will sell to a particular section of people. (Laura, 26 years, Masters degree, Democrat)**
Respondents believed that the government, especially the Environmental Protection Agency (EPA) should remain a watchdog of corporations and limit the ability of “dirty industries” to pollute, at least in the U.S.

I think we should keep the EPA; just like everything else, you got to put restraints on stuff. Everybody gets carried away. Corporations would pollute the most because it would be so much cheaper for them. For individuals, it’s not going to cost you that much more or less to recycle or buy a cheaper car and that’s a minor impact, but you’ve got huge corporations disposing of chemicals, they would be the worst. (Melody, 54 years, Bachelors degree, Republican)

Worth noting here is that respondents, irrespective of political leanings, were willing to support environmental regulations. Regulations to protect water, air, and food were deemed necessary for a clean and healthy country.

Respondents expressed disappointment with the current polarization in both public opinion and political pronouncements. For them, as long as the climate debate remained politically divided, there would be no action at the federal level to limit carbon emissions. As Opal (54 years, Masters degree, Independent) mentioned,

It [climate change] has become political. You have to deny climate change, like you have to deny women the right to an abortion and you have to deny people health care. Somehow climate change has been roped into a liberal political agenda like a lot of things that impact everyone and [it] shouldn’t be political.
Jolie (40 years, Bachelors degree, Democrat) expressed the futility of seeking a solution for climate change without broad political support.

Unless you could get a bipartisan coalition to go to Congress and say climate change is happening, and even then there’s even people in Congress that don’t believe in climate change, I don’t think our current Congress could ever pass something to fix it.

One respondent adopted a fatalistic tone that can be considered a response to how knowledge about climate change has failed to be broadly disseminated.

I try not to think about it. I don’t think there is anything we can do. I don’t understand why people don’t believe in climate change. Nothing will change their minds, and unless we can generate a sea change in people’s belief systems to make people think it’s a problem that merits action, I don’t think any action will be taken. In which case we will be underwater, and that is too depressing to think about. I like Florida. (Francis, 26 years, Bachelors degree, Democrat)

When asked about the role of environmentalists and climate scientists, respondents expressed their misgivings. As Hillary (48 years, Associates degree, Republican) mentioned,

This may seem like a peculiar answer. I would trust a meteorologist more in general, than a climate scientist [but] … depending on his political affiliation … because if he was extremely liberal I wouldn’t trust him, because he’d believe in the Al Gore climate change routine.
Elise (25 years, Bachelors degree, Democrat) linked scientific understandings to the legislative process.

I think scientists do a great job. I think the problem is with the lawmakers, but the scientists are not well respected. The legislation is not based on evidence; it’s based on economics, money and personal views, beliefs, and religion.

Elaine and Lamar emphasized the need to improve communication between scientists and the wider public.

I don’t think they [scientists] have done a bad job. I just don’t think they have a marketable language that everyone understands. If you have an advanced degree, you are going to understand what they are talking about and you are going to read about it in the New York Times and the Wall Street Journal and you are going to say, “I see this happening.” (Elaine, 57 years, PhD, Democrat)

Their [scientists] messaging is not reaching the masses. So people are ignoring it. I don’t think people are ignoring it because they want to ignore it. They are ignoring it because understanding the ramifications of global warming is difficult. (Lamar, 29 years, Bachelors degree, Democrat)

Respondents also mentioned changes in personal consumption habits as an effective solution to climate change. This may be due to the fact that respondents felt that as long as climate change remained a politically contentious issue, nothing would be done on a large-scale to limit the pollution practices of the fossil fuel industry. One respondent discussed personal responsibility as follows.
At the end of the day, I believe it’s the individual. You have a brain; use it. It helps hearing it from other people. It’s like someone else is doing the research on your behalf, and ultimately I have a responsibility as well to know and make a decision. **Sasha** (29 years, Associates degree, Democrat)

**Elaine** (57 years, PhD, Democrat) mentioned the value of environmental education.

I think people are just being ignorant. It hasn’t affected them personally. Unless you start educating. If you start young. It’s just like the recycling unit. When I was a kid, nobody recycled and there were commercials with the sad Indian and the tear running down his cheeks, and he’s sitting by the side of the road. We started educating in the mid-1970s with the little kids “Pick that up,” and now it’s like a right of cause. Now, you just recycle. You don’t see stuff in the neighborhood; if you do, you pick it up. You don’t think about it. Even in downtown Tampa, you don’t see streets covered with stuff. And that is because from the time kids are in Pre-K they are taught: “Pick it up.” Recycling goes here, garbage goes there.

Other solutions mentioned by respondents included using economic incentives so that individuals and corporations would embrace more sustainable practices, as regulating corporations would only cause industries to increase costs for consumers.

One representative view was expressed by **Carl** (67 years, Ph.D., Democrat):
I think it would be something hard to mandate, but if it were something where they offered tax rebates, more people would do it. If the government said this is something we’ll give you credit for, people would do it. I don’t think TECO is ever going to give you credit for it because they are earning money, but I think if our government said we’ve given you health care, now we are going to work on our environment, more people would join the bandwagon. Maybe, I would.

Jacob (45 years, some college, Independent) mentioned the role of peer pressure.

I’m not going to sit down with my blinders on and make a decision, no.

I’m going to be influenced by the people around me. So, you know, if my neighbors start buying [energy efficient automobiles such as] Priuses and things like that, then maybe I will need to do that too.

Overall, respondents articulated a range of solutions for climate change. It seems that though knowledge of the issue itself may be limited due to lack of information and identification of climate change with specific political leanings, a conversation on environmental alternatives exists among the respondents.

Knowledge of Electricity Production and Consumption

To examine whether respondents linked the occurrence of climate change to their own lifestyle, a number of interview questions focused on electric supply. Since electricity supplied to the case study neighborhood is produced through the burning of coal, electricity production and consumption provides a useful way in which to understand how climate change can be connected to everyday contexts. The
previous section briefly discussed how climate change is rendered spatially and temporally distant. This section seeks to examine how even intimate forms of environmental behavior, such as electricity consumption, can remain outside the realm of everyday consciousness.

Sources of Electricity

Respondents were directly asked about where and how the electricity they utilized was generated, and could not provide a correct answer for this. It would be fair to conclude therefore that while electricity consumption was an integral part of their lifestyles, this consumption was also sectioned off and disconnected from the material realities of resource extraction, transportation, production, and waste generation. Responses seemed to verify the fetishized consumption of natural resources, electricity being further fetishized because of its invisibility with power lines running underground and secreted behind walls. Two representative responses regarding the invisible nature of electricity were as follows:

It’s part of the infrastructure. You don’t even notice it. It’s like the internet. I don’t understand that either. It’s buried too. (Elaine, 57 years, Ph.D., Democrat)

The nice thing about this subdivision is that all the lines are not noticeable; it’s all underground here. It’s like it’s magic, or pretty close to it. (Paul, 80 years, some college, Republican)
A specific question was then asked about whether the electric supply to the neighborhood was generated through the burning of coal. Respondents however were not sure if this was the case. As one respondent mentioned,

I know it comes from TECO energy. My house is all electric, and I know TECO has coal-burning plants, but I know they have converted their plants over to natural gas, now. (Uma, 30 years, Bachelors degree, Republican)

Another respondent (Jolie, 40 years, Bachelors degree, Democrat) mentioned that the energy company that supplied their neighborhood had moved away from coal, and yet another respondent was certain that the source of electricity was natural gas (Nancy, 29 years, Bachelors degree, Republican). One respondent mentioned that he could not be sure whether the source was coal or not.

I know they have coal-fired plants around here. But, exactly where it comes from I don’t know. (Paul, 80 years, some college, Republican)

One way to interpret the incorrect notion that coal was not utilized by the electric company is to understand it as a means to placate personal anxieties related to electricity consumption and its possible connections to environmental pollution. It also indicates the extent to which knowledge about electric supply is not provided to electricity consumers. Ignorance therefore becomes an aspect of living in a suburban home. In the context of the interview, lack of knowledge also prevented a longer and more detailed discussion about how nature is transformed for suburban consumption, limits to consumption of natural resources, and negative consequences of the use of fossils fuels.
Concerns about Consumption

Based upon responses to questions about electricity generation, it seemed that respondents had not spent much time reflecting on the production of electricity. However, consumption did become a matter of concern, but mostly when it came time to pay the bills. As one respondent put it,

Bills, that’s the first thing I think about [when asked about electric supply].

(Carl, 67 years, Ph.D., Democrat)

Cost therefore was one way in which electricity consumption intruded into everyday consciousness. As Elaine (25 years, Bachelors degree, Democrat) mentioned,

Electricity is definitely an issue for me, the price of it. Every time you turn up the air conditioning, the bill goes up. And living on the second floor is very hot. You can tell if someone leaves the light on for a long period.

Respondents compared the cost of electricity in Tampa with their experiences of living elsewhere.

I feel that the electricity is very expensive here in Florida. We used to live in Boston and it was much cheaper. I think back then we spent $35 a month.

(Opal, 54 years, Masters degree, Independent)

I haven’t had an issue with the cost. I find it much cheaper here than in Washington D.C. (Elaine, 57 years, Ph.D., Democrat)

Yet, as one respondent mentioned, there was no alternative to paying for electricity.
It’s sort of a fact of life. It is what it is, you know. If they raise the price ten percent what am I going to do, you know. I’ll rub two sticks together. (Oliver, 68 years, Bachelors degree, Democrat)

The electricity bill was also the context in which they became familiar with the name of the company that supplied them with power. They would not be able to identify the Tampa Electric Company (TECO) as their supplier if it were not for the bill.

However, even the electricity bill became a distant entity sometimes. For married couples, only the person who paid the bill was often familiar with it. Lack of engagement with their consumption of and expenditure on electricity was also noted by respondents who used an automatic bill-pay system provided by TECO, which deducts monthly payments directly from their bank accounts, such as in the case of the two respondents below.

I’ve been getting direct payment for seven years now. I just see how much they are taking out of my paycheck. They send me an email and tell me it going to come out on the 6th of the month or whatever. I don’t actually pay attention to the email. (Greta, 56 years, Bachelors degree, Republican)

We pay our bill direct deposit. And I don’t actually get, unless I go online to see it, a breakdown of that bill. So, as far as I know, it’s a number that gets drafted from my account in the middle of the month. And that number bounces around. And if it got too big I’d say what the hell is going on, say in the $500-600 range. It’s usually above $250, but less than $400. (Oliver, 68 years, Bachelors degree, Democrat)
Since concerns about consumption were mainly raised in economic terms (the electricity bill), it would seem that respondents did not dwell on the environmental impacts of their consumption. However, as will be discussed later, respondents were also concerned about energy conservation when directly asked about this aspect of their consumption.

**Experiences of Loss of Electricity**

When relating stories about times when power was interrupted by electrical storms or hurricanes, respondents expressed a certain awareness of their power consumption and their dependency upon it. Recounting times when they experienced disconnection from the grid, concerns about electricity consumption began to move to issues of safety, comfort, normalcy, and even luck. Raine and Quinn discussed events when power was lost.

- It happens when we have normal thunderstorms too. It’s not just hurricanes. And we’ve also had the power go out because we had these neighbors that would run into our transformer and the power would go out all over the house, sometimes for as much as a whole day. *(Raine, 25 years, Masters degree, Democrat)*
- During a hurricane, power went out for probably three days was the longest. We lost our refrigerator for one of them. It was out for long enough that my refrigerator blew itself out and I had to get a new one. *(Quinn, 44 years, some college, Independent)*
Respondents discussed hardships associated with loss of power.

The hardest thing is if you have perishable food in the house. So the problem is you cannot open the fridge or the freezer because it lets the cold out. Then you have to throw everything away. Even the toilets don’t work if you flush them too many times. (Ingrid, 25 years, Bachelors degree, Democrat)

I remember when a hurricane came through and knocked out power. I went down to get ice at one of the places and the lines were a block long. People were buying ice at the front of the line and then tripling the price and selling it to people at the end of the line. It took some nerve to do that. It was an interesting experience. (Alfred, 63 years, Ph.D., Democrat)

In contrast to such anxiety, Bethany expressed a sense of excitement connected to major storms or power outages.

I had fun when we lost power. I started looking for flashlights and candles. (72 years, Masters degree, Democrat)

For her, the impacts of climate change over the next few decades, such as major hurricanes or sea-level rise, would be an interesting and exciting time to live through.

Respondents were also asked to consider the impacts on their lives if future climatic events disrupted power for extended periods of time. But power disruptions seemed to be conceptualized as rare occurrences, which could be dealt with as the events transpired, not as something that would last very long and definitely not a permanent problem.
If we had lost our power here for a month, we would be in trouble because the house would get moldy. You need the air conditioning to dehumidify the air inside. I know I would leave. I own two other homes, so I would either go to Durham or Washington, DC, and stay in one of my other homes. (Elaine, 57 years, Ph.D., Democrat)

Other respondents related stories of friends that had experienced the impacts and aftermath of Hurricane Katrina, as something they would not want to experience personally, but something they would deal with if and when it occurred. Respondents expressed the idea that luck was on their side because they had never lived through any major storm, and in their estimation, would never live through any type of major climatic event that would impact them in any significant way.

Some respondents were first generation immigrants or had experienced living outside the U.S., and alluded to their ability to deal with power outages as they had dealt with them in other countries. But they also mentioned that while power outages may be commonplace in other countries, they would be rare and unwelcome in the U.S.

You know, we come from Lebanon. We are used to no electricity, no water for a long period of time. We are used to that. ... Yeah, for the hurricane, sure I know I have the backup, because water is more important to me than electricity itself. (Dana, 47 years, Masters degree, Independent)

When I lived in India, the power went off every day for several hours. Brownouts came into the suburban centers as well as the rural areas. The
expectation is that the power goes out for several hours a day, usually during the hottest part of the day because that is when the power consumption is highest. The strangest thing was I was at my host parent’s house in a major city and we still had brownouts come through because the energy consumption is high. (Elise, 25 years, Bachelors degree, Democrat)

Loss of electricity thus was one context in which the hardships associated with disruptions due to climatic events could be gauged. But such loss was also viewed as an aberration, or at most an event with which the respondents would be able to cope. The extent to which the regularity of electric supply is taken for granted thus becomes yet another way in which the environmental bases of suburban lifestyles remains hidden from view.

**Making Electricity Environmentally-Friendly**

Respondents were asked whether they had adopted any electricity conservation practices or considered alternative forms of energy generation, especially solar energy. Respondents talked about the ways in which they attempted to reduce electricity consumption in their home by simply turning off lights and air conditioning when it was not being used.

I walk around and turn off unnecessary lights. I don’t see the point [of having them on]. (Derek, 48 years, Masters degree, Independent)

We had a sign in our old house by the garage door: ‘Turn the AC Down!’ The last person leaving the house put the AC on at 80 degrees before they left. We
were wasting energy and money [otherwise]. Because none of us is at home
during the day, 8 or 9 hours, it’s a waste. (Carolyn, 52 years, PhD, Democrat)
The aim of such conservation however was to reduce electricity bills, not necessarily
to reduce impacts on the environment. As Benjamin’s response suggests, the value of
conservation practices is related to their effects on energy costs.

Out here has been insulated [his back porch]. The windows are double paned
and all the wood is insulated, so we didn’t have to get another AC unit for
here. We don’t really see the difference in the bills. (Benjamin, 79 years,
Bachelors degree, Democrat)

Respondents were aware of opportunities provided by the power company to
measure and reduce electricity consumption. Some mentioned TECO’s energy audit
programs that enabled one to understand how electricity wastage could be tackled.
Others were interested in a program TECO offered that forces a “brownout”
(shutdown in electric supply) to control energy consumption. However, no one who
mentioned this program had actually signed up for it because the times when the
power would be shut off were not clear.

They have a program at TECO that forces a brownout each day or every other
day. But I never signed up for it because I always had kids in the house. I
always thought that would be a little unsafe. But they didn’t guarantee that it
was in the middle of the night. It might be at noon or when they are coming
home from school. I never signed up because of that. (Richard, 44 years,
Masters degree, Independent)
When asked if they would prefer that TECO continue to use coal or move way from coal to other energy sources, respondents indicated that burning coal was less than ideal and that they would prefer that their electricity were generated by burning natural gas.

Coal is a very dirty-burning fuel, you know. So I would prefer it [electricity generation] to be based on natural gas. (Greta, 56 years, Bachelors degree, Republican)

Probably natural gas because I think that is cleaner. That’s my impression. You have less problems with sulfur dioxides, sulfur emissions, carbon emissions. (Tonya, 49 years, Bachelors degree, Democrat)

I do know that natural gas is a more efficient burning fuel than coal. (Uma, 30 years, Bachelors degree, Republican)

One respondent mentioned the labor associated with gaining access to coal as a matter of concern.

It takes a lot of work to mine coal, and I think of all the people that have to mine coal. (Dana, 47 years, Masters degree, Independent)

Respondents were not asked whether they considered natural gas also to be problematic in terms of the ecological costs of drilling. It seems likely that a concerted media campaign that has presented natural gas as a clean burning fuel led respondents to mention it as a preferable alternative.

The possibility of utilizing solar energy was brought up during the interviews but none of the respondents had much knowledge about the feasibility of adopting
this. For instance, **Benjamin** (79 years, Bachelors degree, Democrat) offered up more questions than answers about solar energy.

> I don’t know a lot about it [solar]. Does it need to be maintained? Do you have to replace them every few years? How long does it last?

**Greta** (56 years, Bachelors degree, Republican) thought the homeowners association would block the installation of solar panels or at least make it a difficult and time-consuming endeavor.

> I don’t know if our homeowners association would [allow it]. They probably have standards on that. They made me get a new mailbox. They sent me notices in the past to make sure my roof was free of mildew. I don’t know if we have complete control.

Respondents were not clear about the costs associated with installing solar panels.

> I haven’t considered it [solar panels], because it’s a big expense up front. I would estimate $50,000. I don’t know that for a fact. (**Opal**, 54 years, Masters degree, Independent)

> Financially, now, I would say no. Also I’m renting so I would not consider doing that [adding solar panels] to a rental property anyway. (**Uma**, 30 years, Bachelors degree, Republican)

In contrast to such speculations, two respondents had an actual experience to relate regarding solar panel installation. **Patricia** (48 years, Masters degree, Democrat) spoke about her experience with using solar energy.
At one time we had solar panels for heating the pool. They never worked very well and so we just took them off. We have gas in the house, so we have a tankless water heater. We have a gas stove. Only one in the subdivision as far as we know. We have gas for a hot tub out here. I thought the gas would be more efficient and would cut costs.

Alice (48 years, Ph.D., no affiliation) had wanted to purchase solar panels when she bought her home, but was unable to do so due to restrictions in the community. Her roof was deemed too steep for the solar panels to meet hurricane safety standards.

My roof was not graded so I could get solar power. It was too steep. When we purchased the home, we did look into that. They said they couldn’t do that [install solar panels] because of the pitch of the roof. You can only have it at a certain pitch. The sun hit it fine, but with respect to being compliant with the hurricane standards, it wasn’t something we could do. But I would totally be into solar power. In this community it makes total sense, but we don’t have anybody that supports it so we don’t use it. … The roof was going to be $28,000 with the solar panels. I would have paid it. I think in the long run, if you own a home you will pay it off. It would make sense, but you don’t see very many Florida homes with it.

Personal experiences with photovoltaic technology (e.g. solar-powered walkway lights, solar water heaters for heating pools) had created the impression that all photovoltaic applications (including rooftop solar panels) were highly inefficient and costly, therefore a waste of effort, time, and money. The impression was that
alternatives in general could not match the power and reliability of electricity provided by power companies.

Respondents were of the opinion that if solar energy were used to generate one’s own electricity then any excess produced could be sold back to the electric company, even as they were not certain about this.

I don’t know how well it works actually. I think you can actually generate more power and feed it back to the power company, if your meter starts going backward. (Derek, 48 years, Masters degree, Independent)

I do know that if you produce your own electricity, if you have solar power, if you have more than you need, you can sell it to TECO and they give you rebates. (Fred, 45 years, some college, Democrat)

I heard of several studies and cases where people have actually done that [sold electricity back to TECO]. They are making money because they are selling back to the power company. (Melody, 54 years, Bachelors degree, Republican)

The discussion of solar energy thus also took on a financial tone, in terms of both costs of installation and possibility of earning money from it, rather than being focused on environmental benefits.

Reflecting more broadly on alternative energy technologies, respondents pointed out that these may be as harmful to the planet as conventional technologies (even as this insight was not voiced in the context of natural gas). For instance,
Michael (68 years, Associates degree, Republican) expressed his misgivings about electric cars.

You get such great gas mileage and you reduce your dependence on oil, but here you are burning coal. I don’t get that. That should be counted into the equation. Yeah, the car is less polluting, but the plant you are getting electricity from is more polluting than your average car. As far as I can tell, they haven’t really figured out where they can get the cost down to a reasonable price and work efficiently and hold a charge long enough to be really viable. Getting better, but it’s still not efficient enough.

The relative paucity of non-fossil fuel technologies seems to be working against any serious contemplation of alternative energy options.

Respondents were also asked if they felt that they could make changes in existing structures of electricity generation. Respondents indicated their belief that present modes of generating electricity could not be changed in substantial ways. They felt they were obligated to purchase power from TECO and were unable to change, or even question, the way in which the power was produced. As Sasha (29 years, Associates degree, Democrat) put it,

I think this [TECO] is where you get it. Take it or leave it. (Sasha, 29 years, Associates degree, Democrat)

Environmental problems were understood as too large, complex, or widely distributed for individual efforts at the local level to be meaningful. Respondents found most of the agency to be situated with corporations, but they were also
hopeful about the collective agency of people. Thus, if everyone acted in unison to eliminate corporate pollution or pressured politicians to impose environmental regulation, then pollution could be addressed. Elise’s views expressed this position.

I don’t think I could change what TECO is doing. [But] I think if enough people, like a neighborhood watch, if you get enough people together, then the awareness is raised and then TECO hears. Because if one customer badgers them, they are a “crazy customer,” but if thousand customers are talking about it, they have to think about it. (Elise, 25 years, Bachelors degree, Democrat)

In contrast, Oliver emphasized that he would protest environmental degradation even if it were only he doing the protesting.

I would have a say, that’s the kind of person I am. I don’t know how much influence I would have, but I would certainly contest it if I thought it was going to be detrimental to this community. (Oliver, 68 years, Bachelors degree, Democrat)

While lacking information on the sources of their electricity and generally aware of the limitations imposed on them by their own consumption needs, respondents were aware of the need for environment-friendly energy sources and seemed willing to raise the issue of adopting these within their own community. But the lack of existing models of alternative energy use seemed to work against such environmental attitudes, thus perpetuating the status quo. The acts of energy consumption are disconnected from the source of that consumption (e.g., coal-fired
power plants), therefore the respondents’ knowledge of climate change was also uncoupled from personal consumption in general.

Overall, the source of electricity is hidden in many different ways allowing habitualized practices to continue without being coupled to the negative environmental consequences of these practices. It can be concluded that with no daily contact with the sources of their consumption, knowledge of these sources and the pollution they release into the atmosphere from their conceptual universe. As electricity generation has become deeply fetishized by consumers (i.e., power bills paid automatically), the sources, the processes, the pollution, and social relations that created the electricity remain hidden.

Attitudes Towards Environmentalism

This section seeks to provide a means to compare the previous discussion of climate change and consumption with broader environmental attitudes. Respondents were asked about their own environmental activities, whether at the individual level or within activist groups. This also provided an opportunity to reflect on the ways in which environmental changes could be effected or was obstructed within the U.S.

Self-identification as ‘Environmentalist’

Respondents considered themselves environmentally conscious and wanted to protect nature for future generations. As Jacob and Benjamin put it,
I’m aware of the environmental movement. I’m aware of green things and green practices. (Jacob, 45 years, some college, Independent)

I have always been conscious about the environment because we live in this [polluted] environment; for example, [automobile] exhaust pipes have an impact on health. (Benjamin, 79 years, Bachelors degree, Democrat)

Greta mentioned a close connection to nature.

I love nature, I get up in the morning and I hear the birds sing, I’m always thinking about nature. (Greta, 56 years, Bachelors degree, Republican)

The term “environmentalist” was rejected as respondents related environmental activism with extremism. Jolie (40 years, Bachelors degree, Democrat) expressed this position as follows:

No, I would not call myself an environmentalist. I’m not extreme, but I’m aware of our environment and I don’t do anything knowingly to hurt it. [For example,] I would hate to see someone dump something in the [neighborhood] lake.

To borrow a term from Carl (67 years, Ph.D., Democrat), such attitudes could be considered ‘borderline’ environmentalism. In terms of actual environmental actions, ‘borderline’ environmentalism seemed to translate into participation in individual environmental behaviors rather than large-scale environmental activism.
Individual Acts of Environmental Conservation

Respondents seemed actively involved in what can be considered everyday acts of conservation that were within their control. Jacob designated these as Small ways in which you can do things, [such as] going to Publix with your reusable shopping bags. I do that one out of three times. (45 years, some college, Independent)

Others mentioned similar ‘small’ acts.

We compost vegetables and all the food leftovers we compost. (Noel, 34 years, Bachelors degree, Republican)

I try in even single aspect possible to lower my impact. I try not to drive far and buy local produce. I don’t buy anything in wrappers. Mostly bulk food. I compost all of my food. I recycle everything. So my garbage each week is about a handful or less than that. (Yolanda, 25 years, Bachelors degree, Democrat)

Nancy (29 years, Bachelors degree, Republican) mentioned her acts of conservation at her workplace.

I think about the trees and try not to use too much paper, because my job requires a lot of paper. If I can avoid printing things, I do electronic signatures so I don’t have to print contracts.

An especially popular environmental conservation activity, and one that did not have a political charge connected to it, was recycling. Recycling was an activity that was within their control and convenient, not requiring large expenditures of money
or time. Respondents seemed to feel good about doing something to balance the polluting tendencies of their lifestyles, possibly fulfilling their desire to live in a more sustainable way. Respondents spoke with pride, about the new recycling bins recently supplied by Hillsborough County.

I love the new [garbage and recycling] bins [provided by the waste management company] because I can fit a lot in them. We have more recycling than garbage. We recycle everything almost. (Dana, 47 years, Masters degree, Independent)

The costs of environmental conservation were a matter of concern. As Kendra (44 years, some college, Republican) put it, “You have to weigh your options between cost and convenience.” Some respondents were concerned about companies passing on the costs of environmental conservation to consumers. According to Melody (54 years, Bachelors degree, Republican),

If you could regulate that sort of stuff so that there are controls on the amount of pollution companies can emit, but then that makes everything more costly. I don’t see consumers saying they are going stop buying until they [corporations] stop polluting.

While respondents engaged in personal acts of conservation, they were also aware of its limitations. Carolyn (52 years, PhD, Democrat) likened such individual acts to “a grain of sand in the whole scheme of things.” Similarly, Francis (26 years, Bachelors degree, Democrat) stated that,
I think it [environmental conservation] is a combination of corporations and government. I don’t think individuals have much impact.

Elaine emphasized the value of individual actions while also alluding to the broader context of environmental use.

When individuals made a decision to stop polluting [Tampa] bay, the corporations had to stop. Now is a more functional bay and the birds and fish have come back. (Elaine, 57 years, Ph.D., Democrat)

Overall, respondents sought to control their environmental impacts on a daily basis, and though such activities are possibly marginal in the larger scheme of things, these also point to the presence of an incipient environmentalism.

Contradictions of Suburban Lifestyles

Respondents understood their own lifestyles as being rife with contradictions, beginning with their living in suburban neighborhoods, their use of automobiles and the larger culture of overconsumption in the U.S. The neighborhood focused on in this study, Tampa Palms, appears to be environmentally idyllic, with large oak trees along broad winding streets, but respondents felt that their surroundings, the air and water, were tainted by pollution and not as clean and healthy as they should be. As the interviews continued, a sense of culpability for this pollution emerged in various responses. Hillary (48 years, Associates degree, Republican) expressed concern about the effects of her surroundings on her health.
I live very close to the interstate and I’m sure there is carbon monoxide floating over my house. You hear the cars whizzing by 24/7. You are breathing all that carbon monoxide, and when I have the windows open, what’s it doing: coming in the house. I don’t physically smell it, but that doesn’t mean it’s not there. I worry about the health issues. (Hillary, 48 years, Associates degree, Republican)

Opal (54 years, Masters degree, Independent) mentioned the juxtaposition of natural and human-made elements.

We have a 6-lane highway right out the door and then you got the alligators. There is a bit of disjuncture. But I think having all of these preserves and conservation areas seems to me to be a smart idea. Better than be jam-packed together in some tenement in NY [New York city].

Raine (25 years, Masters degree, Democrat) pointed out that suburban natural environments had been destroyed by human residents.

I think about the alligators...we are the ones that invaded their home. I saw one the other morning and the alligator had more sense than me and just went back into the water. It’s not their fault at we are out here.

Bethany (72 years, Masters degree, Democrat) detailed her efforts to clean up the neighborhood, suggesting a close connection to her local environment.

When there was trash left across the street, I tried to deal with our homeowners association. They want your money. Finally I called the Mayor. I
just hated to see that there. I called the Mayor on a Tuesday and it was removed that week.

Respondents were also quick to note their own contributions to environmental degradation, especially in terms of their dependence on automobiles. They thus pointed out the contradiction between their desire for a clean neighborhood and their everyday acts of pollution. The response provided by Stan (27 years, Masters degree, Republican) exemplifies such contradictions.

I like the big trucks and stuff like that, but when it comes to composting and watching what you throw away, yes [I do that too]. ... In terms of energy, no, but garbage and recycling, yes. I love those new recycling bins.

Respondents pointed out the exigencies within which they chose to drive particular automobiles or their desire to make changes in the future.

I’ve had the same car for a long time now. 12 years. An SUV [sports utility vehicle]. At the time I needed a large car. My girls were in school and paying softball and I was driving them all over the place. (Hillary, 48 years, Associates degree, Republican)

My husband has an F-350 [large pickup truck], but it’s a diesel. He got that because it is supposed to get better gas mileage. At the time, diesel was cheaper than gas and now it’s not. (Uma, 30 years, Bachelors degree, Republican)
If I bought a new car I would get something more economical to drive.

(Nancy, 29 years, Bachelors degree, Republican)

Thinking in terms of the broader national context, respondents recognized that their ability to practice environmental conservation was hampered by rampant consumerism and individualism. In Ivan’s estimation,

I think America is not set up for proper community usage. I think Americans are required to drive a vehicle, to become independent you need to have a vehicle; you cannot rely on the public transportation. (Ivan, 27 years, Bachelors degree, Republican)

Oliver voiced concerns about the wastage associated with consumerism.

The U.S. is a “throw-away” place and no matter how much you try there is only so much you can do. (Oliver, 68 years, Bachelors degree, Democrat)

This suggests pessimism with respect to prospects for changes in the consumptive behaviors of Americans and of success with large-scale sustainability efforts in the U.S. It is within this larger framework of pessimism that lack of active engagement with issues such as climate change can likewise be situated.

Discussion of Overall Findings

Interview respondents were divided in terms of their understanding of climate change, but exhibited similarities in terms of broader environmental issues and attitudes. It can be argued that it is these areas of broader agreement that can be utilized to align scientific and public perceptions of climate change. This concluding
section provides five main findings in terms of suburban experiences of and attitudes towards climate change gleaned from this study.

(1) Negative impacts associated with climate change, such as melting polar ice caps or hurricanes, are conceptualized as spatially and temporally distance phenomena. Respondents, whether they accepted anthropogenic climate change or not, described these potential negative events as sporadic episodes that would most likely have little or no direct effects on their lives. Some described hurricanes as something they had lived through in the past and something they could deal with in the future. As a result, the dire predictions of climate scientists as part of the apocalyptic global warming discourse have little effect at the local level.

(2) Spatial barriers act to hide the true qualities and quantities of suburban consumption, as evidenced by knowledge of electricity production, and hence of suburban links to climate change. The interviews revealed that respondents lacked knowledge about the way the electricity they consumed is produced, especially in terms of energy source utilized. At the household scale, material traces of energy consumption are hidden. Most electrical transmission lines are buried underground and the cables within homes are placed behind walls. In effect, the concealment of power generation by distance and structures dissolves consumers’ knowledge and therefore their concerns about the negative environmental impacts of their consumption.

(3) Electricity is associated with comfort and has become an integral part of modern life. Many respondents indicated that the temperature of their home was set in accordance with personal comfort and preference. Some indicated that only when the
cost of electricity seemed too high, or out of the normal monthly range, would become concerned about their personal usage.

(4) Respondents indicated that regulatory policies were vital to maintaining a clean, healthy, and aesthetically pleasing environment in the U.S. However, environmental regulations were connected to economic costs. It was assumed that any new environmental regulations targeting polluting industries would result in higher taxes or energy bills for consumers.

(5) Respondents felt their power to make substantial changes regarding the environment was limited. One the one hand, respondents expressed a broad desire and ability to change their personal consumption habits to lessen their impacts on the natural world (i.e., recycling, composting, programmable thermostats etc.). On the other hand, respondents indicated that they had very little agency when it came to making changes in their own sources of electricity through alternative technologies, and expressed an overall distrust of corporations, which were considered the main source of pollution. The capitalist system was not directly discussed, so that the ‘production of capitalist nature’ remained a covert process underlying everyday life in suburban environments.

The results presented in this chapter underscore the complexity of everyday understandings of climate change, where knowledge gleaned from wider institutional discourses is not merely repeated, but also juxtaposed with experiences of suburban consumption. It may thus be inaccurate to argue that the polarized debate on climate change is replicated by polarized positions on environmentalism per se, at least in the
context of this case study neighborhood. Overall, climate change represents an immensely complex socioecological challenge that requires a multidisciplinary approach, combining an understanding of the natural sciences with an understanding of the social and political pathways through which scientific knowledge has to travel before it can be translated into popular consciousness.
CHAPTER SEVEN:
CONCLUSION

The objective of this doctoral dissertation was to investigate public perceptions of climate change, electricity consumption, and environmentalism and compare these perceptions to pronouncements by the main epistemic agents that attempt to represent climate change in terms of its causes and consequences. In the process, local, everyday frames of climate change were contrasted with national and global scales of debate. Four main research questions directed this study:

(1) What are the prevalent discourses of climate change and to which institutions can these be attached?
(2) How do suburban residents understand climate change?
(3) Electricity being one major link between suburban lifestyles and climate change, how does knowledge of climate change compare with knowledge of electricity production and consumption?
(4) In what ways do institutional discourses of climate change connect to the viewpoints of suburban consumers?

The following sections review findings from the study, focusing on the polarized discourses related to climate change, the role of suburban living in obscuring climate change, and the limitations of the study.
Discourses of Climate Change

By focusing on the scale of the everyday, this study examined how global capitalist imperatives are experienced in the intimacy of homes, as climate change becomes a spatially and temporally distant event despite the daily acts of consumption of coal-based electricity, which contribute to climate change. Even as the problem of climate is amenable to being addressed by regulation or elimination of the fossil fuel industry and protection for ecological sinks, such as rain forests and oceans, as long as discourses of climate denialism, especially those emanating from well-funded think tanks, dominate public consciousness, they will continue to confuse, obfuscate, and frustrate understandings of climate change.

The epistemic agents producing knowledge about climate change that were analyzed in this dissertation include governmental agencies, right-wing political parties and think tanks, environmental groups, and energy companies. Right-wing institutions and energy companies challenge the notion of climate change as imminent threat, as proposed by environmentalists and climate scientists, arguing that climate change does not require urgent solutions, whether through environmental regulations or behavioral changes, especially if the economic costs of these solutions could reduce corporate profit margins. Within this group, climate change is discussed in three ways. First, climate change is represented as a natural component of global climate cycles. As part of this first tactic, climate change becomes a natural and external phenomena, which cannot be caused by humans or, more specifically, is not linked to the burning of fossil fuels (for instance, by energy companies). Second, if climate change is a natural
part of the biosphere, there is nothing human societies can do to change the course of climatic events (i.e., environmental regulations are unnecessary and costly). Instead, carbon dioxide will eventually enhance the vitality of the biotic community and, therefore, enhance the vitality of the human community. Third, continuing in the vein of climate change being a natural process, the science finding anthropogenic climate change to be a new and solely human-induced phenomenon that will have a negative effect on the planet must be false (based on inherently flawed scientific data) or ideological, and those who promote it (scientists, politicians, environmentalists) are misleading the public for political reasons.

Rather than attempting to explain “the persistence of capitalism despite its contradictory tendencies” by externalizing nature, Huber (2013, p. 171) argues that nature must be viewed as an internal component of the accumulation process. Even though Huber is interested in the overall influences of petroleum, he states that, “massive productivity gains in the labor process, powered by electricity, created larger pressures for an equally energy-intensive geography of consumption.” The geographies of consumption include the comforts offered by electrical devices within private homes and the suburbanization process that expanded distances between home, work, and other places of consumption. Cheap energy from fossil fuels, “allowed for an overall cheapening of the production of all sorts of goods that lowered the cost of labor power … Thus, the postwar economy created new standards of consumption in energy terms” (p. 180). Suburbs have become the conceptual middle ground between two metaphors: wilderness and the inner city. In this way, suburban living can reduce the tension
between the need to be close to nature, and the need to move away from nature to fulfill consumption needs. The suburban neighborhood, in fact becomes the place where are slowly dismantled and reassembled in a form that is conducive to capital accumulation.

**Perspectives from a Suburban Neighborhood**

One of the main objectives of climate reports released by the IPCC and other scientific bodies is the ability to predict the types of the negative outcomes associated with climate change that will befall human societies and the rest of the world’s biotic community. The thrust of this discourse is that if nothing is done to mitigate carbon emissions, a wide range of dangerous effects from desertification to inundation of coastal cities will be experienced. But people, especially those living in relative affluence, are not always affected by dire predictions of climate science. Predictions of this type are deemed spatially and temporally distant from everyday life. Discourses that communicate images of melting ice-sheets in Greenland and Antarctica remove the spatiality of climate change to distant places. Simultaneously constructing uncertain and distant time-horizons only serves to dissolve tensions and eliminate any sense of urgency. In this sense, climate reports created by the IPCC possibly smooth tensions suggesting that tangible outcomes of carbon mitigation policies will not materialize in the short-term.

As the interviews revealed, electricity consumption has been driven from the level of immediate consciousness and reduced to economic expressions. The term *phantasmagoria* seems more fitting to describe energy networks, exchanges, and flows hidden underground and behind walls, facilitating people’s disaffected relationship to
energy consumption. As energy consumption has been rendered invisible, so have connections to climate change. “Climate change” appears to float apart from daily practices that necessitate “normal” suburban lifestyles. Climate change is conceptualized as beyond the reach of an individual, family, community, or even a nation. As an infinitely complex phenomena, climate change becomes divorced from daily life. While some of the interviewees expressed anxiety about climate change, they also expressed powerlessness and helplessness. Due to the broad scale and scope of climate change, as the interviews indicated, people often mentioned government intervention as the only effective way to force fossil fuel industries to reduce their carbon emissions.

For many people, alternative technologies are not feasible due to costs or due to lack of existing models of successful alternative energy use, largely prohibited by economics. Even if economic barriers to clean energy technologies were eliminated, the most intransigent barrier that must be overcome will remain in the realm of consciousness and knowledge. As this study has demonstrated, suburban residents are disconnected, confused, and in denial about the consequences of their actions in relation to climate change. In suburbia, capital rules through ideological formations as manifest in discourses, material practices, misrepresentation, and ignorance. Therefore, to mitigate carbon emissions in substantial ways, socially constructed barriers created by capital need to be analyzed and revealed.

Built environments, such as suburban neighborhoods, act as the material manifestations of capital’s ability and desire to mask the intensity and extensity of
flows. By spatially, and therefore cognitively, removing these flows from view, capitalism successfully eliminates any cognitive tension resulting from their presence. This landscape becomes illusionary because the relationship between social and natural environments becomes obscured. The history of environmental change reveals that “when there is a public stake, which means a moral, political, or economic stake” (Oreskes, 2004b, p. 381), as certainly exists in the climate change debate, a political consensus influenced by broad-based public support is a key factor preceding policy changes. Considering the eventual outcome of the DDT debate in the early 1960s, Oreske writes that, “it simply shows that informed public policy was implemented based on a consensus of relevant scientific experts, a consensus that was accepted by politicians with the authority to act upon it, and with which the public by and large appears to have been content.” She argues that consensus within the scientific community is important, but not a necessary requirement for implementation of public policy. The climate change debate possesses the strong scientific consensus which the DDT debate lacked, but is missing consensual agreement in both the public and political realm. Until this consensual component firmly exists within the public and political realms, it seems unlikely that climate change will be addressed through legislative action.

**Limitations of Study**

This study has three main limitations, which also suggest directions for further research. First, in focusing on a small sample in one neighborhood, it can only provide
some glimpses of a more complex and nuanced everyday discussion of climate change. Large-scale surveys have often represented attitudes towards climate change as being polarized, but this study’s respondents while articulating broadly polarized institutional discourses, also reflected on the barriers that prevent them from fully understanding and engaging with the forms of environmental pollution that accompanies suburban living. It is likely that more intensive, qualitative studies can provide a more complicated view of how climate change is understood without painting all opinions as polarized, and this study has sought to move in the direction of conducting such a study.

Second, this study has focused on a relatively affluent, White population in a relatively well off suburb. It is likely that notions of climate change and environmentalism be different in other contexts, for example in a study conducted in downtown Tampa or in a less affluent neighborhood. A comparative study across two or more neighborhoods that differ in terms of location within the urban area and socioeconomic characteristics of residents would thus provide the basis for understanding how perspectives on climate change vary across the spatial and social landscape. This would again help in understanding the extent to which a seemingly polarized national debate is actually reproduced in everyday contexts.

Third, this study has sought to connect discourses produced at the national-level with everyday understandings of climate change, but knowledge of climate change is also derived from more immediate sources, for instance as membership is local business or environmental groups. The study of climate change knowledge thus needs to be
conducted at various scales beyond the everyday urban neighborhood and this could be another way in which to extend this study. Overall, climate change is a process that spans many scales and contexts, from the global to the everyday, and from scientific institutions to everyday acts of consumption. This study has sought mainly to focus on one aspect of this broader issue: forms of everyday knowledge of climate change. The need is for more studies that embrace the full gamut of the natural and social aspects of climate change and thus constantly reveal the material and discursive processes that shape everyday connections to global environmental change.
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APPENDIX A:

EMAIL SOLICITATION

USF IRB Protocol #13137

Call for participants in Dissertation Research!

My name is Chris Metzger, a doctoral student in the Geography and Environmental Science & Policy degree program here at the University of South Florida. I’m conducting dissertation research and I need less than 30 minutes of your time. I aim to speak with approximately 100 people who reside in either the Tampa Palms or Apollo Beach communities. My questions relate to social understandings and connections to nature, essentially I’m interested in your ideas about everyday aspects of suburban lifestyles and American ideals in relation to the natural world.

If you would like to be included in the study, and you meet the eligibility requirements below, please contact Chris Metzger at cnmetger@mail.usf.edu for more information. If you know someone who might be interested in the study, please forward him or her this email with my contact information.

Principal Investigator: Chris Metzger.
Faculty Sponsor: Pratyusha Basu, PhD

The purpose of this study is to:
- Better understand community understandings and connections to nature.

If you take part in this study, you will be asked to:
- Answer questions related to your 
- Contribute less than 30 minutes of your valuable time

To qualify for inclusion in this study, you must:
- Reside in one of the two communities of focus (Tampa Palms or Apollo Beach)
- Be at least 21 years of age
- Speak, read, and understand English, as the study will be written in English.
At least 100 participants will be included in this study, approximately 50 from Tampa Palms and 50 from Apollo Beach. You should only take part in this study if you want to volunteer. If you do choose to take part, you may skip any questions you do not want to answer.

There is no direct benefit to participation. This research is considered to be minimal risk, which means that the risks associated with this study are the same as what you face every day. All personal information (name, addresses, etc.) will be strictly confidential—and no identifiable information will be associated with your responses.

If you have any questions, concerns or complaints about this study, or if you experience an adverse event or unanticipated problem, please contact Chris Metzger (cnmetzger@mail.usf.edu). You may also email Dr. Pratyusha Basu (pbasu@usf.edu). If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.

By proceeding to the survey, you are consenting to voluntarily participate in this study; please proceed only if you understand the study and understand that participation is voluntary.
APPENDIX B:

INFORMED CONSENT FORM

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. We encourage you to talk with your family and friends before you decide to take part in this research study. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

We are asking you to take part in a research study called: 

The person who is in charge of this research study is Christopher Metzger. This person is called the Principal Investigator and is guided in this research by Dr. Pratyusha Basu. Christopher Metzger can be reached at cnmetzger@mail.usf.edu or 352-235-9407.

The research will be conducted at participants’ homes.

**Purpose of the study**

The purpose of this study is to:

- This study will investigate the environmental perspectives of local residents. Questions related to coal and electricity consumption in relation to environmental issues will be
asked in the hope of developing a broader understanding of your thoughts and opinions. By participating in this study you will be able to help scientists, corporate leaders, and policy makers develop effective strategies that would be supported by members of the local community.

• This study is being conducted to support dissertation research.
• Eligibility requirements to participate in this study are as follows:
  o Participants must reside in either the Apollo Beach or Tampa Palms neighborhood.
  o Participants must be over the age of 25 and be normal, healthy adult subjects.

**Study Procedures**
If you take part in this study, you must agree to all of the following:

• You will first be asked to provide non-identifiable demographic information, including general background information, such as age, time in community, monthly energy use, etc. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The information you provide is confidential; your name is not being included on the forms, only a number will identify you, and no one else will have access to your survey.

• You will then participate in a brief interview, including perceptions of coal production and electricity consumption. If you do not wish to answer any of the questions during the interview, you may say so and the interviewer will move on to the next question. No one but the interviewer will be present unless you would like someone else to be there.

• You will be asked for approximately 30 minutes of your time to complete the interview and questionnaire.

• You will meet with the PI at your home or public setting, such as a library.

• You agree to the entire interview being audio-recorded, but understand that you will not be identified by name on the tape. The information recorded is confidential and no one else will have access to the tapes or information documented. The tapes will be destroyed after completion of the study.

**Total Number of Participants**
About 50 individuals will take part in this study.

**Alternatives**
You do not have to participate in this research study; it is entirely voluntary.

**Risks or Discomfort**
This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.
Compensation
You will receive no payment or other compensation for taking part in this study.

Cost
There will be no additional costs to you as a result of being in this study.

Privacy and Confidentiality
We will keep your study records private and confidential. Certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The Principal Investigator and any other research staff.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS) and the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and its related staff, who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices that oversee this research.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

Voluntary Participation / Withdrawal
You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

You can get the answers to your questions, concerns, or complaints
If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.

Consent to Take Part in this Research Study
It is up to you to decide whether you want to take part in this study. Please understand that my
proceeding with the procedures described above you are agreeing to take part in research. I freely give my consent to take part in this study and authorize that my information as agreed above, be collected/disclosed in this study. I have received a copy of this form to take with me.

______________________________________________
Signature of Person Taking Part in Study             Date

____________________________________
Printed Name of Person Taking Part in Study

**Statement of Person Obtaining Informed Consent**

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/ she understands:

- What the study is about;
- What procedures/interventions will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. This subject does not have a medical/psychological problem that would compromise comprehension and therefore makes it hard to understand what is being explained and can, therefore, give legally effective informed consent. This subject is not under any type of anesthesia or analgesic that may cloud their judgment or make it hard to understand what is being explained and, therefore, can be considered competent to give informed consent.

______________________________________________
Signature of Person Obtaining Informed Consent / Research Authorization             Date

____________________________________
Printed Name of Person Obtaining Informed Consent / Research Authorization
APPENDIX C:

DEMOGRAPHIC SURVEY FORM

Q. What is your gender?
   ____ Male
   ____ Female

Q. In what year were you born? ___________

Q. What is your marital status?
   ____ Currently married
   ____ Widowed
   ____ Divorced
   ____ Separated
   ____ Never married

Q. What is the highest degree or level of school you have completed?
   ____ No high school diploma or GED
   ____ High school graduate - high school diploma or the equivalent (for example: GED)
   ____ Some college credit, but less than 1 year
   ____ 1 or more years of college, no degree
   ____ Associate degree (for example: AA, AS)
   ____ Bachelor's degree (for example: BA, AB, BS)
   ____ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
   ____ Professional degree (for example: MD, DDS, DVM, LLB, JD)
   ____ Doctorate degree (for example: PhD, EdD)

Q. What is your political affiliation?
   ____ Democrat
   ____ Republican
   ____ Independent
   ____ Other (specify) ______________________

Q. What is your employment status?
   ____ Employed for wages
   ____ Self-employed
____ Out of work and looking for work
____ Out of work but not currently looking for work
____ A homemaker
____ A student
____ Retired
____ Unable to work

Q. How would you describe your employer?
____ Employee of a for-profit company or business or of an individual, for wages, salary, or commissions
____ Employee of a not-for-profit, tax-exempt, or charitable organization
____ Local government employee (city, county, etc.)
____ State government employee
____ Federal government employee
____ Self-employed in own not-incorporated business, professional practice, or farm
____ Self-employed in own incorporated business, professional practice, or farm
____ Working without pay in family business or farm

Q. Please describe your housing. Is this house, apartment, or mobile home...?
____ Owned by you or someone in this household with a mortgage or loan?
____ Owned by you or someone in this household free and clear (no mortgage or loan)?
____ Rented
____ Occupied without payment

Q. What is your total household income?
____ Less than $10,000
____ $10,000 to $19,999
____ $20,000 to $29,999
____ $30,000 to $39,999
____ $40,000 to $49,999
____ $50,000 to $59,999
____ $60,000 to $69,999
____ $70,000 to $79,999
____ $80,000 to $89,999
____ $90,000 to $99,999
____ $100,000 to $149,999
____ $150,000 or more

Q. Where do you obtain most of your information related to current events?
____ AM Radio
____ FM Radio
____ Local Newspapers
____ National Newspapers
Network News (ABC, NBC, CBS, PBS)
Cable News Networks (please choose the most frequently watched)
   - CNN
   - MSNBC
   - Fox News
   - Other (specify) ____________________
Books
Academic Journals
Magazines
Online Blogs and Social Media
Word of mouth

Q. What is your average monthly energy bill?
   - Less than $100
   - Between $100 - $150
   - Between $150 - $200
   - Between $200 - $250
   - Over $250

Q. Please specify your ethnicity.
   - Hispanic or Latino
   - Not Hispanic or Latino

Q. Please specify your race.
   - American Indian or Alaska Native
   - Asian
   - Black or African American
   - Native Hawaiian or Other Pacific Islander
   - White
APPENDIX D:
INTERVIEW GUIDE

Electric supply
1. Do you ever consider the ways in which electricity is transmitted to your home (through power lines, etc.)?
2. Has your home ever lost power due to a hurricane or other natural event? What were your feelings at that point?
3. From where does your home obtain electricity? What fuel source does your electric company utilize to produce power? What is the place of origin of this fuel?
4. What type of information do you get about the electricity you use? Does your electric company provide this information?
5. Would you be concerned if your electricity provider used coal as fuel source?
6. What would you say are the advantages and disadvantages of coal as fuel source?
7. Have you come across any information on the environmental impacts of coal mining? Where did you come across this information and how did it affect your attitudes towards coal?
8. What sources of energy would you say would be better than coal?
9. Are there energy sources that are more problematic than coal?
10. What do you think about substituting natural gas for coal? Or would this also have its own problems?

Consumption and lifestyle
11. What do you feel about the amount of electricity you consume? In what ways has electricity consumption become an issue of concern for you? Or has it not been an issue of concern?
12. Is the cost of electricity an issue for you? What do you think influences the cost of electricity?
13. Have you tried to curb your consumption of electricity? In what ways?
14. Has your electricity provider ever suggested any ways for electricity consumption to be reduced in your home? In what ways?
15. Do you feel you have choices in where your energy comes from?
16. Have you ever sought to install alternative sources of energy in your home?
17. What do you consider to be your personal impacts on the natural environment? Would you consider your lifestyle to be sustainable?
18. Do you worry about the impact your consumption has on other communities in the U.S.? On people across the world?
19. What do you do currently to reduce your impact on the environment? Do you have any plans to reduce your carbon footprint in the future?
20. Do you feel you have the power to make meaningful environmental changes?

**Environment and climate change**

21. Do you consider yourself to be an environmentally conscious person? When did you begin to take an interest in environmental issues? What sparked this interest?
22. Who or what do you think causes the most damage to the environment? Individuals? Other countries? Corporations? Governments? Or a combination of some or all of these?
23. Do you think you currently live in a neighborhood with a clean environment? Or what are some of the environmental problems you’re currently facing?
24. What do you understand by climate change? Do you think it is occurring due to natural or man-made reasons?
25. Where did you obtain knowledge about climate change? Has your electric company ever brought up this issue?
26. Do you think the Tampa Bay region be affected by climate change? In what ways? What is the timeframe within which climate change effects will begin to be experienced here or are we already experiencing them?
27. Do you worry about the impacts of climate change on future generations? Do you think your children or grandchildren live/will live in a healthier and more stable environment than you have lived in?
28. Do you think corporations are concerned about climate change? In what ways are they part of the problem or part of the solution?
29. Do you think scientists have a good understanding of climate change?
30. Do you think the government has taken adequate steps to deal with climate change? In what ways?
31. Do you think other countries have to be held more responsible for contributing to climate change? In what ways?