Embodied Climate Change: Materiality, Language, Mediation And the Legitimation of the Unintelligible

by

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ABSTRACT

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"Embodied Climate Change: Materiality, Language, Mediation and the Legitimation of the Unintelligible" examines the intersections of language, technology, and the human and nonhuman worlds through the example of climate change. I posit that human technology, specifically language and digital media, have codified the human and nonhuman worlds into a "mixed-reality" of virtual, actual, and potential lived experiences. These technologies have, for better or for worse, de-materialized local human embodiment and re-materialized it in the global sphere of a technological/natural-reality. The re-materialization shapes not only how humans locate themselves within the world but also how they approach and understand phenomenon like climate change.

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CHAPTER 1

INTRODUCTION

1.1 The Confluence of Language, Technology, and the World[1]

In this dissertation, I examine the connections between the human and nonhuman worlds and how materiality—broadly conceived—gains intelligibility through a meaning-making process, in this project a process dependent on language and digital technology. "Materiality-as-meaning-making" (MAMM) analyzes the ways in which intangible and unintelligible "things" become material and have material consequences through language use and digital re-presentations.[2] "Things" become material and have material consequences (or gain a level of intelligibility) through the intra-actions between nonhuman, human, and the artifacts of language use and digital re-presentations. Language practices that consider the self, the world, and the connections and relationships between them help analyze how immaterial acts (such as speech) have very material consequences. Similarly, digital technologies that provide imaging of otherwise unintelligible phenomena help establish and make more intelligible connections between the human and the nonhuman.

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[1] Before moving too far along, I should address my approach to and use of global climate change. I take for granted that the science behind global climate change has been soundly established; I will not address the science save for a brief historical details from Spencer R. Weart's *The History of Global Warming* as a means of approaching the history of climate change study. I will not address "natural" versus "human induced" climate change. I take that both causes are at work. Global climate change is happening and has happened without human influence on it. Yet at the same time, it would be difficult to ignore the data linking human activities of the industrial age that accelerate climate change. Although it should be clear that I am not a climate change denier nor alarmist, the focus of the project is how the intelligibility of the phenomenon is almost entirely wrapped up in the language and digital technology practices and not some other completely material indication. Certainly the altering landscape, specifically in glacial regions and coastal geographies is a significant indication, but my interest lies in how the phenomenon plays out through the collision of language, digital technology, and mediated connections to the human world.

[2] I will address in greater detail the terms "intra-act" and "re-presentation" in the next chapter; briefly, however, "intra-act," describes the actions between relations of things and not a priori things. A "re-presentation" is a material performance that produces material-semiotic consequences. The act and object of re-presenting are not copies of the original, but an intra-action within the process of meaning-making. Re-presentations are material variants that carry material consequences as the object of the event of re-presentation.

Discursive and technological considerations (and re-presentations of them) can ensure that the environment is understood not only as a site for human development but also as having materiality, acting, and ultimately having agency.[3] Approaching the nonhuman world as a part of and apart from (with a converging trajectory) the human world may guarantee that discursive analysis and technological approaches do not eliminate materiality by focusing on predominately human ideas. Hurricane Katrina provided a complex example of the knotted connections between nonhuman and human. Van Jones and Nancy Tuana argue Hurricane Katrina is a clear example of the intra-actions between nature/culture, human/more-than-human, material/semiotic, flesh/technology, and virtuality/reality ("Viscous Porosity," "In Katrina's Wake). Tuana examines the firm, but malleable categories that have come to mark the storm, suggesting the mutual influences and connections between human and nonhuman.

[3] In the dissertation, I take the idea of agency for granted. Nevertheless, it seems relevant to devote some space to the idea of "agency" as it comes up in the environmental humanities. In many examples, agency is, in Karen Barads terms, a "doing." Agency is not an intention, a reaction, or a choice, as these definitions would place agency almost completely in the realm of the human, with the exception of some organisms and animals (See Agamben's work in *The Open*). In other words, there is a trend in environmental camps to acknowledge agency where there are no clear subjects, or acknowledge agency where there are many subjects (in climate change for instance). It seems current definitions subscribe closely to the idea that "[n]ature is out there. It grows, swims, flies, and multiplies in diverse ways irrespective of our cultural meanings and conventions" (Maran, "Where Do Your Borders Lie?" 455), or ideas that culture is embedded in nature thereby making acts of agency both natural and cultural (see Val Plumwood's "Nature as Agency" 29). Agency seems to be an action (at least as a verb) that can be preformed by potentially any organic or inorganic substance and by any events that may occur thereby (floods, droughts, climate change). In other words, the entire planet has agency and is agentic. Andrew Pickering extends the notion of agency and materiality further through his "mangle" in which he describes the intra-actions of human and nonhuman agency through the "actor-network" of science. For Pickering, and others, nonhuman and human agency is balanced, i.e., humans do not do all of the "doing"; nonhumans are not empty vessels waiting to be given meaning and action. "The world," claims Pickering, "is continually *doing things*, things that bear upon us not as observation statements upon disembodied intellects but as forces upon material beings" (*The Mangle of Practice* 6). Pickering sites "natural" events as nonhuman agency (or material versus human agency as he terms it) that "comes from outside the human realm and cannot be reduced to anything within that realm" (6). While I subscribe to this idea, I am a little uncertain how a treatment that essentially claims everything has agency covers issues such as free will, instincts, cognition, and intent that are at the foreground of environmental definitions and actions. I understand that a more holistic definition of who and what have agency was greatly needed, as it rebelled against completely anthropocentric ideas of the environment; I would say that for this project, agency is a "doing," performed (intentionally or not) by any object or subject in the process of meaning making.

Similarly, Van Jones challenges his audience to stop approaching Hurricane Katrina as isolated and unique and start understanding "it" as widespread, and happening outside of terrestrial Louisiana.[4] Van Jones uses Katrina as a metaphor to address the "flood" of environmental and cultural problems—such as credit card dependency and living beyond sensible means. Jones' treatment of the storm suggests that the events of Hurricane Katrina are as much a cultural debacle as nature striking. He argues that future effects of future "disasters" will be measured by lifestyle changes and the loss of the dominant views of "living the good life." Many of these changes will include consequences that cannot be mapped at this point; however, they will affect the lived experiences and material lives of people all across the planet ("In Katrina's Wake"). Although many of us never lived directly in the storm, we became excruciatingly familiar with it through the coverage it received, and still receives today. The world viewed images and heard stories, and, as Van Jones did, we drew parallels with elements of our own lives that created even greater connections to the tragedy. After the levees broke in New Orleans, we all questioned the stability of our own "levees" and their ability to hold back our own floodwaters. Many were impacted through the mediation of mass communication technologies. While not "there," many people felt as if they were.

As scholars have long argued, mediating practices bring the world closer to us. Marshall McLuhan examined the role of television as a tactile extension of the senses that brings the world into our lives (*Understanding Media*). This ability to bring the "outside" in or to extend the senses out, although fairly commonplace, proves extremely important in gauging material consequences at home and abroad. It would be difficult to argue that Hurricane Katrina did not have material implications for those situated hundreds and thousands of miles away.

[4] Coincidentally or not, Hurricane Katrina, though not the first weather phenomenon associated and publicized with climate change, arguably garnered some of the most prolific coverage deliberately connecting the two. Much of the discourse surrounding the event questioned human contribution to the storm through altering the atmosphere and landscape. Moreover, the aftermath of the storm painted a clear picture of despair and turmoil that has become a symbolic image of what may happen to humans (and culture) as they are forced to adapt to life on a warmer planet.

Climate change is no different. While everyone lives "in" climate change, the extension of the senses through mediating practices is necessary in order to provide intelligibility to events in distant locals and to the recognizable demarcations that signify the happenings of climate change. As I will examine briefly in this chapter and more thoroughly in chapter 3, media-dominant approaches, such as Al Gore's 2006 film *An Inconvenient Truth*, capitalize on rhetorical appeals and framing practices as well as more confrontational imagery and performing practices. While the "success" of the film should be questioned, its national and world-wide release, reference in popular and scholarly journals, and propulsion of Al Gore to climate messiah, suggest that the "message" of the film reached broad and diverse audiences. Certainly science and "facts" were imperative in the film and its reception; but perhaps more paramount to the film's approach were the configurations and articulations of language ("captured" moments of signification practices between self, others, objects, and the world) and "digital materiality" (the digital connections between human and nonhuman phenomena, the orientation to the world). The use of poignant and political discourse that spelled out the tragedy of climate change and the connection with digital applications that re-presented climate data and potential landscape (and human) degradation facilitated an embodied extension for viewers into the nonhuman world, allowing better associations of spatial, temporal, and unintelligible constraints, which are necessary for the treatment of climate change.

1.2 Language and Materiality

With language, however, the problem becomes one of "voice," as Lawrence Buell reminds us, because we cannot speak *as* the environment. We can only speak *for* the environment or as (an anthropocentric) part of the environment; we can only speak for what we *think* is best for the environment and our relationship with it (*The Future of Environmental Criticism* 7). Nevertheless, as Buell argues, all linguistic endeavors, all "artifacts," have a connection to the world. That is, language helps produce elements of the material world (Wittgenstein, *Tractatus*). Buell argues specifically for a "word-world" connection to the material

world, claiming that in any type of writing (or language) words, sentences, and propositions are connected to the material world (10, 30). But as many scholars point out, the word-world relationship has not always been an equitable one, especially as the linguistic turn argued more strongly for the role of language in producing the world. Although, as many of the essays in *Material Feminisms* argue (to varying degrees), language does not construct the material world but provides a degree of meaning-making about the material world. Language only means (or even "constructs," using the term loosely) because the agency of the material world pushes back, inserts into, and acts upon us as we attempt to categorize and make sense of it. Less than an Edenic garden waiting for nomenclature, the material world means because it acts and forces our hands to acknowledge its role in our own and the world's construction. In *A Thousand Plateaus*, Deleuze and Guattari argue that assemblages act on "semiotic flows, material flows, and social flows simultaneously." For Deleuze and Guattari, "[t]here is no longer a tripartite division between a field of reality (the world) and a field of representation (the book) and a field of subjectivity (the author). Rather, an assemblage establishes connections between certain multiplicities drawn from each of these orders, so that a book has no sequel nor the world as its object nor one or several authors as its subject" (23). The collective assemblages that Deleuze and Guattari forward are intra-actions of humans and nonhumans, folded within the semiotic process of human creativity. The word and its subjective attachments flow within and out of the world, creating a human + nonhuman + sign = assemblage.

But is such an assemblage between language and the material world easy? What does language do for and/or against materiality? How do language, words and discursive practices, constitute a "materiality" in terms of the given material "object" and/or in terms of the material consequences? For example, what does it mean when the term "green" represents "green/sustainability" for the environmental movement as well as more environmentally considerate products for manufactures? As many irritated environmentalists will argue, the meaning of the term "green" and the sense in which it is used are often completely different.

Gottlob Frege, in "On Sense and Meaning," argued that the "sense" and "reference" of a word or sentence are not the same, nor do the two necessarily imply one another. Meaning is constituted by what the reference denotes. At the same time though, the utterance has a "sense." The sense of an utterance can be all of the associations of a word or a sentence that are "handed down" from generations, and the sense is also "publically recognizable."[5] According to Frege, meaning is dependent on the use of words not the words themselves. "Sense," fluctuates between individuals, communities, and even different contexts of use (time, place, and situation). By Frege's treatment, materiality is located in the implications and consequences surrounding the sense and meaning of a reference. The use of the term "green" by Greenpeace will have a different meaning (though perhaps a similar sense) than the use of the same term by a chemical company.

In general, it can be argued that language is situational; different situations, different purposes, and different communities call for different "languages." According to the later Ludwig Wittgenstein, languages situate people in the world, and thus, somewhere in the theoretical spectrum of varied language use. For him, languages are not partial or incomplete, but are complete and situate people in the world; he termed this idea "language games." "Family resemblances," similar forms of words or sentences, allow people to work through different language games and situational uses of language. Neither in language games nor in family resemblances are the distinctions or borders insurmountably rigid; rather, words in a set are intertwined, and one word may share a similarity with another, yet not an essence (*Tractatus*, *Blue and Brown Books*).[6] Like Frege, Wittgenstein understood that meaning was ultimately

[5] Frege's argument essentially distinguishes between the ways in which we "point to" an object (the sense) and the how we designate an object (the referent). While the referent may be the same, often the sense is different. Thanks to Kevin Porter for clarifying the distinctions in Frege's argument.

[6] Wittgenstein's argument was as follows, in a set, say *a*, *b*, *c*, *d*, *a* and *b* share similarities, *b* and *c* share similarities, and *c* and *d* share similarities. However, *a* and *c* or *a* and *d* don't share similarities. The set has a "family resemblance" because of the thread, the likeness that runs through, but not the essence. In the term *green* for example, *green-a*, *b*, *c*, and *d* do not share

made within the situations in which language was used and by the use of language not the languages (or words) themselves.

Like Frege, the (later) Wittgenstein argues that meaning is made through the use of language in given circumstances. In other words, although language games and family resemblances escape a direct materiality, it is within/from the uses of language that materiality is enunciated. Nevertheless, "language" is many different languages, so too can one argue that a Wittgenstein treatment allows for a "materiality" that is many different materialities (as results of, consequences of, or interactions of the language games and the world). Put another way, a Wittgenstein materiality, like his treatment of language, forwards a diverse range of "material games" that have "material resemblances." Materiality (much like meaning) is made by the articulations and consequences of the language games not the language games themselves (or, even further, the propositions and words of the language games). The material resemblance allows materialization of the actions to cross into/through different groups.

Whether language is parallel to reality (Saussure, "Course in General Linguistics") a picture of it (early Wittgenstein, *Tractatus*), or reality brought to life (Barthes, *Mythologies*, *Elements of Semiology*), language cannot be considered as completely abstract and in a vacuum. Thus, questions concerning what or how language connects to and makes intelligible the material world (including "material/semiotic" examinations) are not only valid but also crucial to environmental considerations as often times it is discourse that predicates the material world.[7] In the implications of articulated language, the revealing of the materiality of language

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an essence, but one could trace a similarity through the term. If "a" and "d" represent extremes of the term (say environmentally friendly and a marketing term, respectively), then a consumer can navigate the uses of the term via its resemblance, but ultimately have to focus on the contextual use and the consequences of the term. Thanks to Kevin Porter for helping to clarify the nuances of Witgenstein's argument.

[7] For Donna Haraway, material-semiotic refers to the complex productions between the material world and signs. Both the material and the semiotic are agents that ultimately comprise the relationship between thought and world that humans interact with. The material-semiotic (and material-semiotic actors) produces "objects of knowledge" within the "social interaction among humans and non-humans" ("The Promises of Monsters" 68).

use suggestions to the ramifications of the use of terms such as “green” that intend to represent entire uses of the term (perhaps Saussure’s “langue” extending too far, too forcefully, into “parole”).[8]

Language use is a double-edged sword that at once can convince the public through accurate, logical, and identifiable words and rhetoric. Yet, just as easily, the homogenization and “watered-down” rhetorical strategies and word choice turn the general publics’ attention away from the severity of the issue or the issue all together. As I will address later in the chapter as well as in chapter 3, Diesel’s 2007 campaign, “Global Warming Ready,” used climate change as a backdrop for marketing their jeans. In the advertisements, models posed within various landscapes altered by increased temperatures. The advertisements appear to dismiss the severity of climate change focusing instead on the appeal of their apparel to a post-climate-change (hip) crowd. Perhaps easy to dismiss as a tongue-in-cheek advertisement, the ad nevertheless exemplifies the pitfalls of environmental representation. Annettee Kolodny takes representation a step further, arguing, “I’m inclined to believe that there is no innocent experience. By that, I mean that all experience is mediated through culture, and that when one reports an experience, either to yourself, in a personal journal, or to an external audience, what you’re really reporting is the way in which whatever happened was given meaning through the narratives and belief systems that your culture made available in the first place” (“Taking Back the Language” 22). The problematic steps of relating an environmental issue happens because—just as translating scientific data into palatable, public terms—most rhetorical and language practices that occur on the large cultural scale are common, familiar, and carry well-worn (and known) assumptions. The terms “global warming” and “climate change,” while often thought of as synonymous, carry substantial cultural baggage. Some scholars argue that “global

[8] Bertrand Russell contested this idea. Russell questioned whether or not one term could represent all uses of a term. For example, he questioned whether “red” could represent all red objects. Ultimately, Russell argued against such representation, forwarding that terms do not have single, fixed uses, a theme that will be recurrent throughout this project.

warming" refers to anthropogenic influence on climate while "climate change" points to a "natural" change in climate (Bolstad qtd. In Foust & William 155). Still others contend that "climate change" more accurately reflects the drastic and volatile climate patterns that have developed within the gradual, but noticeable, planetary warming trend. "Global warming," while accurate, betrays the fluctuations within climate, soliciting more doubt from the public.

Moreover, discussion of environmental issues (especially those which were or are heading to catastrophes) use the present and the past to predict the future with confidence. This (although necessary) approach causes problems for the rift between experiential and abstract experience (argues Andrew Szasz in *Shopping Our Way to Safety*). More incongruous, as Jimmie Killingsworth and Jaqueline S. Palmer argue in their seminal work on rhetoric and environmental politics, "[f]acts do not exist in the future, only probabilities and projections. That is why, as Aristotle knew, deliberative discourse—that which debates the course of future action—always involves rhetorical appeals and can never be strictly descriptive and objective" (*Ecospeak* 68). Ultimately, then, language is best gleaned in the process of mediation even as it holds material and corporeal properties. Annette Kolodny argues that language mediates experience. "In other words, the final written account is inevitably partial and contrived, a shaping and reshaping of whatever the actual raw experience might have been…. [Writers] are writing about how they understand reality *in the terms and language and story patterns made available to them by their culture*" ("Taking Back the Language" 9).

1.3 Technology and Materiality

Technological devices and approaches shape and influence the reception of environmental issues.[9] As the sonogram ushered in a new politics for pro-life and pro-choice arguments, so

[9] A quick note, throughout the project the terms "digital," technology," "virtual," "computer," and so forth will be used interchangeably. While I feel that an entire project could be based on the validity and necessity to not conflate these terms, I also feel that in my research the scholars whom I am quoting are using these terms to address our embodied connection with and mediation of the world.

have new technologies given a closer, more intimate examination of and relationship to the nonhuman world (Barad qtd. In Hekman). Hurricane Katrina provides an excellent illustration of this point. Not only did technology play a role in the attempts to predict the course of the storm but faulty technology also became a way to justify the outcome of the storm. Had it not been for the failure of the old levees, the impact of Hurricane Katrina would not have been as severe, so the argument goes. The ability to predict weather and climate through digital simulations has become a key technology in the 21st century. Such technologies utilize past and real-time data to predict future occurrences of storms and other disasters. "The Global Earth Observations System of Systems [GEOSS]" explains French Geophysicist José Achache, is "a 10-year endeavor to link the data-collection of 74 nations." The goal of the project is to produce more accurate climate models well in advance (months, perhaps) of Katrina like disasters (Tabor, *Wired* 34). Likewise, NASA has developed (or attempted to develop) several technologies that map and visualize climate and greenhouse gases in the atmosphere. Again, the goal is to better predict climate and, as a result, better prepare for or change the potential of a radically different planet. I will address these examples in chapter 4.

Beyond extravagant examples of technological applications that require major funding, the use and presence of computers and computing becomes more commonplace. From social networks to cell phones to GPS navigation, humans are increasingly connected through technology in their daily practices, almost to the point of ubiquity. If we take Edward Tenner's definition of technology as "the human modification of its biological and physical surroundings," it becomes clearer that humans are always embodied and function with/through their embodiment (*Why Things Bite Back* xi).[10] Humans' lived experiences are mixed with

[10] While I recognize that this statement is a tautology, I think that general recognition of the imbedded connections between humans, technology, and the environment is too frequently overlooked. There seems to be a concerted effort to separate humans from technology and the environment, without much thought to how humans are always already technological.

technological applications, and viewing climate through simulators becomes perhaps more customary as an extension of the senses.

Maurice Merleau-Ponty claimed that embodiment entails two things: the physical body (the body in and of itself) and the body-as-being (the body as becoming with its experiences in the world). The use of prosthetics is a case of a physical (and quite literal) embodiment of technology. Moreover, embodiment extends to the discourse, reception, treatment, and so on, of the prosthetic apparatus by the individual and society: the ongoing development of the body-as-being. The physical/technological embodiment also has a psychological aspect of how the individual is "being" in the world (*Phenomenology of Perception*). In short, Merleau-Ponty's embodiment maintains the strictly technological embodiment as well as an embodiment of how one situates him/herself in the world, which according to Don Ihde, is the recognition that embodiment is the complex inclusion of both personal and external agency and the influences that surround them—tangible or not (*Bodies in Code*).

Embodiment is also a form of "remediation," the refashioning of older and multiple media into new media (the radio, television, video recorder into a single computer, for example). Jay David Bolter and Richard Grusin point to "immediacy" and "hypermediacy" as critical examples brought forth by the computer and internet (perhaps the pinnacle of remediation). Immediacy makes media invisible, drawing the focus to the object of mediating medium itself. Hypermediacy exemplifies the medium, and not the object. However, though conceptually these categories appear opposite, they often work together. Immediacy and hypermediacy provide an embodiment that extends to the medium as well as the object of mediation—the extension of medium and mediation, and connection of medium and mediation.

Remediation demonstrates the extent to which technology is present in our lives. The extension of the senses into various media, according to some new media scholars, produces "mixed" or "augmented" realities (Lévy, Hansen, Bolter and Grusin, Ihde, and others). Mixed and augmented realities (mixed realities from here) are seamless intrusion of (and dependency

on) technologies such as video cameras, computers, and other devices in "reality." The term dissolves borders that at one time held technological objects separate. This "urbanization" of technology and body and global space, as Paul Virilio suggests, is the rapid incorporation of technology into people's daily lives and lived experiences to the point in which they become more and more common and even more "real" (*Information Bomb*, *Open Sky*).[11]

Mark B. Hansen, who is ultimately interested in the materialization of technology, suggests that technology is real and not simply a representation of human endeavors; it exists alongside and with the human world, and technology is as real as interacting with other humans. Moreover, Hansen argues that we embody technology by altering its construction, use, and interpretation (*Embodying Technesis, Bodies in Code)*.[12] When we understand technology to be the appropriation of the environment and other things for human use—Tenner's definition—notions of embodiment and mixed realities become easier to recognize. One could argue that there is an implicit notion that a degree of embodiment is "always already" in contemporary society.

Katherine N. Hayles claims that humans are always already embodied by technology: a human life has become a technological life. Daily practices are dependent on technology in order to "get by." Thus, embodiment is a crucial means of looking at the material world, not only in terms of how obvious embodiments of technology influence humans' abilities to cope with the

[11] And vice versa of course. Technologies become more embodied by human influence as they become transparent and more familiar as common human appliances. Edward Tenner cites the example of difficulty in programming a VCR that has become so easy that it often times requires only the push of a button (*Why Things Bite Back* xii). Similarly, Howard Rheingold examines cell phone cultures that have risen up around the world (most specifically in Japan) in which the phones become "humanized" by their users. For example, phones are programmable to give off signals when one is near a potential mate. This of course is an example of personalized ubiquitous computing as users can program in any number of personal interests such as coffee shops, and movie theaters (*Smart Mobs*).

[12] Computing and cell phone culture has continually attempted to personalize and humanize the media. From search engines, to cell phone interfacing, the attempt is to connect more closely to the device (giving more of an important role—hypermediacy) while simultaneously eliminating the constrictions and impersonality of the device (giving more immediate connection to the object of mediation—immediacy).

world (and it has become a coping), but also how not-so-obvious embodiments of discourse and metaphysical considerations weigh on human endeavors. For Hayles, posthumanity speaks to the re-situation of subjectivity, of human embodiment with and by technology. Thus, to consider the material world is to consider how humans as subjects, objects, and materiality are ultimately embodied by the technology they use (*How We Became Posthuman*).

Technology plays a role in the way we observe, understand, and interact with our environment and, perhaps to a greater extent, our culture.[13] Technology, especially digital technology, has been paramount in examining climate change, not only for its ability to expose the unintelligible elements through visual data but also how climate change is mapped onto culture(s) through its accessibility. From understanding to action, climate change is very much a cultural concern. Even when faced with the promise of technology to save the planet from the severe warming trend, how we choose to act (i.e., doing nothing or cutting our own emissions) is almost entirely based on our cultural norms (unless forced politically, for example). Moreover, the radical shift in many cultures of "being connected" and "always plugged in" has produced a hybrid experience of digital and analog (with extremely malleable borders) in the lives of many people. This visual commonality also provides a link in the fluctuating gap between scientific discourse and cultural expertise, or recognition of digital data and its visualized re-presentation versus more abstract and less concrete experiences of climate change. Although the sciences have capitalized on visual representations, as Lev Manovich contends, "in the cultural sphere visualization until recently has been used on a much more limited scale" ("The Anti-Sublime Ideal in Data Art"). As the scale and frequency of visualization increases, more identification of

[13] As noted above, technologies should be understood as cultural forms, what Flew refers to as "cultural technologies" (*New Media* 30). The connection here between culture and technology is an obvious but difficult one. As a part of our lived experiences, technology cannot be separated from our personal and cultural orientations of the world. Flew, among others cited in this project, elaborates on the connection between culture and technology, stating that 1) technologies must be understood "for the content they distribute" and resulting "social meaning" and "systems of knowledge" that "accompany their use and development"; and 2) the definition of culture must include the ways in which culture is a "structuring system, or a series of codes and conventions through which social activity is organized" (30).

the virtual/analog and abstract/concrete hybrids of climate change examination will become common.[14] The visual tendencies currently dominate our sense of self-situation and global understanding, but they articulate in how users "use" hardware and software. Manovich takes this use a step further, suggesting "we are no longer interfacing to a computer but to culture encoded in digital form" a "*cultural interface* to describe a human-computer-culture interface" (*Language of New Media* 69-70).[15]

Whether through cell phones, computers, global position systems, or television, a noticeable degree of mediation has come to underline human existence. Traffic and weather reports, for example, remove the necessity for direct human interface with the traffic or weather. Before walking outside the door I know how to dress (or prepare) for the day's weather and which streets to avoid. Human-computer mediation provides information that would be obtained in other manners, such as blindly driving into traffic or deciding the day's weather based upon stepping outside in the morning. As Manovich concludes, "[t]he computerization of culture gradually accomplishes similar transcoding in relation to all cultural categories and concepts. That is, cultural categories and concepts are substituted, on the level of meaning and/or language, by new ones that derive form the computer's ontology, epistemology, and pragmatics. New media thus acts as a forerunner of this more general process of cultural reconceptualization" (47). Because the human interface has changed, especially with the proliferation of personal computing, the study of human-technological connections becomes important. In his book, *Information Please*, Mark Poster "theoriz[es] the social and cultural

[14] In fact, many re-presentations of climate change are based upon colors signifying a warming trend or graphs with high peaks and low valleys to signify temperature change. Or more elaborate still, are the digital simulations that track climate from the past and project it into the future. Nevertheless, all three of these modes are highly dependent on visual identification as well as cultural norms that associate colors with temperatures and distance between points on a graph.

[15] Nicholas Negroponte has a similar assessment, claiming that digital technologies provided a shift from material objects (tangible) based in "atoms" to "bits" (intangible) in society (*Being Digital*). "Value" is based not on the material but on information. That is, a computer or television as "hardware" only has value (at least socially) with "software." Only when a user can do things with the object does it have value (Flew *New Media* 36).

effects of electronically mediated information" (back matter). Poster examines the relations of humans to information machines, noting that the relationship does not privilege one over the other but focuses on the structure of the interactions. As technology progresses, argues Poster, humans and machines appear in increasingly "complex couplings." Peter Lunenfeld contends that "it is the capacity of the electronic computer to encode a vast variety of information digitally that has given it such a central place within contemporary culture. As all manner of representational systems are recast as digital information, than all can be stored, accessed, and controlled by the same equipment. This is the true basis of the "multimedia revolution" (*The Digital Dialectic* xvi). In short, there is an interest in the cultural significance of the migration of information from humans to machines, the changes in the nature of information, the way information/technology mediates relationships and creates bonds between humans and machines, as well as the political implications that ensue.

Returning to the role of technology, especially digital media, in "seeing" climate change, it would be easy if we could transpose the scientific and technological advancements that will improve the situation to our cultural (and social, political,) understandings of the phenomenon. However, coming up with a cultural solution is perhaps more trying than implementing the scientific and technological solutions because implementing a "cultural fix" requires a shift in belief, attitude, and understanding, which are not necessarily required of technological fixes (different products) or social fixes (different laws, policies, etc.); cultural solutions require a change in our fundamental approaches, adding more discourses, and even removing taboos. Put another way, it is a change in how we talk about and perceive things (Layne "Cultural Fix"). Such dramatic changes are not required in social solutions and certainly not technological solutions.

Per Poster's point, technology, as part of and contributor to our daily lives, should be used to improve our understandings of our conditions and not be an excuse for our actions as if technology can erase our mistakes or fundamentally change us or our approaches. As Tom P.

Abeles explains, the complication comes when we think successful technology can be applied to social and cultural situations to the same successful results:

> The key issue here is the focus on the belief or faith that humans can measure [technological] factors and, by so doing, chart a course that will lead to best business practices and thus, in turn, a sustainable society. […] This idea is the latest manifestation of the belief that the logical and rational approach that has proved so successful in science and technology can be mapped onto the social and cultural spheres with the same manifestation of progress. (74)

Abeles is correct in pointing out the failure of mapping rational science and technology onto the cultural sphere. It alone cannot change culture nor can it stop global climate change; but, when understood as part of a larger process, the combination of technology and science can reveal a more holistic re-presentation of the natural world, a more "whole earth." The combination reveals interrelations, sub-perceptions, and, if we accept the technological revelations, a more material world. Yet, important to this consideration, as Don Ihde reminds us, is the ability to be "critically hermeneutic"; that is, reading the relations and influences between the cultural world (and its practices) and the material one. While not necessarily a solution, the combination of "right reading" (grappling with the articulations and material consequences) and "right technology" (acknowledging the re-presentations of the intelligible world in the meaning-making process) helps facilitate a more tangible connection to and better understandings of the material world ("Whole Earth Measurements," "Expanding Hermeneutics").[16]

1.4 Materiality

Bruno Latour argues in "Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," that a return to the Heideggarian "thing," allows a general consideration of

[16] Stewart Brand comments, "the better the technology and the more affluence leads to less harm—if that is the goal of the society" (134). The question, then, becomes one of "right technology" where less environmentally damaging technology is employed as well as an "affluence" (read as both wealth and material comfort) are available to a populace that *wants* to implement them.

objects and a more specific distinction of objects: a holistic as well as a contextual approach. In many ways, this is the type of materiality that I am considering in this project, a materiality that exists holistically as well as contextually. Language practices and digital technology make the "contextual" materiality intelligible within the larger holistic understanding of a materiality that is always already ongoing. Latour claims, "Things have become Things again; objects have reentered the arena, the Thing (arena), in which they have to be gathered first in order to exist later as what stands apart. Objects…out there, unconcerned with any parliament and forums, meeting places, where people debate" (237). Latour's statement directs materiality toward a general consideration of the objects "out there" while simultaneously acknowledging that those objects are disclosed through articulation "in here." We know there are "natural" storms; we know that there are political and economical ideas surrounding natural storms; these are the objects out there, gathered in the arena before they exist, not fixed, but recognizable, and for the moment categorical.[17] Specificities of these general objects (meanings, and material consequences) are then distinguished through articulations. As the example of Hurricane Katrina suggests, landscapes, peoples, and storms as well as the potential outcomes existed; however, "Hurricane Katrina," the tragic event that unfolded, gained meaning as specific articulations occurred, defining and re-defining landscapes, peoples, and storms through discourse and imagery. Hurricane Katrina "out there" and "in here," to use Latour's terms, were different, yet some of the categorical considerations were maintained even though definitions of them may have changed. The event made it clear how wrapped up in social, cultural, political, technological, and economic factors the material world is. Climate change has many of the similar consideration as Katrina, only at times the phenomenon can be a bit more abstract.

[17] These objects are independent in categorization and recognition only, never in happening. The happening and materiality is the focus of chapter 2 in which I attempt to define the articulation of materiality within a process but also "the things themselves," which have identity while performing within the process.

It is not enough in the current climate of real time digital applications and specialized discursive structures to rest simply and comfortably on materiality as "matter," as a static object that conforms to physical and scientific properties. Instead, as Diana Coole and Smantha Frost contend, materiality "is always something more than 'mere' matter: an excess, force, vitality, relationality, or difference that renders matter active, self-creative, productive, unpredictable" (9). Materialtiy, in their definition is far better understood and productive as an "active verb" that challenges us to better address the agency and place of the natural world.

Material articulations of language and technology recognize categories and distinctions *only* as a means of approaching the intra-actions of these "categories." While theoretically materiality seems transcendent (the material world and material agency, for example) a material intra-action does not transcend time, space, or culture, but may stand as a category in *theory* only as a means of approaching other material intra-actions. In other words, "universals" exist materially only to the extent that they facilitate engagement with moments of articulation. "The universal is not total," argues Pierre Lévy, "[t]he 'total' is information and meaning that crosses time, culture, and contexts to provide a stable understanding/interpretation of what the total means" (*Cyberculture* 97). In this quote, Lévy discusses Cyberspace's ability to constantly renew and vary meanings, shedding a totalizing and transcendental signifier. For him, "[t]he universal does not totalize through meaning: it unites us through contact and general interaction" (*Cyberculture* 99). Likewise, materiality "universalizes" the existence of a diverse material, often intelligible world that is connected to human actions. Like the universality that Lévy argues for, the materiality of this project is very contextual, an in-the-moment articulation of "things" as it unites human and nonhuman considerations with the larger scope of materiality.

The concern in this dissertation project is not the existence of the material, but how language and technology mediate our embodied connections with the material world. Moreover, how individuals understand this connection becomes as important to environmental issues as recognizing the connections (how people are connected is as important as knowing they are

connected). Bill McKibben argues for the end of nature, the extinction of a pristine or untouched planet. For McKibben, humans are always connected to the planet, even more so because of human activities and alterations of the planet that have narrowed any distance between human and nonhuman worlds. Taking McKibben's idea a step further, Lèvy argues that the natural and technological worlds are continually intertwining:

> the biosphere is today and will be in the future more and more a technobiosphere. A bigger part of the earth's surface is modified by agriculture, livestock farming and urbanization. Marine and earthly ecosystems carry the ever growing weight of human intervention. Man's activities have already affected in sensible ways the atmosphere, its composition, its temperature with all the repercussions on all forms of life that we can imagine. With biotechnologies, we rapidly create new species of plants and animals but also new ecosystems, creation on which we have lesser control. ("Meta Evolution")

Human-technological intervention, such as seed patents, gene splicing in livestock and plant crops, and other highly modified objects has become the norm. So much so that labels like "organic" and "non-GMO" are attached to food, ironic considering that at one time all plant (and animal) matter was organic and not genetically modified, at least to the extent and degree that techno-science is currently modifying plants and animals. Certainly nothing new, the cultivation and breeding of plants and animals has been occurring since the earliest agrarian days. However, today, with the ease and ubiquitous application of technology, the material connections are often subdued or overlooked. The problem comes, then, from how the obfuscation and over- representation—intentionally or not—clouds the material world. Difficulties often arise in the "translation" of material agencies to human terms.[18] For example,

[18] I recognize the problem and potential to explain in much more detail the idea of agency and the nonhuman world. However, as I will explain in more detail in chapter 2, agency, as used here, is the recognition that the nonhuman world "acts" in a manner that establishes its co-constitutive existence with and influence on the human world. Again, while not given the same

the uncertainty in accurately and consistently translating 20emiotic20gical cycles over the last century (let alone thousands, millions, and billions of years) into human understanding (especially for laypersons), casts a large and inescapable shadow over environmental actions to keep climate change in check. As I will explain in chapters 2 and 4 on materiality and digital technology, the coding and transference process, while not a guarantee for clarity, meaning, or understanding, is a material intra-action within the process of meaning-making. Objects are not the "same"; however, as Bruno Latour argues, they maintain similar properties that identify them as a part of the material process (*Pandora's Hope*). In chapter 4, on technology and *digital materiality*, I describe how recent technological advancements and "real-time" translations produce a "re-presentation" in which the material world is an active participant in shaping our mediated view.

The material world exists; it is not *only* accessible through language and technology. The material world does have agency and intra-acts with the human world. But, as the above examples of Katrina and The Global Earth Observations System of Systems (GEOSS) illustrate, human connections with the environment are becoming increasingly dependent on technology and technological re-presentations; perhaps more importantly, people want more certainty in predicting the future of climate, traffic, and other daily run-ins that too frequently become hassles. Climate change, whether natural or man-made, is re-presented by technological means; otherwise, it (or its severity) is hardly measurable. Though one can anecdotally claim that one summer is much warmer than another summer, the longevity and immediacy of climate change and its effects are not completely measurable through direct experience.

1.5 A Mixed Reality of Context

In November of 2007, the Intergovernmental Panel on Climate Change (IPCC) released the fourth assessment report (AR4), which updated and continued research from the group's

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philosophical and existential qualities of "agency" that are debated in the human condition, the nonhuman world acts, and these actions have impacts on the human world.

previous reports.[19] The report concluded that climate change was all but fact. The AR4 considers that the "[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures [and the] widespread melting of snow and ice and rising global sea levels" (2). These measurable effects of climate change are part of the larger materiality of climate change that includes cultural issues; however, the report does not provide a more inclusive comprehension of climate change that includes cultural implications.

Put simply, climate change is a cultural issue and concern. Though science provides some of the solutions, the world populations cannot hope to address the phenomena of climate change without addressing the cultural implications of/on climate change.[20] Latour critiques the notion of forming divisive categories. "We are the only ones," he claims, "who differentiate absolutely between Nature and Culture, between Science and Society, whereas in our eyes all the others…cannot really separate what is knowledge from what is Society, what is sign from what is thing" (*Modern* 99). Latour's observation suggests a more inclusive treatment of traditionally one-sided issues. For example, scientific "facts," which reveal the extent to which

[19] Established in 1988, the IPCC is a governing body that "review[s] and assess[es] the published scientific literature on climate change, its costs, impacts and possible policy responses. It also plays a role in assessing scientific and technical issues for the UN Framework Convention on Climate Change…it attempts to reach a consensus view on the scientific aspects of global climate change as this is seen as necessary for obtaining policy decisions that are based on best available knowledge" (Grundmann 415). I have included the IPCC descriptions of global warming because the institution has a great deal of credibility within climate change movement (it is cited frequently) as well as a broad, global reach (it is a "world" organization and publishes in many languages. It, perhaps, presents one of the most cosmopolitan assessments of global climate change).

[20] This statement is a simplistic detailing of the larger thesis of the project, which claims that uniquely one-sided approaches to the environment ultimately prevent the solutions to environmental issues. Though humans are *part* of the environment, they undoubtedly approach it form an anthropogenic point of view. Humans cannot speak or conduct themselves *as* nature and must, therefore, adopt a more inclusive, holistic understanding and approach to the nonhuman world. While media such as language and technology, specifically media such as television, film, and the internet, complicate the connections between the human and non-human worlds because of the tendency to distance the two to a point of "observer and observed" and "omniscient and subject/object" to name a few, they also stand as powerful tools to incorporate a broader, more inclusive view of the nonhuman and human worlds and provide more intelligibility.

the planet is in jeopardy, are hardly palatable without a broad cultural acceptance from a larger public audience; and, vice-versa, without the foundation of science, public outcry receives little attention.[21] Our cultural convictions (most dominantly rooted in global capitalism) influence and, largely, dictate our approaches to the world.[22,23] In the case of climate change, this view becomes a problem when cultural norms defy scientific discovery. As Ulrich Beck explains, "Scientific rationality without social reality remains empty, but social rationality without scientific rationality remains blind" (*Risk Society* 30). Although Beck's statement does not address the larger cultural implications, it does imply a recursive dependency between public acceptance and the "persona" of scientific facts. He further claims "knowledge of cultural sensitivities is just as significant for this work as are courage and objective knowledge" (*Ecological* 15). This statement suggests that cultural experience provides a means of knowledge formation as much as objective science, or at least can become a deciding factor in knowledge formation.

Cultural experience and scientific rationality are subjects in Mark Lynas' 2004 book, *High Tide: The Truth about Our Climate Crisis*. A solid example of the blending of public and scientific that Beck describes, Lynas travels over some five continents in order to interview laypersons and scientists alike, attempting to discover the "fingerprints" of climate change, proof that he readily admits was "too abstract" (xxix). Throughout Lynas' journey, he is faced with stories that echo the scientific proof of how certain climates, weathers, and geographies have changed. For the author, while based in scientific fact and data, his exploration was about

[21] Unfortunately, environmental issues are often addressed (from both sides of the aisle) from a more pathos and ethos driven point of view. Science quickly takes a back seat to arguments that evoke heavy emotions or those that are given by a familiar or popular persona. While not the complete focus of chapter 3 on language, I will briefly cover these rhetorical moves.

[22] While whole projects could be (and should be) devoted to the question of "cultural", specifically when dealing with global, environmental issues, which automatically assumes multiple cultures, I am concerned with the cultural convictions that champion the "good life" of consumption and "nature-as-resource." These views "other" the nonhuman world and leave it open to exploitation without question.

[23] For a more detailed examination, consider Lawrence Grossberg's "mattering maps," a phrase adapted from Rebecca Goldstein, which address our "cognitive connections with cultural formations [and] *affective* investments in them, investments of emotion and feeling (Littler 232).

discovering a part of humanity that would ignore science and experience in the face of radically changing climate. Put another way, Beck's assertions and Lynas's examples indicate that without the unification of science and public, perceptions of climate change are left incomplete. This unity, and the quotidianization of science (through technology and public discourse) have helped spur the modern environmental movement against climate change. Analyzing the film *An Inconvenient Truth*, Thomas Rosteck and Thomas S. Frentz contend that the narrative of the documentary "humanizes the sciences" and "science legitimates the narrative" ("Myth and Multiple Readings" 12). The authors claim that by depicting Gore as a "hero" and stressing the trial and tribulations of his life, the audience transcends the mundane science of the argument and connects with the human condition of a planet in peril.[24]

To be sure, the science behind the warming planet has been all but confirmed. Whether the phenomenon is caused by predominately human or non-human factors or a combination of the two, most scientists as well as the public agree that the planet is warming. As with the science of climate change, the steps to reduce the amount of green houses gases in the atmosphere are firmly established. From reducing the dependency on fossil fuels to restoring natural vegetation, science has demonstrated what needs to be done to slow the warming trend, including drastically restructure the hyper-consumer lifestyle. Yet, herein lies the problem, though the science of global warming—i.e., that the planet is warming—has been soundly established, the cultural implications of such a change are often overlooked, though always implied, within the diagnosis. I want to redirect the focus of the dissertation to the cultural

[24] In this example, we see a translation of discourse, from the scientific to the public. Like the material translations I mentioned briefly (and I will address more substantially in chapter 3), the translation of discourse attempts to maintain some of the identifying properties (scientific terms, for example), but translates them into something more recognizable (and perhaps useful) to the audience. Whatever identifying properties of "science" are lost in the translation, there remains a degree of consistency as well as the chance that the properties will regain identity through new avenues of expression and new uses of the discourse as well as more familiarity that the public can grasp.

current that stands as a treacherous undertow to the recognition of climate change as well as to material connections between humans and the world.

1.6 The Cultural Conundrum

A 2008 poll from the Pew Research Center indicated that roughly 60% of Americans polled felt that major sacrifices, not technological advancements, are necessary to stop climate change ("Partisan Divide" 3). However, in spite of this belief, the response to the phenomenon of climate change is quite low. A 2009 Gallup Poll suggested that about 41% of those sampled claim that global warming is exaggerated, compared to about 30% in a 2006 survey ("Global Warming 'Exaggerated'", "Global Warming Worries"). A 2009 Gallup poll also demonstrated that of major environmental concerns—water and air pollution, toxic contamination loss of biodiversity—global warming ranked last ("Global Warming 'Exaggerated'" 6).[25] Even as a more "environmentally-friendly" administration took the oval office, public concern for climate change and other environmental troubles rank astonishingly low ("Policy Priorities"). In short, these polls and others like them reveal that the overall concern about climate change—taken broadly—is not at the critical mass it needs to be in order to actually solve the problem. The polls also suggest that, in spite of overwhelming scientific evidence that climate change is happening, by

[25] On a positive note, however, the poll suggests a need to broaden considerations of the phenomenon to include concerns that traditionally fit with/in the Environmental Justice lens. If one approaches the phenomenon from an angle of class and capital, the discrepancy between the sources of emissions becomes more apparent than if one is to approach climate change from a perspective of geography and/or region, i.e, through science and technology. The examination reveals that the wealthiest percentages of people emit more CO_2 than the equivalent percentages of poor people (Baer qtd in Barnett 3). Nevertheless, as Beck and other critics argue, the poor tend to suffer a disproportionate amount from the effects of emissions than their wealthy counterparts (*Risk Society* 41-44). Global warming is a "global justice problem," one that reaches through the biological implications and into our political, economical, social, and most significantly, our cultural beliefs and actions (Adger et al. qtd in Barnett 3). One suggestion is to measure "wealth" in cultural affluence (community, meaningful relationships, connections to the environment), thereby uprooting the notion of wealth as monetary affluence anchored to Consumption. Global justice for environmental and social problems will never be corrected if to "have more" is the measure of the "good life." Because, in the end, socioeconomic systems will have to adapt to the loss of and strain on ecosystems on which they depend (Barnett 2 – 3).

and large the phenomenon is not a pressing cultural concern. Scientists do not deny the complexity of climate change as well as absolute accuracy of its potential effects; however, scientists and the supporting data have for many years provided substantial proof of its existence, but by and large the public has ignored the data or remained cynical about its ability to do anything to stop a warming planet; as Peter Sloterdijk argues, "[t]o act against better knowledge is today the global situation in the superstructure…" (6).

Sloterdijk's criticism against "enlightenment philosophy" is worth noting. For Sloterdijk the enlightened consciousness saw through the "false" ideas, lies, errors, and ideologies, bestowing upon the individual the insight and understanding to act. An enlightened consciousness produced awareness and rationality. However, as Sloterdijk argues, the enlightenment philosophy actually initiated an "enlightened false consciousness" ("Cynicism" 192); which in spite of being rational, does not produce the "changes" enlightenment philosophy envisioned. The "reality" of the current environmental situation (among other political and social situations) challenges the enlightened individual to act against many of the "falsities" that enlightenment unveiled. Bound by an irreversible consciousness that exemplifies the wrongs of a situation and the inability to act, the cynic, continues Sloterdijk, acts "against [his or her] better knowledge" (193-94). There is no false consciousness, no illusions, yet, the cynic is "dragged down by the 'power of things' (193) and/or chooses not to act because the cynic feels he or she has no power to enact change. In a similar explanation, Slavoj Žižek writes:

> The illusion is not on the side of knowledge, it is already on the side of reality itself, of what the people are doing. What they do not know is that their social reality itself, their activity, is guided by and illusion […]. What they overlook, what they misrecognize, is not the reality but the illusion which is structuring their reality, their real social activity. They know very well how things are, but still they are doing it as if they did not know. (32)

Sloterdijk and Žižek address a very important seed of approaches to environmental issues, and while not addressed at length in the project, is in fact part of a dangerous undertow that constantly pulls on positive environmental changes. As much as this dissertation project advocates and analyzes more inclusive and material approaches to nonhuman/human connections the cynical, helpless, and dismissive responses to environmental issues will always present themselves.

Although not definitive, Spencer R. Weart's *The Discovery of Global Warming* recounts the converging trajectories of science and culture throughout the early forays into the study of climate change, from 1896 – 2001 by Weart's account. Until recently, much of the exploration and discussion of climate change was undertaken as a "hobby" by lay scientists interested in climate. The "invisibility" of climate change and the staggering number of scientific disciplines necessary for its study made claims about a warming planet difficult to believe for most people. Moreover, a cultural perception existed that nature was perpetually in balance and beyond human influence. The belief of a "suprahuman" planet furthered the difficulty of proving climate change (8).[26] As the years passed, science became more certain about the existence and severity of climate change, but not without much debate, doubt, and dissidence. Weart argues that by the end of the first decade of the 21st century, science had concluded that the planet was warming. Much of what was hypothesized or known had been proven and strongly supported. As the science behind climate change became conclusive, the emphasis shifted to the public and policy makers. Although it is debatable how far science has gone to incorporate itself into the public (and vice versa), global climate change has forced both scientific and public spheres

[26] Also worth adding, Weart notes that climate change examination has taken off dramatically in the last 30 years, since about 1980 (*Discovery of Global Warming*). The development and growth of cable television, satellite technology, and meteorology increased the public's view of the planet from local to global and produced climate and planet- specific media outlets such as the Weather Channel. In other words, in the 1980's and beyond, as global climate change was becoming a more serious discussion, so too were media for sharing the discussion and giving persons a broader point of reference. Visual and tracking technology become more common and accessible. (See Marita Sturken "Desiring the Weather" for an analysis of media and weather.)

to pay attention to what the other says.[27] Science Study scholars have long argued about the split between scientific and public discourse and laboratory and experiential science (See Latour, Lyotard, Beck, and Haraway, for example). Because of large-scale implications, i.e., potential global destruction, both spheres have been forced into an inclusive acknowledgement of the other and how they must work together, but the work is arduous and continues. As laboratory scientists predict the parts-per-million of CO_2, citizens voice their experience of a warming planet from different regions of the globe. And, in many cases, technology has provided the bridge between the two.

Andrew Szasz has argued that "[A]mericans and cultures have been apathetic to climate change," in spite of widely acknowledging the problem (*Shopping* 220). In his book *Shopping Our Way to Safety: How We Changed from Protecting the Environment to Protecting Ourselves*, Szasz examines the "mental splitting" or "compartmentalization" of knowing the gravity of the issue while not acknowledging (or accepting) the reality of it. The response, according to Szasz, is one in which people attempt to remove themselves from the situation while not recognizing that they are in fact still very much embedded in it. Szasz coins the term "inverted quarantine" to explain how people voluntarily isolate themselves from the situation, a "commodified response to risk," while simultaneously making it worse, although not aware of doing so (44). Unlike traditional definitions of "quarantine," the environment (not an individual) is toxic, and by removing oneself from the environment through various products one becomes safe. Ultimately, there is the sense that one no longer has to think about the problem because it has been solved (201), at least at the individual level. Szasz critiques the bottled water industry and people's attempts to avoid contaminated water while not recognizing the environmental

[27] Worth noting, but beyond the scope of this project, is how critics (or skeptics) view the split in political terms. That is, scientific and cultural receptions of global climate change have an innate tendency to become political when data and experience bring into question specific trends, such as coal burning power plants that could be stopped. Many environmental justice cases become less of a purist split of science and culture and more of a split of political power. In these cases, science participates, frequently, on both sides of the rift.

implications of the processing of bottled water or the problems of contaminated bottles and water. This response, according to Szasz, has serious consequences because it forwards a "political anesthesia" in which it reduces the sense (and materiality) of urgency, undermines the ability to reform environmental problems by producing a "false sense of security" (202). While protecting the individual body, what is lost is the communal ability to organize and politicize. While there are certainly discrepancies between degrees of awareness and acknowledgement, Szasz, like Sloterdijk, contends that personal and public attitudes undermine progress by individuals' refusing to participate in change while understanding that their actions contribute on some level to the cause. The irony, while perhaps in the future, stands that whatever environmental degradation occurs will eventually affect large populations. Thus, removing oneself from the problem via an inverted quarantine or an unwillingness to put into practice an understanding of change within the situation really is consensual participation in the problem.

Sloterdijk and Szasz address cultural norms that are lodged between unwillingness to change and willingness for personal protection while problems continue to grow. This view, suggests Charles Taylor, is based upon an awareness of societal practices and how people see themselves fitting together within the practices and other normative factors ("Modern Social Imaginaries" 91, 106). Taylor uses the term "social imaginary" as "[t]hat common understanding that makes possible common practices and a widely shared sense of legitimacy" (106). Social imaginary carries with it a set of expectations and norms of the collected social life, how things fit together, and how things should work together (106).

Returning to the bottled water example, consumers avoid contamination by drinking bottled water or knowingly contribute to contamination. The Szaszian/Sloterdijkian social imaginary, a common approach, undermines local, state, national, and global water issues such as having clean, potable, and abundant water or the planetary cost of bottled-water production. Defining a social imaginary that takes into account basic water issues could expose the normative practices that actually further more environmental problems. There is, according to

Sloterdijk, an “inversion” in the idea that learning will produce a richer life, that things will improve; rather, it stands that often times they may get worse (xxix). The practices in which we engage, according to a theory of social imaginary, indicate how we “understand,” or at least what we accept to be the situation and normative practices, not looking the other way, but looking directly at the problem while reaching for another bottle. In other words, buying bottled water is a socially acceptable practice that we participate in as a means of avoiding contaminated water or refusing to act accordingly against the consequences. It is an act in which we think we have a “sense of our whole predicament in time and space, among others and in history” (Taylor 107, 109), but (fail to) realize that we are omitting large, significant portions of the predicament that have significant repercussions. A personal social imaginary overshadows a communal social imaginary, which is the underlying problem Szasz expresses in the inverted quarantine:

> Inverted quarantine is implicitly based on denial of complexity and interdependence. It mistakenly reduces the question of an individual’s well-being to nothing more than the maintenance of the integrity of the individual’s body. But in the modern world a person’s well-being cannot be reduced to preservation of the person’s body alone. Each person’s well-being requires in our age that somewhere else in the world innumerable other people grow that person’s food, manufacture the goods he uses, and help make all the organizations he depends on continue to function day to day. All that, in turn, requires that human societies engage in successful, more or less stable exchanges with the natural environment. (222)

Szasz’ statement suggests the need to look as broadly as possible into global considerations. A more global perspective chips away at myopic views that, whether consciously or not, negatively impact the environment. Broader views give a bigger picture, which ideally leads to new practices (Taylor 11). Although bottled water use is still an environmental problem, the

social imaginary surrounding it have changed from the time of Szasz' writing. Persons at large are more aware of the problems of bottled water (resources, waste, water quality,) and its consumption has declined. Moreover, many bottled water companies have introduced more environmentally friendly bottles (less and recycled plastic), urged recycling, donated money to environmental campaigns, and generally attempted to "offset" the problems of bottled water.[28] In Taylor's terms, the social imaginary shifted, forming a new set of actions and practices (111). In both examples, changing the social imaginary and overcoming an inverted quarantine or cynicism is not possible without a more global view, whether the view is in fact global in the literal sense, or it simply goes beyond one's comfort zone.[29]

Although the global approach has limits, as a means of considering environmental phenomenon such as global warming, a "cosmopolitanism" view, to use Ursula Heise's term, is an imperative by which to address global concerns (and by extension local concerns).[30] In

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[28] As the cycle continues (although improving, but continuing nevertheless), there has been dramatic shift from bottled water to "water bottles," which alleviated some of the bottled water problems but introduced a new set of problems like Bisphenol A, commonly known as BPA. Again, there was a commonly accepted practice, "Buy plastic bottles, not bottled water," which came under scrutiny and was later changed. Here cynicism and an inverted quarantine and the social imaginary change, resulting in an ongoing attempt to find solutions to environmental problems. Finally, in both examples, the narrow views were replaced by broader views that took into account the person, the object, the practice, material consequences and how all fit within a broader world-view.

[29] Worth noting when talking about social imaginary, inverted quarantine, cynicism, and many environmental issues, is that to a certain degree one's social imaginary, ability to be invertedly quarantined, and cynicism depends largely on one's class and/or social status. I am thinking of Pierre Bourdieu's idea of "capital" and "habitus" that essentially describes one's interactions through language as relegated to the power structure. While, for the most part, bottled water can be inexpensive, economic class influences amount, type, and brand of bottled water. Moreover, according to Bourdieu, people have certain dispositions that account for their actions within the power structure. Again, these dispositions are specific to certain social contexts and settings. Bourdieu's argument translates to the gap between science and lay persons as the public finds themselves more apt to invest in scientific responses because science, especially for environmental concerns, holds a great deal of power. See *Language and Symbolic Power*.

[30] I am thinking specifically of how indigenous groups are fighting against the global and are attempting to re-establish their local practices, even if that means exporting them globally. Nevertheless, local, place-based approaches are important to indigenous culture. As Danny Butt suggests in the introduction of *Place: Local Knowledge and New Media Practices*, "home" is a location and not an abstraction. In other words, although Butt acknowledges the problematic definitions of local knowledge (indigenous versus settler knowledge), the

Sense of Place and Sense of Planet: The Environmental Imagination of the Global, Heise describes the need for American environmentalism to move away from environmental approaches that champion the local over the global. For Heise, local approaches are limited because they do not address the larger environmental picture, nor do they forward a broader cultural perspective of the environment. She uses the term *cosmopolitanism* to explain how environmentalism can move beyond local and national levels (21). Cosmopolitanism accounts for how individuals become de- and re-territorialized through the globality that most people experience in their daily lives. Again, for Heise, these territorializations are not necessarily negative; rather, they are indicative of a more "worldly" connection. Heise states, "[i]n a context of rapidly increasing connections around the globe, what is crucial for ecological awareness and environmental ethics is arguably not so much a sense of places as a sense of planet—a sense of how political, economic, technological, social, cultural, and ecological networks shape daily routines" (55). Heise argues for a reorientation of how "both local cultural and ecological systems are imbricated in global ones," providing "a shorthand for a cultural and political understanding that allows individuals to think beyond the boundaries of [one's] own cultures, ethnicities, or nations to a range of other sociocultural frameworks" (59, 60).

Heise's cosmopolitan framework bridges the disconnect between individual, communal, and global perceptions and seeks to align identification of micro- and macro-scale environmental issues that will potentially lead to the dissolve of boundaries and to action. Ulrich Beck frames the problem as the willingness of cultures to perceive environmental damage based on cultural norms (*Ecological* 124). Cultural institutions decide what is in danger by the threat to the "cultural design of nature" (125), which is determined by a cultural majority. Like

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knowledge formation comes down to the re-establishment of local indigenous practices and knowledge. Moreover, there still exists a degree of acclimatization by the individual to the other cultures/practices. If it were as simple as recognizing and being familiar with other cultural approaches, there wouldn't be much of a problem. But one has to appropriate or be appropriated by those cultures, or at least a part of them in order for a change to occur.

Szasz, Beck argues that the cultural perceptions of the environment do not accord with the material degradation or looming catastrophe that are directly within our lived experiences, or worse, as Sloterdijk contends, people are well aware of the situation but refuse to act.

1.7 Media Influence

Cultural perceptions of many issues are obviously strongly influenced by media portrayal and coverage. Anyone who follows the portrayal of climate change in the media with a degree of attention (and skepticism) recognizes the discrepancies between networks and the problem of "objective" reporting on a topic that has been confirmed through numerous studies.[31] Moreover, reports on climate change are often relegated to the environmental section with issues that have less global implications (saving the spotted owl, for example) when climate change clearly has much broader, significant repercussions on the human and nonhuman worlds. Critics argue that, in spite of the overwhelming support from the scientific community over climate change, "television news coverage of anthropogenic climate change actually perpetrates an informational bias by significantly diverging from the consensus view in climate science" (Boykoff 3).[32] Accordingly, the conflation of such scientific findings, not a clarification, influences U.S. policies and, I would add, individual policies, or better, cultural norms (8).

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[31] Maxwell T. Boykoff and Jules M. Boykoff's 2004 article "Balance as Bias: Global Warming and the U.S. Prestige Press," contends that balanced reporting in the media causes a rift between popular and scientific discourse by allowing climate change denialists equal coverage with the scientific data that confirms a warming planet. The authors also stress the need for better reporting as most of the public's scientific exposure to climate change comes through the popular press. Maxwell T. Boykoff has a similar premise in a 2007 article in which he examines popular television news coverage, arguing media coverage "has perpetrated an informational bias by significantly diverging from the consensus view in climate science that humans contribute to climate change" (1). *Grist*, a popular environmental journal also critiques "objective" reporting by the media, targeting the *New York Times* specifically. See *Grist*'s 23 Feb 2009 article: "Et tu, *NYT*?," in which Joseph Romm laments the *NYT*'s omission of details tying human influence and climate change by either omitting information, explaining the happenings at the hand of nature, or framing the discourse in a way that strongly favors one side of the issue.

[32]A similar argument is made by Reiner Grundmann in his essay "Climate Change and Knowledge Politics" (2007). Grundmann argues that there are no "uncontested truths that are translated into policies." He assumes a "co-production of scientific claims, political decisions and

One of the major problems with mass media sources like television and newspapers are the one-sided, top-down systems of investigation and reporting. A select few within the media organizations have the power to dictate the content, providing little room for objection. Ulrich Beck notes that a tension develops between those with power and those without. With this tension comes the growing importance of "social and economic knowledge" about the issue and "the power over the media to structure knowledge and disseminate it" (*Risk* 46). For Beck, "new antagonisms open up between those who produces […] definitions and those who consume them" (46), meaning how knowledge is controlled is as important as the knowledge. This control is more easily accomplished through media such as television and newspapers that are structured from the top down. In fact, a critic refers to the time period of 1995 – 2004 as "the lost decade" of U.S. television news coverage of anthropogenic climate change because of the reporting, which overwhelmingly mitigated the human influence on climate. Although the previous decade may have been a loss for drawing attention to the human influence on climate change, currently the internet has been receiving attention for providing a more grassroots and widespread medium for examining global warming. Global warming activists have lauded the potential for more collaboration and involvement from more sources brought with the internet. The following decade could easily become the "found decade" of news coverage of anthropogenic climate change coverage because of the internet.

Cultural perceptions and attitudes are best viewed in popular culture, especially advertisements and film. While the advertising world has and will always attempt to capitalize on popular, cultural movements, ads for products that use an environmental approach often take on a degree of confusion and hypocrisy. In a 2007 ad campaign by the Diesel clothing company, images of models in a post-climate change world—areas of radically altered

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social order;" nevertheless, Grundmann is quick to point out that "scientific proficiency does not correlate with political leadership" (414, 423). (As with Beck, Latour, Haraway, and Pickering to name a few, there are not rigid borders separating science and social and public policy, and yet, there is a weighted distinction in the implementation and execution of decisions that favors one over the other.)

geographies—show lavish lifestyles, smug acceptance, and give a silent nod to a better world after radical climate change:

Figure 1.1. Diesel Clothing campaign using a post-climate change world as the backdrop to advertise clothing and a lifestyle.

The campaign's slogan is "Global Warming Ready," which implies that the company has accepted climate change and is preparing for it accordingly. In many ways, they are accepting the outcome and not working to change it. Or, per Szasz, consumers (via models) are preparing themselves while knowingly (or not) participating in those practices that further climate change (consumption namely, but also denial and blind acceptance). The normal conventions of (sub)liminal advertising hold: sex, power, style, and so on, but what changes is the additional message of "business as usual" in a radically altered world. Diesel presents fashion that considers climate change as a setting, a consideration to weigh as one would when going to the park, beach, or a day out on the town. Per Sloterdijk's critique, the advertisement projects a notion of acceptance of actions as well as an acceptance that "this is how things are," so why

should anyone change? Climate change, as meaning, is relegated to another "backdrop" from which humans continue their (very fashionable) lives.

The 2006 film, *An Inconvenient Truth,* relies on similar rhetorical and cultural conventions to express its message. While certainly there are considerable discrepancies between the Diesel ads and the film, both structure their approaches in a way that appeals to cultural sensitivities toward climate change; nevertheless, for Diesel the cultural norm is acceptance, moving on, and having fun. For *An Inconvenient Truth* the cultural norm is stressed to the point of change, the goal is to radically alter our approaches to the environment and each other. For example, the trailer for the film (like most trailers) capitalizes on emotion, provocative language and imagery that questions the audience's values and feelings for the world, suggests a battered planet:

Figure 1.2. Opening credits for *An Inconvenient Truth*. The rhetoric questions and interpolates the audience, attempting to force action.

Language is articulated in two ways in figure 1.2. First, the rhetorical choice to question and confront the audience about their "love" of planet and child brings with it significant material considerations and consequences as the audience associates the potential damage climate change has on their "loves." As Maxwell T. Boykoff argues, "People deal with climate-related

challenges in their material lives through their ability to meet livelihood needs, and in their social and discursive spaces in terms of how considerations for climate action are meaningful" ("Lost in Translation" 92). Moreover, the language of figure 1.2 personalizes the fight against climate change by calling out each audience member, harkening them with "you." In his Book *Ecopopulism*, Andrew Szasz states that television news broadcasts tend to "personalize" and "dramatize" issues rather than explain their complexity directly (61). *An Inconvenient Truth* performs a similar action by suggesting that the materiality of climate change is the consequences it will potentially have on "children" and "planet," hoping that the audience can imagine a child and something of the planet they hold near and dear.

An Inconvenient Truth also employs visual, presumably scientific data and familiar imagery to further sway cultural perceptions by illustrating a read line of increasing temperature on top of a gritty, smoldering image of a large metropolitan city:

Figure 1.3. Screen image from the opening credits of *An Inconvenient Truth* depicting temperature rise juxtaposed on top of a gritty, oppressive image of a city.

The juxtaposition of images is a means of injecting (more recognizable) science and a recognizable, startling image, which, argues Finis Dunaway, is a way to introduce pathos into politics and shape public attitudes about the environment and, perhaps more significantly, defining the natural world (*Natural Visions)*. *An Inconvenient Truth*, and to a lesser extent Diesel, interfaces speakers, images, messages, and audience with the goal to make meaning out of material and potential associations, a mediated environment, and cultural perceptions. The interface complicates, but does not supplant, "non-mediated" approaches to the climate change that suggest the planet is not warming as drastically or consistently as experts argue (Best 72). Moreover, *An Inconvenient Truth* exhibits an overt effort to associate climate change with the loss of human and cultural institutions, perhaps more so than as a loss of the environment. Figure 1.2 and 1.3, capitalize on pathos and a logic founded in human emotion and personal association as a means of forcing the issue of climate change into the cultural

arena, which Szasz suggests is the only way in which people connect to and form opinions about complex environmental and social issues (*Ecopopulism* 64). Or, put another way, the attempt is to solicit more familiarity toward a fairly abstract phenomenon empowering action and a change of attitude in the lives of the audience (Best 78). Thus, the goal for both *An Inconvenient Truth* and Diesel is to stress the alteration of personal, cultural lives above and beyond ecology. Meaning, understanding, and materiality are cultural and environmental, but only insofar as the audience can associate their lives within or against the environment. The point, while capitalizing on certain rhetorical and image structures, stands that the presentation given by the documentary *is* part of the relationship between the natural and cultural worlds; not a stand-in (Best 78), but rather, a material relationship that defines climate change through cultural approaches and associations. Not unlike Diesel's ad campaign, *An Inconvenient Truth* pushes a definition of climate change that forces audiences to recognize that the planet and, more significantly, *their lives* will change through loss, or, in Diesel's case… maybe not.

Recognition (or better admission) and intelligibility prove a difficult process as scientific discovery and cultural perspectives must be somewhat aligned for nature/culture receptions to be in concert. This alignment is the attempt in figure 1.3 and to a less obvious extent figure 1.2. Both images align generalized scientific discovery—natural loss—and cultural receptions—cultural loss. According to Richard Grusin:

> the moment of discovery according to a logic of fidelity to nature in which the scientist must accurately and exactly represent nature at the same time that he must reproduce nature according to a set of prior commitments, interests, and practices. [The person then] stages knowledge or representation according to a narrative of visual discovery in which the scientist comes upon something that has never been come upon before (75 – 76). [33]

[33] In *The Postmodern Condition*, Lyotard examines the, at the time, current state of knowledge formation and access, or the "legitimation of knowledge." While writing the book, Lyotard was

Although there must be some accordance between views of nature and culture and scientific discovery, natural/cultural/scientific views do not have to be far apart. According to Stewart Brand, culture occupies the slower end of the representational scale he calls, "The Clock of the Long Now." Brand posits six significant levels of pace and size, which from "fastest to the slowest," are art/fashion, commerce, infrastructure, governance, culture, and nature. Art/fashion and commerce are quick-paced and volatile. What is successful in one year, even one season in a year, does not necessarily hold (adding to the irony of the fashion industry's attempts to protest climate change). Thus, for the ecological and cultural sake of the planet, we need to realize that we cannot accurately predict the future so we must be more responsible for the present.[34] In addition, we can give the future the tools and a position from which to work as the moment reaches the present (*Clock* 188, 123). As Szasz remarks, "The gap between predictions of future catastrophe and people's actual experience—that things are evidently not falling apart now—is too great" (*Shopping* 221). Culture must be situated as a sustained, not temperamental endeavor. Culture is where Brand's "long now" operates because its slow progression keeps century and millennial time. Culture is the collective work of groups of peoples, and may stand as the place where solutions to climate change operate because 1)

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aware of the techno, computer data that was becoming common. Computers, he thought, would allow ease of and widespread access to knowledge. In other words, computerized knowledge must be considered legitimate, and whatever principle society uses to legitimate knowledge must also be the principle that it uses to legitimate decision-making in society (and government.). Though hardly contested, computer-generated knowledge from valid sources (NASA, Union of Concerned Scientists) becomes a legitimate foundation for making decisions concerning global warming. Lyotard's claim and recognition of narrative knowledge open the door for the legitimation of knowledge coming from local accounts and individuals. It goes without saying, then, that much of the information circulating is not direct, first-hand information in the traditional scientific sense; it is information about information.

[34] A similar assessment is posited by Robert Markley who states, "[c]limatological knowledge […] is always a function of networks of observers, technologies of measurement, data sets, prior knowledge and experience, calculation, and communication ("Monsoon Cultures" 530). Markley also identifies "eco-cultural materialism," "heterarchical networks of mutually constitutive identities and relations" (530) in the understanding of environmental and cultural phenomena. Like Brand, Markley astutely recognizes the reciprocal ties of natural and cultural factors. Both also address the time scale, as quite expansive and, in the future, unpredictable, as part of the process of human/non-human change.

cultural attitudes can be detrimental to climate change; 2) culture is what will be lost in a cataclysmic change (nature will rebound in some form, claim critics); and 3) culture signifies the importance and understanding of climate change in terms of knowledge scientific or not.[35]

This is a "slow-but-steady" approach, which posits that large problems seem impossible in terms of solving them in a few years. When thought of in the long term, problems become easier to solve, but no less drastic. The slow-but-steady approach echoes Charles Taylor's "long march" in which "new practices" and/or "modifications of old ones" and/or the "ramification[s]" of these changes give new insight to the populace. For Taylor, the long march starts within in a section of society and is gradually accepted and undertaken by the majority, causing a major shift in the "social imaginary**,**" i.e., the dominant cultural norms ("Modern Social Imaginaries" 111). Most importantly solutions to major problems take a great deal of time, but need to start somewhere. Questions of time and longevity aside, what it seems that Brand, Taylor, Szasz and Beck argue, in Beck's terms, is that "seeing is a cultural seeing" (*Ecological* 14), one that is predicated on the normative ideas and collective functions of dominant cultural ideas. What these scholars and others suggest is that in order to engage with and change problems there must be a connection between the dominant culture and the problems at hand.

Whether termed as "invisible" or "unintelligible," the argument stands that a culture is imminently linked to ecological problems, which ultimately stem from perception and the (in)ability to accept one's embodied, lived-experience as a part of the observational practices. A "knowing eye," which according to Beck is equipped to "read in the book of nature" (*Ecological* 14). The knowing eye is a "vision," "an act of seeing the flowering of a collective vision, a vision of the self in the process of becoming." In this statement, Pierre Lévy argues for a more

[35] The site of knowledge, I think, is two sides of the same coin. On one side, scientific knowledge confirms that a warmer planet causes the recession of a lake. On the other side, indigenous cultures understand that lake levels drop, but do not put the equation into scientific terms, nor do they need to. For both sides, there exists and understanding that something is wrong or changing and something needs to be done. Both points of view, while radically different in many aspects come from a position of cultural approach, recognition, and understanding.

inclusive role of the observer, a role that comes from the acts of "listening, expression, decision-making, evaluation, organization, [and] connection" and "emerges from interactions and contacts, circulation, [and] encounters" (*Collective Intelligence* 75). Like digital materiality, these observational practices require a hermeneutics of materiality (or a material hermeneutics) in which the act of observation is always already one of/with the material world, regardless of the medium or form of mediation through which it is presented. One "reads" the texts as material connection to the material world in which the medium is a part. But, the connection cannot be an *a priori* object, meaning, or desire. The connection simply extends or augments the cultural relationship to the natural world as a material interaction with it. Cultural, as a position of meaning making, must take advantage of the digital and linguistic connections that facilitate a more holistic and closer relation to the natural world. And while decisions will ultimately be cultural ones, cultural will better recognize that the material consequences do not distinguish natural or cultural loss. As Roger S. Gottlieb suggests, "We cannot handle the problem of the environmental crisis by invoking nature…. But what we *can* do is probably more modest and certainly more demanding: to examine the complex patterns of relationships in which we live. If we want to try to transform what we are doing to our surroundings we have to attend to those relationships in all their difficult details" (153).

CHAPTER 2

MATERIALITY AND MEANING

2.1 Chapter Overview

In this chapter, I promote a theory of materiality-as-meaning-making (MAMM), a process that incorporates the physical and abstract properties of the nonhuman world but focuses on how humans understand the "material" world—or what it "means"—through abstract or re-presentative properties and the resulting material consequences. Humans and cultures understand climate change by "meanings" assigned to the material consequences. The materiality of climate change, while always already having material properties and intra-actions in a traditional sense (i.e., landscapes and climates that always already function within an ecology), the "meaning" of climate change has shifted throughout time. In a broad and by no means all-inclusive stroke, climate change has been viewed as speculation, a myth, the end of existence, and an obstacle for capitalistic and economic progress. The current presidential administration campaigned for aggressive solutions to climate change. However, as the world economy struggles, the administration's approaches have softened, to say the least, thereby giving an altered meaning to the material consequence and the administration's actions. I will unravel the theoretical underpinnings of materiality-as-meaning-making throughout the chapter, but I want to briefly describe my use of the term "material consequences." I adapt the term from Kevin J. Porter's work on "meaning consequentialism" in the field of Rhetoric and Composition. Porter states that meaning consequentialism is "the assumption that the meaning of an utterance or text is the consequences that it propagates" (12), meaning consequentalism is not totalizing, static, or given; it emerges temporally under context. More of the nuances of the term will be discussed in greater depth in chapter 3 on materiality and language, but for now, the point stands that to a great extent "materiality," while not excluding the unintelligible or the

agency of the nonhuman world, is the meaning(s) produced through the intra-actions between human and nonhuman and the consequences of those meanings and intra-actions.[36]

MAMM as a theory focuses on the use of "objects" such as language and digital technologies that promote understanding by influencing and "pointing to" some temporal or spatial material condition and/or consequence.[37] MAMM recognizes the physical and embodied disposition of nature and culture meanwhile addressing the often "intangible," "ethereal" things that facilitate (at times to a greater degree) material consequences. The "pointing to" is not a representation, to mimic something, but a "performance" between material, technology, language, environment, and human that results in a presenting again (though not exactly the same)—a "re-presentation," a variant or family resemblance of like substances on a trajectory of

[36] "Meaning," "consequence," and "material" are highly contested, volatile terms. In academics, it seems that these terms are never settled. Nevertheless, there is some unification, generally speaking, when these terms are applied to climate change, environmental issues, and many other arenas in which the public has a general—although not exact—consensus of beliefs.

[37] Without going too far into considerations of time, it is certainly worth noting that time plays an important role in materiality. As will be shown more later, time (in)actively holds material implications away from human perceptions. Moreover, current industrial practices have released implications into the world that will not be known until the future. In her book *Timescapes of Modernity: The Environment & Invisible Hazards*, Barbara Adam posits a timescape based on landscape narratives (all inclusive considerations of all elements, events, and politics that "surround" or are involved in the landscape) and the theory that "Time" is at once temporal (though not linear) and spatial, invoking multiple planes and considerations. For Adam, Time means the *natura naturans* as well as the *natura naturata*. That is the force and 'invisible" rhythms of nature (the invisible energy of nature, the temporally constituted dimension) that manifest into perceptible elements (nature's products). Moreover, according to Adam, the environment is composed of both a perception- and an impact-based dimension, the *Merkwelt* and the *Wirkwelt*. The *Wikwelt* is temporally open and becomes perceivable as *merkwelt* only after it materializes into a visible phenomenon at some time and some place: pesticides in food, climate change, radiation, or other phenomena. Adam employs the theoretical concept of the *hologram* to explain the connection/importance of the invisible energy of nature and the materialized products of nature. *Holograms* are best described as an implication of absence and the idea of resonance. The hologram analogy examines the part-whole relation as one of infinite connections where disturbance in one part affects the whole in non-linear, unpredictable ways. Holography functions on the relations between part and whole. Important in the reading of this project, then, is how materialization plays out in time—how the "hologram" of global climate change reveals the resonating effects of change through the otherwise absent material signs in the world.

meaning. [38] The term materiality, while certainly useful, has become a standard, often assumed definition in environmental studies. The term connotes many associations with the physical, natural world; yet at the same time, it is often indicated in a meaning-making process in which "material" things, both physically and temporally, constitute an understanding–a definition that has other, prolonged or differed "material" implications (which may ripple through the past, present, and into the future). Materiality implies an inherent connection between things and their knotted intra-actions, which, while always in flux, have some "end result."[39] Key to the "end result" is the use of objects of mediation to identify and understand "materiality," which always already includes a physical and "real" identification. This project investigates how mediations of nature ultimately influence the materiality of that "real" nature (at least in cultural terms).[40] As claimed in the introduction, the treatments of large-scale events such as climate change almost always invoke and rely upon MAMM because recognizing the material agency of the natural world without its correlation to the human world through the meaning-making process is often not sufficient.[41] MAMM, while rooted in the physical, material world considers the referents and

[38] Taken from Karen Barad, "performance" and similar uses of the term refer to the move away from rigid representationalism via language (and other tools) and a recognition of the acts of doing, practice, and action ("Posthumanist Performativity" 122). Language does not represent the material; rather, it is a part of the act of "doing" between language user, material, and objects—a performance, an additional presentation, a variant.

[39] The "end" point is not a terminal, set point, but rather, an admission of some consequence or material "thing" on the horizon to reach and achieve in an ongoing a-temporal and non-linear "progression."

[40] Clearly the nonhuman world, especially animals, has its own meaning-making process, but one that certainly differs from the human process. We can "understand" how animals make meaning and what that means to their interaction, but ultimately this understanding is filtered through our discourse and understanding.

[41] This raises two important and controversial points: 1) If the treatment (always by human hands) relies on meaning-making, then our environmental approaches to the event are actually cultural understandings (and implications) of the environment because it is through our understanding of our approaches that we treat the environment. 2) Perhaps a bit far afield, but if we understand environmentalism as culturalism, then how do we treat climate change from a more "environmentally" based approach such as ecology? Ecology, strictly speaking, while having a tendency to get out of whack, ultimately corrects itself or finds balance in a temporal setting. If we are a part of nature, then ecologically speaking, the moves that got us here will be corrected, even if this correction means extinction. But further, and this loops back to cultural

senses produced by language, technology, and other tools that invoke material connections and consequences. These tools influence and are influenced by the material world; but to borrow from Susan Hekman, they supply the boundaries through which we navigate the world ("Constructing the Ballast").[42] But, as she admits, tools have a role in defining those boundaries. Arguably not "material" in the sense of the physical, language and technology facilitates material actions that do compose physicality.[43] For example, discussions of the impact of climate change on remote locations must be "material" (i.e., that they give concrete, intelligible, or tangible meaning regardless of direct physical connection) because the references and senses produced by the discussion will result in material actions that will affect the physical landscape, including humans. But as the discussion moves from tangible object, tangible consequence, or tangible connection, fully grasping the idea of materiality proves difficult when materiality relates to large-scale events and phenomenon such as global climate change. In the decades that climate change has generated attention, it has snowballed into a phenomenon that engulfs the entire planet including strictly human endeavors such as the economy and religious practices. Climate change has not been just about warmer temperatures and melting ice caps for some time. The materiality of climate change extends almost infinitely, encroaching human and nonhuman arenas to the extent that listing the affected parties is a laborious task. The

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approaches, if environmental and ecological are dissimilar, then at what point do we do the best we can with a cultural approach?

[42] Similarly, Donald Davidson suggest the boundaries Hekman references through the intersubjective nature of language: "Language is in its nature, as Neurath insisted, intersubjective; what someone else's worlds mean on a given occasion is always something that we can in principle learn from public clues" ("Empirical Content" 174). Davidson's "clues," while certainly not fixed, provide some of the shaping that Hekman alludes to in her statement. Davidson further suggests "what our words mean is fixed in part by the circumstances in which we learned, and used, the words.… the basic connection between words and things, or thoughts and things, is established…by the causal interactions between people and parts and aspects of the world" ("Knowing One's Own Mind" 29).

[43] Worth postulating, an argument could be made that language *is* material. While its most "material" properties are those that result in meaning, action, understanding, communication, and so on, the use of language does invoke physical properties in its expulsion such as breath, movement, Moreover, as a part of our "being," language is an extension of our material selves, our corporeality.

articulations of the material consequences give a more holistic meaning to the macro effects of climate change.[44] Materiality, as a blanket concept, is defined in the intra-actions among entities. Articulations often flourish through "non-material" vehicles such as language and cultural beliefs that point to a material consequence.[45] It is through the inundation of these intra-actions—the inseparability of objects, agencies, discourse, and other "things" that contribute (recognizable or not) to materiality and material consequences, even if we do not know what, when, or how these enunciations happen. The relations, movements, and the enunciation of "things" in a material world are recognized, according to Martin Bruber, when awareness, "as an act of perception" of a "particular instance of interaction" is reached (qtd. In Maran "Where Do Your Borders Lie," 461).[46] This means addressing materiality-as-meaning-making while humbly acknowledging the limits or our own human comprehension in the larger, material equation.

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[44] "Articulation," as Donna J. Haraway claims, "is to put things together" to gain meaning (as consequence), not to discover a priori meaning in the things themselves ("The Promises of Monsters" 106). The term "articulation" and its variations appear frequently in Haraway's work. For her, articulation seems to be the action/assemblage between material and semiotic, like and unlike things, or other non-exclusive collections from which material consequence spring forth in a non-fixed way. Articulations are always ongoing and always have material (and corporeal) significance.

[45] Intra-action, borrowing from Barad, describes the action between relations of things, not actions between independent "things" ("Posthumanist Performativity"). Interaction, although not quite the opposite, describes the actions between established "things" that have been given some value or meaning prior to the relation. Intra-action describes the enunciation of relations not representations of independent things.

[46] I attempt to demonstrate in the later chapters that perception while broadly conceived is not relegated to passive observation without interaction. Rather, perception should be read in the project as reflexive observation, embodiment, and as Bruber claims, an awareness that goes beyond acknowledgement. I take theories of phenomenology, hermeneutics, and performativity to be at the root of perception. Although seemingly contradictory, these theories share similarities when analyzing human perception and understanding. Briefly, phenomenology gauges perception via embodied connections with the world—how we connect to it and the resulting actions. Hermeneutics views perception in terms of reading, and a "right reading" that produces an interpretation; interpretation can be, I think, extended into connection. How we connect to/through things influences perceptions, i.e., readings/interpretations. Finally, performativity addresses perception as an act between object and observer, again a connection and a perception. In other words, I take the embodied connections of phenomenology, the interpretive and perceptive engagements of hermeneutics and the act of (intra-active) doing of performativity to address MAMM in environmental humanities; it is an embodied connection that interprets meaning through the act of doing with the object.

2.2 Material Connections

Returning to the Katrina example given in the introduction, Hurricane Katrina illustrates materiality in terms of effects on the physical landscapes (including human bodies) and its discursive wrappings**.** As the world watched (through media and virtual climate models), an uneasiness of what was really unfolding became apparent. Not only was the storm changing the physical landscape of coastal Louisiana, but it was also revealing the cultural landscape of how the world (specifically the United States of America) viewed issues of race, class, economics, and identity. Hurricane Katrina became as much a cultural crisis as an environmental one, and the two were certainly connected.[47] Nancy Tuana, in her essay "Viscous Porosity: Witnessing Katrina," considers Hurricane Katrina as a mix of natural, cultural, political, social, and other categories. According to Tuana, borders between nature and culture exist, but these borders are not so rigid as to exclude the wrappings of nature and culture from one another, nor are these borders so fluid that nature and culture always pass effortlessly with(in) one another. She terms this theory "viscous porosity." Hurricane Katrina was an early and popular example of whether the storm was "natural" (read traditional views of nature versus culture) or heavily influenced by human actions.[48] Regardless of the distinction, when the waters receded, it was clear that both human and nonhuman elements were affected and had been affected by one another.

Tuana's concern lies with the connections between the material world and a socially constructed one, and how both approach, influence, and affect one another. We know that natures, bodies, politics, and economies (for example) have a stake in climate change. To

[47] The connections between cultural issues such as race and class and environmental issues is a central topic for Environmental Justice. The arguments follow that people on the lower end of the socio-economic scale are often subjected to higher amounts of environmental problems, including toxic waste, pollution, heavy-metal poisoning, and other quality-of-life issues.

[48] Bill McKibben's *The End of Nature* makes the claim that all storms in the post-industrial age are no longer natural, if by natural we intend "removed from and not influenced by man's touch." While McKibben's statement suggests and idealic, pastoral nature, a controversial suggestion, the statement goes a long way in questioning the connections between the human and nonhuman world.

construct insurmountable borders between categories that suggest a strictly cultural or natural definition of climate change forces us to decide which is valued more—human or nonhuman—and fails to align the material consequences that affect both. Theories of materiality attempt to illustrate how the human and nonhuman worlds affect one another through various corporeal, technological, ideological, and other combinations. N. Katherine Hayles, for example, describes materiality in literature studies as a "process" in which not all of the components can (or should) be known. The significations of the process surface between elements at "play"—keeping in mind, of course, that understanding the signification may be different for different individuals. Hayles considers materiality to be "a selective focus on certain physical aspects of an instantiated text that are foregrounded by a work's construction, operation, and content. These properties cannot be determined in advance of the work by the critic or even the writer. Rather, they emerge from the interplay between the apparatus, the work, the writer and the reader/user" (Hayles, "Materiality Has Always Been in Play"). Materiality, in literature studies or environmental studies, is open-ended, non-exclusive, and defined by the articulations of the parties involved. For Hayles, there is an intrinsic connection between objects in the world (loosely defined) and the understanding of material articulations. [49]

[49] I take Hayles' idea of play as different from the Derridian notion of play. For Derrida, play is a continual deferral, an ongoing postponement or suspension. In my reading of Hayles' use of the term, "play" appears to be an ongoing mutability, a perpetual variable. Although the two treatments of the term are not completely dissimilar, Hayles' use of the term seems to take into account the enunciation of the intra-action at the moment of exchange, i.e., the importance of the present in material understanding. Conversely, Derrida appears to focus on play as a "disruption of the presence" ("Structure, Sign, and Play" 292). Nevertheless, I should note that Derrida's deference and disruption of the present may be important in addressing materiality in phenomenon like climate change that have little temporal or spatial, (i.e., present) constraints. While climate change activists stress the need to act in the present, the effects of climate change are routinely predicated in the future, deferring any "meaning" until the future arrives. Thus, the notion of the present only works so far as to acknowledge a change now for the future. Reducing the parts-per-million of CO_2 now will have little effect on the present but will greatly impact the future. In spite of this, I still feel that the idea of play as a variability in intra-action in the present best represents materiality because humans ultimately are locked into their embodied connections, which are always in the present (unless one considers memory or thinking about the future as forms of embodied connections).

We come to understand the importance and dependence of human devices in "re-presenting" materiality through these embodied connections.[50] Through semiosis "things" gain more and more material intelligibility—things do not come into being; rather, their intra-actions are codified. Nevertheless, a re-presenting never guarantees comprehension. The semiotic process, to adapt an idea from Susan Hekman, facilitates an understanding of materiality in humanistic terms; it does not idealize or "privilege" humans or our semiotic artifacts of the nonhuman world ("Constructing the Ballast").[51] The human and nonhuman are intrinsically linked, even if the articulation of the material is in human terms. However, a change in one does not necessarily mean a change in the other.

2.3 Matter Matters or Materiality as Meaning(s)

"Matter is always already an ongoing historicity," claims Karen Barad (139). However, materiality as always ongoing becomes problematic as it incorporates abstract qualities, but concentrates on physical, experiential consequences. Yet, often times the most significant material consequences are not reflected in the physical. Materiality-as-meaning-making focuses on the use of tangible but less-materially direct artifacts such as images, economies, cultures, and so forth that connect to the material world and produce material consequences. While "materiality" as a theory addresses the material experience (climate change, economics, images, science.), it simultaneously attempts to cast aside those conventions that *potentially* cloud the material world (language, images, economics, science). Toward this end, "materiality" as a theoretical paradigm has a dual role of description and emergence, of totality and singularity, of gain and loss, of sum-total and equivalent parts. Addressing materiality means admitting that not all of the "parts" are or may ever be known, and that some of the "parts" may

[50] To re-present is to examine the articulations within the process of engagement between human and nonhuman worlds. A re-presentation is not a copy or a surrogate but a point of articulation. For example, atmospheric climate change images do not copy or stand in place of the atmosphere; rather, they are an articulation (and a like variable) in the process of examining climate change.

[51] Hekman's original statement reads: "not to privilege the discursive over the material but to understand the material in discursive terms" (88). See her work in *Material Feminisms*.

in fact obscure other material happenings. As Albert Borgmann declares, "the ancestral environment, however and wherever humans moved in it, maintained a focal area of presence with a penumbra of signs referring to the wider world" (25). In other words, materiality is paradoxically bound in our direct and indirect connections to the environment but also to the spatial and temporal trajectory of these connections. In the current political atmosphere surrounding climate change, issues such as the economy and bi-partisan politics, which are very much a part of the materiality, obscure (or overshadow) the materiality of green technology and fossil fuel consumption to name a few.[52]

Materiality cannot help but be, at once, a point of attention and inattention. Theorizing the "material" easily falls into a trap of "everything is material and/or has material consequences." Although not untrue, some material consequences articulate and some obscure; ultimately, "materiality" is determined by which articulations carry meaning. In the essay "Climate Change, Environmental Aesthetics, and Global Environmental Justice Cultural Studies," Michael Ziser and Julie Sze acknowledge the irony of the polar bear—not scientific data—as a driving force in the climate change campaign. Ziser and Sze acknowledge the sentimental and cultural significance of the polar bear having an impact on responses to and perceptions of climate change, an impact that at the time rivaled scientific data. Scientific data was overshadowed because of feelings for the polar bear.[53] However, since its rise to fame as global climate spokes-animal, the polar bear has been usurped by a more immediate connection to people's lives: the economy.

[52] Briefly, this inclusion/exclusion of materiality also happens with less humanistic factors. For example, cold spells, harsh winters, and abundant snow in different areas of the country during the 2009-2010 winter have convoluted the public's perception of climate change, routinely thought of as a progressive (and noticeable) warming trend.

[53] Of course, one can and should argue that although a logical spokes-animal for climate change, the polar bear as iconic image gained traction in the last two decades because of its portrayal in popular culture, especially the holiday advertisements from Coca-Cola that launched yearly commercials, toys, and so on. The argument could follow that the meaning of the polar bears' plight could be largely based upon its cultural, and not its natural, significance.

In his work on the effects of media in the electric age, Marshall McLuhan examines relationships between humans and the surrounding world. McLuhan's claims (rightfully or not) could be read as an early foray into material connections with our surroundings through media applications. While much of McLuhan's work is deterministic, i.e., that the human is determined by his technology, certain aspects of his work provide a structure to the ways in which materiality blossoms into our cognition through different media. In *The Global Village* McLuhan discusses how "[a]ll cultural situations are composed of an area of attention (figure) and a very much larger are of inattention (ground). The two are in a continual state of abrasive interplay, with an outline or boundary or interval between them that serves to define both simultaneously" (5). McLuhan's "tetrad" provides structure to the workings of materiality as a theoretical paradigm that relies upon perceptions of that which is in focus and that which is not. In climate change, the attention (figure) is showered upon immediate and isolated acts of change. And while some have significant impacts, many appear trivial because they are not consistent with the larger area of inattention (ground) or do not follow some perceived congruence with the trajectory of climate change. While Barad is absolutely correct to suggest "[m]atter is always already an ongoing historicity" (139), McLuhan's tetrad is a useful lens for examining material-semiotic articulations that mark the historicity in our cognition and the mutability of material consequences and meaning.

In a January 2010 posting on the "The Cleanest Line," a blog hosted by the outdoor apparel and environmental activist company Patagonia Inc., readers are asked, "[d]o you see evidence of climate change affecting animals in your area?" The author, Douglas Chadwick, is a biologist who lives in Northwestern Montana near Glacier National Park, an area critically (and noticeably) affected by climate change. Over time, Chadwick details a shift in native and non-native animal species, altered migration and hibernation patterns, less snowfall, more drought,

and, detrimental to the namesake of the national park, rapidly melting glaciers.[54] Through his observations, Chadwick accounts for a dramatically changing landscape and a significant disruption of a delicate (and well-documented) ecosystem. While Chadwick provides a rhetorically brilliant move of culling his alarmist tone, he admits that, according to his observations, Northwestern Montana is drastically changing.

The example illustrates that materiality runs a parallel trajectory of ongoing and articulated historicity. Chadwick mentions briefly the oddity of animal species sticking out against the brown landscape of an otherwise white winter. Normally, the coats of these animals, in order to avoid predators (or be effective predators), change to white to match the winter snow, but this change has been altered. Chadwick's conclusion is that "this can't improve survival." On the one hand, the material consequences of climate change are ongoing recorded through Chadwick's observation. Materiality happens, continues without stopping. Such is the case with evolution and planetary development. On the other hand, Chadwick specifically notes articulations that he views as significant and meaningful to the Northwestern Montana landscape, or at least his recognition and value of it.[55] Karen Barad's theory of material intra-action is at work. The articulations between nonhuman factors (and human observation) of the always already material world continue to happen. Yet, to paraphrase N. Katherine Hayles, the inclusions with(in) materiality are not predetermined; rather, what is contextually (or humanly)

[54] The material consequence on Glacier are interesting because in addition to the loss of physical, material glacial, animal, and other nonhuman factors, the park's discursive namesake will change as well as its cultural and historical significance. While perhaps easy to sweep under the rug of planetary evolution, "The Park Formerly Known as Glacier National Park," will probably hold less cultural, political, and national significance once its namesake has vanished. Or at the very least, the park will be a different place for nonhuman and human alike.

[55] One wonders, also, about the cognition of animals as they experience change in temperature, landscape, but not in biology. In terms of a general materiality, change happens. In terms of materiality-as-meaning-making, change happens, but a degree of signification is attached. Worth considering or at least thinking about in human/nonhuman cognition, as Davidson explains, is that "what makes the particular aspect of the cause of the learner's responses the aspect that gives them the content they have is the fact that this aspect of the cause is shared by the teacher and the learner…. A noncummunicating creature may be seen by us as responding to an objective world; but we are not justified in attributing thoughts about our world (or any other) to it ("Epistemology Externalized" 202).

important in the material process is revealed (and selected) in moments of the interplay ("Materiality Is always in Play"). Materiality has an area of attention—what becomes intelligible through a process of meaning-making for humans—as well as inattention—what remains unintelligible, not fully considered, but very much still material and "happening." In other words, there is a two-fold materiality that always already occurs: the material process of human and nonhuman that remains "below the radar," so to speak, and a material process of meaning-making by which humans can identify "materiality." Materiality runs across multiple axes that can be described as "happening" in the world (as broadly conceived as possible) and "happening" in human re-cognition and intra-action. Materiality is the intra-active processes of the "things-in-the-world," but also the ways in which these things "appear," gain meaning, and evolve beyond the meanings that "compass" them (Scott, *The Lives of Things* 20).[56] The material world is not passive. Materiality is, in Andrew Pickering's words, "a joint production of human and nonhuman" in which materiality is understood as a "becoming," an emergence of human/nonhuman intra-action ("New Ontologies" 2). Both human and nonhuman are de-centered in the active, a-temporal process. Nevertheless, materialities often times "are hidden in their appearances unless the occurrences of appearances appear by means of specific investigation, analysis, and discourse. They comprise a nonhuman dimension in the sense that silent functions are not necessarily dependent in their occurrences on human meaning. But they nonetheless compose and limit, largely silently and not altogether humanly, events of appearing" (Scott, *The Lives of Things* 20).

[56] Charles E. Scott coins this idea as "physicality," a term that describes how things appear to "organic functions" in the world and take on meaning. For Scott, physicality is recognized in mostly physical, i.e., tangible acts, but extends to the way organisms use organs such as ears, brains, and so on, to perceive happenings in the world. See *The Lives of Things*.

2.4 Material Intelligibility and Enunciations

In 2010, *Newsweek* published a limited run magazine, "100 Places to Remember Before They Disappear." [57] Like many "must see" or "must do" lists found in any number of mediums, *Newsweek* places certain cultural and (to a lesser extent) environmental value on locations, both natural and built, that are threatened to disappear as a result of climate change. Certainly critics could chastise the publishers for its reliance upon worn tropes and very idealized and familiar areas of the world that the collection describes as, "some of the most beautiful places on earth and a reminder that they are magical, fragile, and, ultimately, transient" (Zakaria). Within this antiquated approach to the environment, the magazine does admit to the "arbitrariness" of the list and the uncertainty (and complexity) of what could (potentially) happen to the planet. *Newsweek*'s approach suggests that, *other* places are certainly material, but they do not "mean" (or are not valued) as much to the publication nor do they strike a sense of urgency in the reader. Yet, read another way, the list acknowledges the independency, agency, and interactivity of/by the natural and cultural worlds through the inclusion of places that we often times forget are both natural and cultural such as city coastlines, national parks, and monuments. *Newsweek*'s inclusivity and connectivity establish a materiality of meaning-making by tracing materiality (and what it means) through water, from remote "untouched" locations to sprawling metropolises, arguing that, "[t]o understand the impact of climate change, you mostly have to follow the water" (Zakaria). Water, not only as an elemental connection but also as an indicator of human habitation, stands as one of the many threads in the larger material equation. In this example, however, the publication points to what water means, and the consequences of its absence or excess for human and nonhuman agents. *These* places are

[57] Particularly interesting in the light of this project is the use of "Remember" in the title and focus of the magazine. "Remember," as a mediation of direct exposure, invokes temporal and physical considerations that may imply a degree of urgency as these places disappear, only to be remembered (and mediated) as well as a connection to human ethical and moral thoughts about these places as we remember how they once were (and hopefully work to avoid any further loss).

certainly material, and facilitate more "meaning" (and value) to the overall material equation, including *other* places. The potential consequences are, comparatively and broadly speaking, similar for less random places or those closer to one's home.

The "arbitrary," yet logical, if not arguable, approach *Newsweek* adapts speaks directly to MAMM not as a selective (or arbitrary) process, but, as Karen Barad argues, how we obtain knowledge about the material world, through intra-acting as a part of it ("Posthumanist Performativity" 147). Certainly *Newsweek* is not reporting on direct experience (hence the importance of mediation), but from data and observations gathered about human/nonhuman connections within the world. Living in the world, as knowledge formation, gives meaning to the consequences, making the idea of "arbitrary" less about randomness or capriciousness and more about re-presenting the material consequences of human/nonhuman intra-action through a given medium. In the *Newsweek* example, materiality is not about the specific content presented (glaciers, for instance); but rather, materiality is significant for the consequences the medium produces for the human/nonhuman world no matter how remote.

2.5 Mangled Matter and Things That Matter

Materiality is a "mangle," a mix of all things, to use Andrew Pickering's term, yet one that can act entirely outside of the scope of human perception.[58] Barad, Pickering, and others argue that the world does not exist through discourse (and other signifying practices) or representationalism and things-to-be-represented (Barad, 122-125). Such views depict a world waiting to be inscribed with meaning and identity, pre-determined but waiting for signification. For Barad, the borders of intra-action are never pre-determined but emerge in the performative process, stating,

[58] The mangle, like many "active" definitions of materiality, is a performance based and evolutionary (not causal) process. Material agency and human agency intertwine through the acts of science in which human agency is affected by and becomes aware of material agency. Echoing statements from scholars such as Haraway and Barad, and from the implications of scholars such as Deleuze and Guattari, Pickering claims that "[t]he world makes us in one and the same process as we make the world," an "interdefinition of human and material agency" (*The Mangle of Practice* 26).

> It is through specific agential intra-actions that the boundaries and properties of the "components" of phenomena become determinate and that particular embodied concepts become meaningful. […] [R]elata do not preexist relations; rather, relata-within-phenomena emerge through specific intra-actions. (133)

The world is not an a priori object waiting to be discovered. Yet, processes of material discovery and meaning, such as Bruno Latour's "circulating reference," acknowledge a nonhuman materiality (and agency) in "the things themselves." Taken as a performance, Latour's theory analyzes the translation of the material to the semiotic (and as material-semiotic) in which the continuity between material and semiotic, between representation and thing-to-be-represented, is maintained, or at least maintained to a degree ("Pandora's Hope"). The translation of soil to data is a variant of the organic matter, not the material composition of the soil itself. [59] The "soil" is re-presented in a variant articulation that has similar material consequences (if not more) for the human/nonhuman relation. For large, abstract phenomenon like climate change, meaning is enunciated through flexible material identities and porous borders. Moments of articulation are materiality because they mean something. While substantiating what is (or is not) material, meaning or intelligibility contributes to awareness and "inclusion" in the grander material equation. To "mean," to become intelligible, Barad argues, is not uniquely human; it is, rather, an articulation ("Posthumanist Performativity"). Materiality will always be material (tautology aside), but it gains meaning through how it is disclosed—as Hekman terms it—or re-presented with some understanding of consequence ("Constructing the Ballast"). For Hekman, "disclosure" "brings to light" the material in which "[d]ifferent aspects of reality can be disclosed from different perspectives." Hekman continues, arguing that no one aspect is correct, but that "it is possible

[59] In other words, the soil is soil. Its material identity is not changed. Rather, the soil has been deterritorialized as organic matter (although the soil does still exist) and reterritorialized with every attempt to maintain the material identity (as properties). The reterritorialization then produces a multiplicity of articulations as "soil," its identity, and through different mediums. I will cover more of the semiotic correlations of the circulating reference later.

to compare the material consequences of the different disclosures of the same reality" (*The Material of Knowledge* 92).

Materiality can, in fact, be measured as if to postulate the articulation prior to the actual enunciation. One can guess that mega-fauna, particularly those in sensitive areas such as the polar-regions ("canary species" as they are sometimes called) will be adversely affected by climate change; thus, a certain degree of planning and study can be anticipated and "set up." Outlines can be established in advance in order that the phenomena emerge intelligibly to human perception and understanding. Not "stacking the deck," as Latour claims, or coercing certain consequences, the set up to the event is one that distinguishes, not influences the intra-actions (*Pandora's Hope* 49) because as Timo Maran states, "[t]he possible roles of the meaning relations in our subjective world are not determined in any present moment. Therefore it is also impossible to predict which meanings will gain a more substantial role in the future" ("Where Do Your Borders Lie?" 468). Maran examines the ethics of the human relations to the nonhuman world as a sign/meaning relation, which I will address later. For now, the important point stands that, in spite of the anticipation or expectation of phenomena or consequences, certainty of the whole (of the phenomenon) is less predictable. To understand that polar bears will be affected by climate change does not really manipulate or persuade (regardless of how they are perceived culturally), but provides a potential map (and directions) by which certain, but not all, effects of climate change become manifest and are thereby understood.[60] As a reference, argues Latour, the critical point is to maintain "something *constant* through a series of transformations," or intra-actions, a mapping of potential and actual possibilities (*Pandora's Hope* 58). Materiality-as-meaning-making rests within our ability to recognize as many of the

[60] A map can give directions information, but it cannot provide an exact copy of the terrain. For example, Google-pedometer maps go a long way to provide distance for the runner, yet the maps do not provide specifically for other elements such as elevation, landscape, and weather—an additional running or exertion. So, when the map indicates a 5-mile run, it may not take into account the additional .25 vertical miles that will be covered in ascent and descent. The effects of the extra mileage may be "understood"/articulated in additional time, soreness, and other indicators that are not directly designated on the map.

intra-actions (that may manifest in inconstancies) while maintaining the cumulative consequences of climate change in articulation and intelligible mapping.

Mapping is a "performance" of known and unknown articulations and variable modifications. For example, while environmental movements have always benefited from and capitalized on mega-fauna, the ascension of saving polar bears over saving humanity is perhaps less predictable. While my example is exaggerated and oversimplified—the situation is much more complex—my point is that the "lines of flight,"–as Gilles Deleuze and Felix Guattari term the abstract lines of deterritorialization and reterritorialization of phenomena–of material intra-actions can be random, and are most certainly multiple (*A Thousand Plateaus*).[61] Yet once the material object is cast, once the borders have been recognized (if only briefly), it becomes possible to examine the material equation through the "map" which conveys the actual and potential connections and consequences. The possibility of examining carbon emission, deforestation, overpopulation, and so on as they appear or are re-presented on the "map" or trajectory of climate change happens when material articulations are recognized. In other words, the things-in-themselves become clearer; yet, each is only materially significant in the contextual moment of its articulation, even if this "moment" is in applying the past and/or future to the present.[62]

Generally, when we think of climate change, we think of much more than just rising temperatures and species extinction. We think of science, politics, technology, human and nonhuman suffering, and tomorrow to name a few. Climate change is increasingly recognized

[61] Think back to the early examples of Hurricane Katrina. Multiple intra-actions occurred, some of which where assumed and/or predicted, such as the costal destruction. However, many of the intra-actions were quite random and became the focus of the storm, such as the human suffering resulting from the delayed response time of the government and poor conditions of the city post-storm.

[62] For example, the articulations of Katrina continue to be in play as the city still recovers, the country compares Katrina to the Gulf oil spill, and in many other events in which the materiality of Katrina is engaged or referenced.

as an "assemblage" of multiple agencies and consequences.[63] The "things" within an assemblage have "significant otherness," to borrow a term from Donna J. Haraway, in which they are neither the entirety nor a proportion, but are connected in often disparate manners (*Companion Species Manifesto* 8). Economics and animals connect in various ways as examples of and players in the climate crisis.[64] Along with the intra-active process, economics and animals are things themselves and hold materiality as such. As the assemblages and articulations become more and more apparent, so too should the ways in which we can address the problem. Yet, while it is perhaps easiest to identify the "material" assemblages, in order to completely deal with the issue, we must also approach the re-presentations and subjectivities, or the nuances of each identifiable "thing" in the list of many that affect the climate.

2.6 Material Borders and Mutable Embodiment

William Cronon's well-worn claim that "wilderness" is a particular cultural construct in a particular historical period suggests that there is a high degree of human intra-action in the material assemblages, i.e., the "meaning" of wilderness ("The Trouble with Wilderness").[65] For Cronon and many others, wilderness or nature certainly exists; it is has physical, material properties and "acts" with or without humans. Yet the essential point in Cronon's statement is the degree to which humans assign a (political, cultural, social,) value to the nonhuman world. While much of this has to do with meaning and understanding, it is worth exploring the contact zone within the assemblages between human and nonhuman, i.e., those points in which intra-

[63] Borrowing the term from Deleuze and Guattari, "assemblage" refers to the formation of the multiplicity of connections between "things" and "objects" (including cultural to natural artifacts). See *A Thousand Plateaus: Capitalism and Schizophrenia*, especially pages 22-23.
[64] The amount of methane gas produced by livestock in the feed industry is one such example. See "Livestock and Climate Change" by Robert Goodland and Jeff Anhang, which claims that livestock account for 51 percent of worldwide Green House Gas Emissions. Robert and Brenda Vale argue that owing a domesticated animal can contribute as much to climate change as an SUV or other large automobiles. See the 23 October 2009 issue of *The Telegraph*.
[65] See, also, Roderick Nash's *Wilderness and the American Mind*. Nash makes similar arguments (years before Cronon) about the elusiveness of the term (and idea) of wilderness and how defining it comes down to how wilderness is thought of at a particular time and context.

action, the movement of materiality, manifest and become solidified in human experience.[66] N. Katherine Hayles proposes a "world" as an existing entity that predates humanity—though only in perception and the possibilities that it held. The world also exists as a simulation constructed by humanity in human interaction with and influence on the world ("Simulated Nature"). Hayles continues, claiming "the most we can say about what is 'out there' prior to perception is that it is an unmediated flux, a stream of potential experiences that will happen differently for differently situated observers. As these actors, human and nonhuman, interact with the unmediated flux, their world comes into being" (413). The ideas from both Cronon and Hayles illustrate the human connection and role in the material process. "Our" materiality, what we can and do engage, relies on human comprehension and involvement. While certainly the nonhuman world is in a process of continual intra-action, humans become aware of this intra-action (to varying degrees) when they are aware of their participation or position in the process. Climate change, it seems, has had at least two distinct materialities that humans can address: pre- and post-human influence. Ice core samples tell the story of climate change from thousands of years before humans. Scientific-narrative accounts record the history of climate change and human influence. Yet, what Hayles specifically and Cronon implicitly state is that human and nonhuman examinations come down to the point of contact, the interface between the two. For Cronon the interface is culture. Moreover, Cronon (metaphorically) argues that wilderness must also be considered closer to "home" in the areas people live, work, and play; in other words, wilderness is in contact with people, not just an idealized locale devoid of humans (90).[67] For Hayles, the

[66] Identifying nature as a cultural construct or that nature has clear historical markers is different than saying nature is a continuous intra-action with ever-changing boarders. To understand nature, the concept, humans delineate it through scientific and historical means, they engage in the knowledge-making process. To understand nature, as nature and by nature, simply means to go through the non-spatial or temporal binding intra-action that has gone on for billions of years. Cronon, while completely right, addresses our material embodiment of nature, not as a nature of agency, but as a second layer folding of nature-as-material through corporeal embodiment, i.e., human interaction.

[67] The contact between humans and nature has increased even since the original publication of Cronon's article. Computer and telecommunication technology has collapsed the distance

interface can be a number of items between humans and the unmediated flux (most frequently for Hayles, the interface is some type of text or computer technology). Regardless, both Hayles and Cronon address the intra-action of human and nonhuman as the "site(s)" of materiality. Put another way, both scholars point to the ways in which human and nonhuman actions embody one another, deterritorializing and reterritorializing one another in material process. Hayles states, "worlds come into being as a result of [interactivity]. Not the observer alone, and not the unmediated flux alone, but the two together in dynamic interaction" (418).

State and national forests are prime areas in which the shifting territorialization of human and nonhuman materiality and meaning-making takes place. Many of these regions are managed by national, state, local, private, and public agencies. The borders distinguishing the cultural significance are often marked through signs and fences, but frequently the divisions are not marked. Often these borders split geography down the middle, de- and re-territorializing the cultural, political, and at times ethical significance and meaning of the region. The physical materiality remains the same on both sides of the border, yet laws governing what humans can and cannot do may change significantly with a single step. In meaning, the cultural (speaking broadly) norms and values exceed (or are supposed to) natural landscape—even when considering what's best for the landscape (because it harkens back to human value of the area). Both sides of the border are "material," they do share like physical properties; however, when the cultural tangibles intra-act with the landscape and humans, the border gains different material consequences for the participants, including nonhuman. The border "means" little to the nonhuman world, perhaps nothing more than an obstruction, but how humans act within the understandings of said boundary does have material consequences on nonhuman and human alike. The management of invasive species, fire hazards, and public access on one side of the

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between human and nature, even in those remote places that will never be physically touched by most humans, which are now accessible online, through story telling and a host of other mediums that grant "access" to these remote places. I will address language and computer use in the later chapters.

border influences the other side—as the species spread, fire carries, or over-access causes land erosion that creeps to the other side. The ability of private landowners, for example, to light fires on their private land is mandated by local, state, and national governmental oversight that decides when and if it is safe to burn. Here, human/nonhuman materiality can go both ways as human agencies decide against burning for the sake of the forest, whose impact on human value in turn impacts its own potential longevity. Environmental actions are embodied in social and cultural norms.

Stacy Alaimo argues that humans have a "trans-corporeal" relation with the environment.[68] This relationship is, according to Alaimo, "the time-space where human corporeality, in all its material fleshiness, is inseparable from 'nature' or 'environment.' Trans-corporeality, as a theoretical site, is a place where corporeal theories and environmental theories meet and mingle in productive ways" ("Transcorporeal Feminisms" 238).[69] Corporeality is the site of intertwining between the winding trajectory of nonhuman and human materiality, between the "matter that matters" as Karen Barad argues, and the "matter that means," a consequence to human understanding and intelligibility. "The body is," as Haraway states, "a collective; it is a historical artifact constituted by human as well as organic and technological unhuman actors" ("The Promises of Monsters" 87). More importantly, Alaimo's theory and

[68] Humans are embodied with language and technology. Embodiment is an ongoing flow, a material intra-action, with traces to the moments of enunciation of these intra-actions. Traces can be viewed as phenomena, but the phenomena-in-action constitute the flows and trans-corporeal nature of embodiment of language and technology mediation. Traces of the phenomena also become instant, non-traceable and emergent without a priori (I cannot trace my first intra-action with language or technology, but the base of those intra-actions emerges later.)

[69] Jane Bennett, like Alaimo, focuses on the "vitality" and "vibrancy" of matter (specifically nonhuman matter) in her book *Vibrant Matter: A Political Ecology of Things*/ For Bennett, nonhuman agency affects humans (and human agency) and removes the notions of anthropocentric thought that places human actions above the nonhuman world (and/or disconnects the two). Bennett defines "vitality" as "the capacity of things—edibles, commodities, storms, metals—not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own" (viii). Bennett wants to address how human politics will (or would) change if nonhuman things were given their material due.

Haraway's statement imply that humans are continually in corporeal embodiment with nature (only in contact, not in a pre- or post-prior meaning or consequence), through the intra-action (as Barad states), the viscous porosity (as Tuana claims), and the notions of play (as Hayles argues). Yet, critical here are the ways in which materiality, not as human construct, but as a human condition, is manifest in human actions, even those seemingly unconnected to the nonhuman world. The political and ethical considerations become apparent as trans-corporeality-as-embodiment suggests that humans-as-connected-to-nature are recipients of the actions they cause, what Ulrich Beck terms the "boomerang effect" (*Risk Society*). Human action ultimately comes back to impact (no matter how slightly) humans. Climate change is no exception. More than depending on the system, humans are a part of the environmental system they seek to exploit. The body, as both material and meaning, stands as a porous site by which the abstract and lived experiences are codified and used as our guide to the world.[70] The corporeal body is, I think, our interface to the world; it is how and through which we make meaning and live.[71]

Alaimo's treatment of materiality is important as it focuses the point of examination of the contact zones between human and nonhuman entities. Such an approach balances the material agencies of humans and nonhumans yet could imply that the body is the site in which

[70] This claim extends also to the animal world. When animals enter a new environment, or their environment is changed, they must go through a meaning-making process in order to situate themselves with(in) their new environment. Current examples are the major corridors that connect migration routes for animals. As human development has invaded many of these areas, animals have had to adapt (sometime unsuccessfully) to obstacles such as highways, cities, drilling sites and so on. However, I am not sure to what degree we can extend the meaning-making process to other nonhuman organisms, materials, or elements.

[71] In the following chapters, I expand on the role of language and technology in materiality. While I may be relying too literally on the corporeal connection to the world, I feel that we cannot go above or beyond our body and all of the qualities (speech, vision, thought, feelings,) that it describes. Without going into arguments about separating consciousness from the body, I do feel that there is a degree of projection of the body and its senses through language and technology; nevertheless, these projections are immediately traceable back to the body. In literary terms, the corporeal body is the beginning and end of all "intertextuality." We can certainly draw from other "texts", but ultimately our body is our reference point.

this balancing occurs, at least for human consideration.[72] The proximity of the nonhuman world literally (and figuratively) at human flesh suggests an ongoing performance of human and nonhuman factors as these intra-actions reveal the ways in which the human and nonhuman worlds leak and drift into and out of one another. The barrage of intra-connectedness that appears to be always already ongoing with materiality posits the necessity of *thinking* and *acting* through the intra-connections when possible, not taking them for granted. Humans cannot know or understand all of the intra-actions or their consequences, but those that can be grasped—those that "mean"—should lead humans to think and act toward the *potential* and *actual* materialities. While we are hard pressed to understand or even recognize all of the intra-connections in climate change, we can think and act through those intra-connections that are and have become clearer (landscapes, economics, politics,) and some of those that are potentials (sea level rise, political and economic instability, famine). Again, Hurricane Katrina provides a telling example of (still ongoing) intra-actions between human and their semiotic practices and the nonhuman world. More importantly, while some of the articulations of the storm were realized prior to the event (low-land area, compromised levees, fractured infrastructure,) many of the most telling and significant ones were only realized after the storm had calmed (slow response times, political disarray, racial and geographical prejudices).

2.7 Circulating Reference and Materiality Beyond the Material

In spite of our embodied connections, one of the potential problems with materiality when articulated through events like Katrina, or re-presented in mediums such as *Newsweek*'s list, is that the implications are often abstract, global, and a-synchronous. Andrew Pickering states that materiality is "temporally emergent," and "the contours of material agency are never decisively

[72] While certainly not totally reducible, the human and nonhuman realms become more intelligible to humans as they engage with their environment(s) through language and technology, which reciprocate back into the intra-actions. Latour's "thing-in-itself, while not a reduction, is a "doing" that trans-lates in(to) the world. ("Late," here, is a temporal and spatial constraint in which the object moves across time, space, and materiality, providing meaning while pulling through with it (like a fisherman's net) past and potential meanings.

known in advance" (*Mangle of Practice* 14).[73] While absolutely correct—"decisively" the key term—the problem, becomes, the acceleration of pace and scale of our connections, which has ushered us to the point in which we need *temporally pre-emergent and post-emergent* understandings of materiality and consequences.[74] Examining materiality-as-meaning-making becomes important as the theory wrestles with arguably non-material things that have material consequences as well as identifying those temporal markers that guide understandings. Language and digital technology are the focuses in this dissertation project; however, memory, aesthetics, religion, and so on have similar workings in the material equation.

Materiality-as-meaning-making establishes our understandings (and meanings) of temporal articulations. "Articulation," Haraway's "putting together" of like and unlike things, surfaces as a language-mediated practice, a material-semiotic assemblage of continued flux. But unlike the language-mediated practices that scholars argue remove the "voice" from the object of representation or places power in the discursive colonizer, language is a co-conspirator in the meaning-making process ("The Promises of Monsters" 88-89). Articulations are the actual and potential nodes of material-semiotic relations and the actors, which dissolve binary categories isolating one from another or suggest that one results (only) because of the other. Haraway's concept of the "material-semiotic actor" highlights the actors' roles in materiality and meaning-making. Quoting at length, Harway states:

[73] Pickering's central argument, I think, is that we have things happening that we can and cannot account for and that for science this means understanding the resistance as well as the assistance. Science is a process, one can never understand all of the factors (and must take some factors on faith), but it is the best we can do.

[74] Paul Virilio argues that there is another form of pollution to accompany ecological and social pollution, a pollution of distance. For Virilio the acceleration of time and collapse of distance has caused a world in which real time is global time—the past and present are here, everything is now. This theme is particularly important with climate change as the temporal and spatial considerations stretch our awareness to the point in which we must know a "pastoral climate change;" that is, a "natural" one without humans as well as a climate change in the future, which has been decided now, but may never be know when the future is present. See the works of Virilio, especially *Information Bomb.*

> This unwieldy term is intended to highlight the object of knowledge as an active, meaning-generating axis of the apparatus of bodily production, without *ever* implying immediate presence of such objects or, what is the same thing, their final or unique determination of what can count as objective knowledge at a particular historical juncture…bodies as objects of knowledge are material-semiotic generative nodes. Their *boundaries* materialize in social interaction. Boundaries are drawn by mapping practices; 'objects' do not pre-exist as such. Objects are boundary projects. But boundaries shift from within; boundaries are very tricky. What boundaries provisionally contain remains generative, productive of meanings and bodies. ("Situated Knowledges" 200-01)

For Haraway, then, the material-semiotic is the enunciation of "objects," of material considerations that establish new locations, identities, and knowledge practices.

Material-semiotic articulations are critical in the 21st century as humans are forced (by their own hand) to recognize materiality without temporal or spatial constraints. The acceleration of pace and scale of industrial society has released materialities that, although happening currently, will only be known in the future. For example Peter C. van Wyck, in *Signs of Danger: Waste, Trauma, and Nuclear Threat*, examines the inevitable gap in signifying toxic and nuclear wastes for distant future generations. These wastes, with halve-lives in the thousands of years, will most likely outlive human existence on the planet. Theoretically then, the means to signify the importance of waste sites outlives human ability to distinguish them, in case life from another planet reaches earth or if the sites disappear to reappear later (as with ancient cultures). For the signification of nuclear waste—and other abstract and temporally evasive phenomena—the re-presentation of the waste, the sign vehicle, must be *like* the object (the waste); it must have a similarity with the object (58). Van Wyck's example, while a bit dramatic, speaks to the real issue of meaning and intelligibility that is always at stake during practices that involve spatial, temporal, discursive, and material factors. The "arbitrary" examples found in

Newsweek's list—and the role of semiotics and language in meaning-making—become less arbitrary as we apply signification practices to make meaning out of known and lesser know places, by establishing a familiar similarity to direct experiences and recognizable media exposure. Popular media, like scientific instruments, help engage materiality by re-presenting data in a multitude of forms.[75] Returning to Latour's theory of transmutability, "the circulating reference," performs the task of carrying a degree of "material" consistency (similarity or identity, perhaps) through a series of semiotic moves. These moves, warns Andrew Pickering, suggest that there is "no difference between human and nonhuman agents" and that the agency "can be continuously transformed into and substituted for one another" (*Mangle of Practice* 15). Pickering's statement echoes the concerns of many scholars who argue against the power of representative forces from giving voice to or removing voice from that which is represented. Yet, with this apt critique in mind, the emphasis should be placed on the role of semiotics in the process of meaning in which humans are made aware of nonhuman materiality as separate from social construction. Signifying practices, as part of the performance, are not immune to nonhuman intra-actions, but simply provide a degree of human intelligibility to nonhuman materiality. Latour's circulating reference translates material to semiotic, not as a means of equating human and nonhuman "things," but as a meaning-making process by which humans are aware of the nonhuman—in human terms, but as nonhuman entities, actors, and agents.

The circulating reference, according to Latour, describes a series of translations from material to sign (and back) by which the consistency of the material object (the-thing-in-itself) remains, not in resemblance but in "coherence and continuity" (58). Core samples from the Arctic become data on the World Wide Web, for example, with little question to the continuity of the ice. Through the translation from one thing to another, the goal is to retain some compatible

[75] See Andrew Pickering's *The Mangle of Practice: Time, Agency, and Science*, especially pages 6-7 in which the author claims that machines allow scientists to cope with material agency by capturing data.

meaning.[76] The performance that changes ice to digital data and back to "ice" (as the data signifies it *is* a core sample), retains some continuity of the material properties of the "ice" and "ice-as-data" or "data-as-ice" as the material consequences and implications on the Arctic are gleaned from the ice-to-data-to-ice-to-perception-of-ice movement. In the process the matter of the ice will change (through melting, evaporation, contamination,), but as Latour argues, this matter will subsequently be "regain[ed] a hundredfold in the branching off to other forms that such reductions—written, calculated, and archival—make possible" (55). Matter as material-semiotic signification provides a variant, a cultural product that contributes to meaning. Yet, as Pickering, among others, argues, "[t]here is no thread in the present that we can hang onto which determines the outcome of cultural extension. We just have to find out, in practice, by passing through the mangle, how the next capture of material agency is to be made and what it will look like" (*The Mangle of Practice* 24). And, it is through this practice (and performance) that the circulating references are an addition to the thing itself, a variant articulation of materiality. Put another way, the references of Latour's theory act as a Deluzian and Guattarian "tensor," an always-ongoing variation that intra-acts forward and backward through the process of meaning-making (*A Thousand Plateaus*).[77] The circulating referent facilitates the transformation of things to signs (Latour 48) through which phenomena become intelligible, not as a fixed meaning, but as a natural/cultural extension, a variation, and a re-presentation of the nonhuman and ultimately a part of the performance and articulations that form material consequences. Understanding the material consequences in intelligible, "understandable" terms, as they relate to human and nonhuman, does not preclude nonhuman considerations, but simply confirms

[76] While Latour claims the meaning is retained, I argue that some semblance, or at most a mapping is retained. Whether or not the meaning is retained is subject to manipulations in the translation and interpretation, ultimately the consequence of the object's reception in any given temporal context.

[77] In the chapter on digital technology, I provide more details and an example of the "tensor." Here, generally speaking, material-semiotic intra-actions produce a deterritorialization of "fixed" matter by generating dynamic variants, which reterritorialize material consequence and meaning by rippling through and against the "fixed" matter. See *A Thousand Plateaus: Capitalism and Schizophrenia* for more about the tensor.

that, as Van Wyck argues, society determines meaning and action, not nature (*Signs of Danger* 86-89).

The conclusion worth drawing, then, is that signifying practices are not a surrogate for the material but an intra-action in which humans are more aware of the nonhuman world. Moreover, the translations Latour addresses do not project an equal as Pickering suggests, but, as Haraway claims, a material-semiotic consideration in which a material nature is not separated from a semiotic culture nor is nature a result of cultural practices ("The Promises of Monsters"). The goal is to connect the re-presentative factors (and not necessarily those on the surface) with the material content, through similarity, continuity, and so on.

2.8 Material Conclusions

Returning to Marshall McLuhan's "tetrad," the articulations of material-semiotic objects aid and hinder meaning-making as they paradoxically:

1. Enlarge or enhance
2. Erode or obsolesce
3. Retrieve what was earlier obsolesced
4. Reverse or flip when pushed to the limits of its potential (*Global Village*).

The direction for the rest of the dissertation project is to examine material consequences and meaning-making through the mediums of language and digital, computer technology in order to illustrate how we must also think critically about the remote ways (through time, space, distance, mediation,) in which intra-actions occur at the "ground" (far/large/scale)—the globe—and the "figure" (near/small/scope)—individual changes—both temporally unrestricted. Language and digital technologies, while providing more "direct" and intelligible connections to the material world also run the inherent risks of eroding and obsolescing, as McLuhan suggests, matter and materiality. Although not a guaranteed solution, approaching these media as material-semiotic performances intra-acting with materiality regardless of time or distance, alleviates much of the power struggle that critics warn removes nonhuman materiality. We must grant that, as Timo Maran claims, the nonhuman world is the foundation from which our meanings come, and that these meanings are in correlation with the material environment

(467). Maran's assessment, to quote Peter C. van Wyck, suggests a meaning-making (and the avenues through which it is produced) as a "kind of theory within an ethics of responsibility, of care. It is an acknowledgement that to say *there are only perspectives* is not to deprive subjects of knowledge, rather, it speaks to the ethics involved in claiming to any perspective" (*Primitives in the Wilderness* 134). When considering the double fold of materiality (that there is a materiality apart from and a part of humans), we have a better chance of resisting the temptation to speak for nature (or climate change) or silence the object in the re-presentation of it (135).

Through examining her own political approaches to materiality, Jane Bennett offers an apt criticism: that a materiality acknowledging "human meaning" in material objects only reifies the anthropocentric divide. Quoting at length, "For some time political theory has acknowledged that materiality matters. But this materiality most often refers to human structures or to the human meanings "embodied" in them and other objects. Because politics is itself often construed as an exclusively human domain, what registers on it is a set of material constraints on or a contexts for human action" (xvi). I walk a fine line with Bennett's point in this project. To consider that materiality has meaning because of human understanding and interpretation is not correct. At the same time, however, to forward that human understanding is unequivocally influenced by the nonhuman world does not really get to the political situation in the world. While I think both human and nonhuman factors are always already at play, much of the work in this project address human language and digital practices. Thus, one could argue that my barometer is shifted a little more anthropocentrically. Nevertheless, anthropocentricism can be productive. Bennett argues that although her politics support "the agentic contributions of nonhuman forces … We need to cultivate a bit of anthropomorphism—the idea that human agency has some echoes in nonhuman nature—to counter the narcissism of humans in charge of the world" (xvi). This is my attempt here in this project.

Addressing human/nonhuman materiality via the material-semiotic means recognizing the layers of intra-action in the material world and how humans approach this through meaning and knowing. Albert Borgmann examines the role of information in our attempts to make sense and organize the world. He states that information (helps) displays reality. Natural information (leaves, river banks,) exists in nature. Cultural information (maps, records,) addresses reality more widely and inclusively than natural signs. Technological information adds information as reality (as well as information about and for reality). The three types of information: natural, cultural, and technological, work together, fold, and layer among one another. They interact and produce 'information' (1-4). Borgrmann's treatment of information as a guiding principle in meaning-making highlights the intra-action between human, nonhuman, and mediating source. Moreover, the exchange underlines the inseparability of human and nonhuman materiality in the process of understanding. Thus, for climate change, meaning is gathered from the natural (landscapes), cultural (attitudes), and technological/semiotic (digital productions, signifying practices) not as separate or building, but as reverberating across and through the information structures that help articulate material consequences.

Materiality-as-meaning-making is necessarily inclusive, regardless of the categories used to mark the actors in the process. Bennett, in her political argument for nonhuman agency and affect, suggests that cultural objects solicit reactions from humans as both agency and affect are material catalysts that act rather than being passive recipients (xii-xiii). Karl R. Popper, moreover, forwards the idea of three worlds as a theory of the connectivity of nonhuman, human, and human productions. The first world (world 1) contains the material and natural world, including the environment. The second world (world 2) reflects the world of the human, the social world, psychological states. The third world (world 3) is the product of the second (in relation to the second and first) housed in books, libraries, and other knowledge sites, essentially abstract products not reducible to our psychology (*Objective Knowledge*). In spite of the division between worlds and entities, Popper maintains that exclusion is not the

focus. As humans work to make meaning of climate change, the natural world (world 1) affects and is affected by the social world (world 2), which then in turn produces artifacts (world 3) that affect the social world (world 2) and by proxy the natural world (world 1). Whether readers will actually venture to the glaciers in Iceland or other exotic locales captured in *Newsweek*'s list of places to remember before they are gone, the re-presentations contained within the artifact affects readership by making readers think about their place on the planet and how what they do affects a place they may never visit. The material consequence produced is not directly *at* the glacier, but a more localized action—such as driving less—that has global, albeit abstract implications.

Whether defined by "worlds" or material-semiotic articulations, in the later chapters my focus will be on the roles of language and digital, computer technologies that augment materiality and make it more intelligible through intra-actions that transcend time, space, and distance, and are critical in the production and acknowledgement of material consequences.

Chapter 3 examines language and semiotics as intra-active performances with the nonhuman world. Language is, perhaps, our most revealing source for gauging the world and has been paramount in climate-change discourse. The material consequences of language surface through action and, ironically enough, more discourse. Analyzing language use necessarily means exploring the sign, signifier, and the signified and even the source of the process itself, in rhetorical terms, the audience, author, and purpose. The very abstract, and overwhelming composition of climate change produces equally complex understandings of the sign, signifier, and signified as well as the rhetorical situation. Materiality is never truly lost; however, the temporal, spatial, and cultural considerations of examination stretch and challenge physical and tangible notions of materiality. Thus materiality-as-meaning-making becomes important as a means of recognizing the material through re-presentations and how material consequences articulate from less tangible and even unintelligible workings.

Chapter 4 examines meaning and consequences through digital applications. Like chapter 3, chapter 4 continues the theoretical examinations provided in chapter 2 and applies them to real-world and practical examples. Digital, computer technology, ubiquitous in most societies, continually proves to be the most frequent and diverse form of accessing the world. Whether through digital imagery that re-presents the world or more textually based approaches that promote discourse, digital technologies have all but replaced "being there," they augment traditional notions of "reality," mixing users participation on and offline. For climate change studies, this distanced connection proves useful as, once again, the complexity of climate change requires millennia of information and study and globe-spanning scrutiny. "Digital materiality," then, is a theoretical construct that analyzes the digital connections to the material world and how users are still very much connected to material consequences in spite of the "distant" a-temporal connection. Digital materiality is a practical approach that recognizes the need to take seriously digital re-presentations of the material world, not as exact copies, but as variant articulations within the intra-active process of meaning, understanding, participation, and action.

In concluding the dissertation project, chapter 5 attempts to place the undertakings of the previous chapters into a classroom setting. The setting, partially hypothetical as well as based on experience, examines early first- and second-year college courses on writing and literature focused on environmental issues. These courses serve as a prime arena for examining how students engage with and understand the material world as well as how language and technology influences and is influenced by their approaches. As students come to understand how these media are important to their engagements with the world, they also challenge the media themselves. More importantly, they come to recognize the role of rhetorical practices in their navigation and reception of their lived experience.

CHAPTER 3

MATERIAL LANGUAGE

3.1 Overview of the Chapter

The previous chapter concludes with a light reading of Karl Popper's theory of three worlds to point at the blending of human and more-than-human considerations in human approaches to the world. In addition, Popper's theory stresses the material-semiotic artifacts that are a part of the meaning-making process and material consequences that emerge within/from tripartite interactions.[78] Environmental influence on human action and human artifacts is affected by direct human action as well as actions intertwined with or by artifacts. Material-semiotic artifacts are critical in re-presenting material objects not only for identification and meaning but also for political and cultural considerations. In the previous chapter, I also concluded with Peter C. van Wyck's exaggerated, but nevertheless real, example of labeling nuclear waste sites for future generations through signifying practices. In this example, the signifying elements are as important as the material signified; moreover, the sign/signification becomes more critical as the future potentially weakens the tether between the material signified and the signifier. The waste remains relatively the "same" dangerous material; however, the sign and meaning fluctuate with each passing generation. In the following chapters, I will address the signifying practices of language and technology not only as objects themselves (words and images) but also as they function within the process of meaning-making. Félix Guattari, like Karl R. Popper, offers a working theory that triangulates the connections between human and nonhuman into three categories, which incorporate the "tools" of the signifying practices I will address. Like Popper's three worlds, Guattari proposes three ecologies: ecologies of the mind, the social, and the natural. The ecologies, then, are the mental states of individuals, the social relations/conditions,

[78] Worth repeating, the categorization of human, nonhuman, nature, culture, language and so on groups "things" for examination but does not limit the porosity and flow of the objects of examination. Categorization makes discussion possible but it in no way (at least in this project) limits the interactions of "things" with and beyond the page.

and the non-human/physical environment, respectively. Guattari claims that engaging with one's mental ecology can improve the conditions of the social (rights of individuals) and the natural ecologies (environmental problems). Guattari proposes what he calls "ecosophy," an ecology-based philosophy, and argues that the development of the mental ecology is crucial to the environment, and this development will then resonate through the social and environmental ecologies, improving the general conditions of the world (*Three Ecologies*). While neither Guattari nor Popper completely neglect the natural/physical world, they appear to share the view that the nonhuman world and human perception of it is greatly influenced by human thought and practice. In other words, in these scholars' theories, the "worlds" are inherently connected through the human experience, which is the basis for all considerations about the natural world (but certainly not material intra-actions). Though Popper does not directly claim a need to develop the human mind, his argument makes clear that human experience enables the natural and man-made worlds to connect through human perceptions and actions (including the production of artifacts about the natural world). This is not to say that the natural world does not intra-act, influence, or dramatically alter humans and the products of their minds and culture, but that through the products of human minds and culture the natural world is recognized in human terms. While risking a certain degree of anthropomorphization or one-sided relationship between human and nonhuman, the following chapter seeks to examine the products of the Guattarian ecologies and Popperian worlds as modes of meaning-making without isolation from nature. As was clear in chapter 2, the nonhuman world has a heavy hand in human understandings of it. Guattari and Popper show how humans are (de)centrally located within the folds of the world. In a practical example, environmentalist Bill McKibben explains how a separate, non-human nature no longer exists. "Nature is Dead," claims McKibben:

> By the end of nature I do not mean the end of the world. The rain will still fall and the sun shine, through differently than before. When I say "nature," I mean a certain set of human ideas about the world and our place in it. But the death

> of those ideas begins with the concrete changes in the reality around us—changes that scientists can measure and enumerate. More and more frequently, these changes will clash with our perceptions, until, finally, our sense of nature as eternal and separate is washed away, and we will see all too clearly what we have done. (*The End of Nature* 7)

McKibben's statement underlines the force of Guattari's and Popper's tripartite world as connected and inescapable. McKibben explains the consequences of a certain set of beliefs and binaries that places humans outside of nature and the world they create.[79] Applying the Popperian and Guattarian theories of "ecology," we understand that human ideas (world 2/mental ecology), though never truly separate from the nonhuman world (world1/natural ecology), become less clear as independent or removed from the nonhuman world (world1/natural ecology) as we better recognize the mutual influence we have on the nonhuman world and it has on us (world 3/social ecology). Here, the natural world, while still holding ties to traditional categories of "nature," is perceived by humans and reflected in artifacts which challenge humans to reconsider the natural world and define it accordingly, while also (hopefully) acting toward the natural world and on and on. Although in theory one can apply the Guattarian and Popperian divisions, and they are extremely beneficial in theorizing divisions in human relations, in practice the divisions do not exist, or at the very least the divisions are so

[79] The discussion of "beliefs" occurs throughout this chapter and at points later in this dissertation project. The recognition of "beliefs" and their "guiding force" in our interaction with the world cannot be understated. With this in mind, I want to quote Pierre Bourdieu's description of "symbolic power" and it's treatment of belief because I feel it rightly informs our interactions with power and the world. Bourdieu states, "Symbolic power is an aspect of most forms of power as they are routinely deployed in social life. Power is transmuted into a symbolic form, thereby endowed with a kind of legitimacy that it would not otherwise have. The terms 'recognition' and 'misrecognition' play an important role here: they underscore the fact that the exercise of power through symbolic exchange always rests on a foundation of shared belief. The efficacy of symbolic power presupposes certain forms of cognition or belief, in such a way that even those who benefit least from the exercise of power participate, to some extent in their own subjection" (*Language as Symbolic Power* 23). Without commenting too much, Bourdieu's statement underlines McKibben's suggestion that consequences and binaries are a result of a set of beliefs. While later in this chapter the discussion of "beliefs" becomes more positive, it is worth pointing out now how shared beliefs can, in fact, undermine environmental progress.

intra-dependent that to separate them makes little sense. In fact, *The End of Nature* proves an apt example as an artifact of Popper's world 2 and a product of Guattari's mental ecology. The book was considered the first popular treatment of climate change, and although many of the problems McKibben addressed still exist more than 30 years later, the book has had tremendous impact on the natural world (through human action) and cultural considerations and definitions of climate change and nature. The point here, then, is that although the book has no "direct connection" to the natural world (aside from raw materials in its production and the physical books' inevitable decomposition) it has incredible material implications for the natural world. As Lawrence Buell remarks, "the subject of a text's representation of its environmental ground *matters*—matters aesthetically, conceptually, ideologically. Langue never replicates extratextual landscapes, but it can be bent toward or away from them" (*Future of Environmental* 33).

In the following chapters I want to focus on the conventions of language and digital computer technology, the third world of Popper's schema (and Guattari's similar treatment) to illustrate how these "artifacts" or "technologies" facilitate a materiality with *meaning*. While not entirely possible, and certainly less tangible, through first and second world application, this materiality has meaning which has very real material implications and consequences in Popper's third world. The "tools" of language and digital computer technology provide a materiality-as-meaning-making that is a variation of the material and certainly a part of the process of intra-action.[80] Without commenting on the truth of certain scientific discourses or digital imagery, these re-presentations must be "real" and material because of the material consequences that ensue. I will examine Kevin Porter's theory of "meaning consequentialism"

[80] In other words, climate models and discourse, while very much real (and arguably more significant) are a variation (or an augmentation) of the experiential data that humans receive simply through contact with the natural world. Experiencing a summer that has above-average temperature provides direct, bodily contact with climate change. Data from less tangible media such as language and technology are direct, certainly, but they also provide a variation (through the transubstantiation of abstract data) of the corporeal experience of warm weather.

as it relates to material consequentalism in language use. The consequences, while not fixed, provide the meanings to the discursive process. As is clear from McKibben's "death of nature," meanings of nature that treated it as isolated, pristine, or untouched by humans have altered drastically as the consequences of our actions upon the planet have significantly (and drastically) altered the composition of nature. Conversely, treatments of nature that continue to hold it apart from humans or beyond the scope of human influence have had negative consequences on environmental actions as the treatments cast doubt upon the ability of humans to alter the natural landscape. I will also examine Donald Davidson's theories of "triangulation," the subjective, objective, and intersubjective approaches to the world. Davidson's theory of triangulation holds that people share a common and mostly true set of beliefs about the world. That is, while varying by degrees, a general consensus of beliefs is held throughout populations and cultures. Because there exists a consensus of beliefs, language use, and rhetorically positioning appeals, people imply "a" definition without solidifying meaning. When the trailer for Al Gore's *An Inconvenient Truth* claims that the documentary is "by far, the most terrifying film you will ever see" (adding emphasis to the statement by using all capital letters), the creators of the film position the statement to shock, grab attention, and capitalize on commonly held beliefs about what is terrifying—the end of the world, specifically—and what the audience has experienced in their, past, present, and future lives that would be more terrifying.[81] Thus, while the meaning of the statement is gauged by the consequences, the creators of the film bank on a general belief of like meaning that will move the audience. Finally, I will turn to the semiotic theories of Umberto Eco and Roland Barthes, whose works on semiosis analyze the difficulty of language representation with a system that allows for the perpetual deferral of meaning and signification. Nevertheless, within the system of use, signification is gleaned within a process that recognizes the object, the sign(s), and the

[81] Christina R. Foust and William O'Shannon Murphy argue that climate change discourse usually falls into two categories: "apocalyptic rhetoric" and "dismissive rhetoric."

interpretant (which can then become a further sign) within a particular construct. McKibben's "death of nature" signifies the end of an antiquated thought about the natural world and man's influence upon it in the industrial age, but its meaning is ultimately assembled in the process of its use (the "object" it signifies, and how it is then interpreted, becoming an additional sign). In an example taken from popular advertisement, the Italian clothing company Diesel's slogan, "Global Warming Ready," from its 2007 ad campaign of the same name, awkwardly forwards a climate change message that is uncertain at best. While it should be no surprise that a clothing manufacturer employs exaggerated ideals of fashion, beauty, and image, Diesel's message is further confused by these standard tropes that have dominated the advertising landscape for decades. In the advertisements, the "object" of climate change is signified through exaggerated landscapes of iconic or familiar locales "ravaged" by climate change and the attire of the models, which fits accordingly with the backdrop of the altered landscape. There is, without a doubt, little connection to climate change other than the "Global Warming Ready" slogan and the altered landscapes—such as a tropical beachfront at Mount Rushmore—that are really only signified as "climate change" by the slogan. The intepretant, because it is determined by the sign-vehicle, becomes "idealized," at best, as the models interact with an archetype of a fashionable lifestyle within the post-climate change world. The idealization becomes a sign itself and almost usurps climate change awareness with common and worn tropes of fashion and body image:

Figure 3.1 Image of Diesel's "Global Warming Ready" campaign at Mount Rushmore.

The absurdity of the advertisement is furthered if one considers that even in the most extreme cases of sea level rise, Mount Rushmore would not be inundated nor would it become tropical. Thus, signification and meaning are strained. Returning to Popper's theory, as an artifact of human production, the advertisement re-presents a skewed image of climate change and forces a potentially negative effect on the natural and cultural worlds and their connections as the ad all but dismisses action for blind acceptance and fashionable appearance. This move places the human above the nonhuman, once again locating the natural world in the position of backdrop for human endeavors. Climate change is another storm, which we must be prepared to weather… and make sure that we look good along the way.

3.2 Representation and Loss

Figure 3.2 Image of René Margaritte's painting: "The Treachery of images," taken from the Foucault society.

In his work on representation, based on René Magritte's famous painting: "The Treachery of images," perhaps more familiar as "This is not a pipe," (ceci n'est pas une pipe.), Michel Foucault argues the futility of the use of language in representation and its ability to attach singular (and totalizing) meaning. Magritte, himself, was noted for his indication that the image is not a pipe because one cannot perform actions that define a pipe; for example, the pipe/image cannot be filled or smoked (Torczyner 71). While both Magritte and Foucault argue valid points about the ambiguousness and complexity of direct material correlation between language and object, the problem remains that language does provide material consequences to immaterial actions and entities. This holds true especially for environmental issues that *must* have representation or otherwise escape recognition. While critics can argue that a painting of a pipe is not a "pipe," a more direct materiality must be recognized in discursive and imaging practices that express environmental issues. In other words, scientific discourse about climate change *must* be climate change, or, as I have argued previously, must re-present climate

change as part of the meaning-making process. While certainly not a one-to-one correlation, language "is" climate change as it frames, shapes, and is influenced by the material happenings of the phenomenon. As Verena Andermatt Conely suggests, "Signs do not cause the world to disappear, but they do inflect and shape it…the physical world never completely vanishes. To the contrary, it is seen to persist, even to *win*, over the abstraction of language irrespective of technology" (*Ecopolitics* 29). Yet in spite of the persistence of the world, there is no "winning over," as Conely suggests, but rather an intra-action between nonhuman, human, and language in a meaning-making process that shapes but does not dictate the world or place humans above it. The re-presentation of the pipe does not pre-determine or un-determine the image or materiality association with it. That is, the association of a pipe or the potentiality of a pipe, gives individuals pipe-like associations. On the literal level, the image of the pipe adds a layer of familiarity and meaning to pipes that one already has because they are a part of the world. On the philosophical level, viewers are posed with questions such as identity and existence, which stir internal responses with material associations.

As I argued previously, one speaks as *part* of the environment (by not viewing a division between the environment and culture), but this does not imply that we speak *as* the non-human world. Consider, for example, I can speak as a part of a society, but I cannot speak as that part of the society that is African American, female, over the age of 70—i.e., that part that is not my being. I can only attempt to speak with a general understanding of and toward their unique positions and my exposures to and connections with them—just as Magritte's image cannot completely represent an actual pipe. The painting can, however, garner perception as pipe-like, a variant invoking same understandings of what a pipe is as well as meaningful consequences of an actual pipe (desire to smoke, appreciation of the form, cultural norms of pipe smoking). As Cate Mortimer-Sandilands argues, humans cannot speak as nature nor provide the "truth" of nature (though she argues that this should not discourage them from entering a political dialogue). Mortimer-Sandilands calls for "humility," stating,

> certainly, such a humility is a guard against the possible claim that nature's interests are perfectly served in human democratic discussion; it leads us to an attitude of carefulness, of respect, of fallibility. To respect the limits of discourse is to avoid the authoritarian and totalizing claim that we "got it right"; it is to keep different forms of conversation going, to preserve the lack of closure that democracy requires. (206)

Mortimer-Sandilands' argument suggests a nature that exists, has agency, and even "speaks," though not in human language. She further claims that through experiences with the nonhuman world, humans can better approach and represent this nature. Citing Lori Gruen, Mortimer-Sandilands writes "actual experiences of the nonhuman world will create better knowledge of nature and can only help make more informed judgments about our relation to it" (93). Moreover, no "one" voice for (or from) nature exists; rather, it is an involved identity formed actively through material intra-actions between complex (and often conflating) experiences within the nonhuman. Nature, as an identity, can never be fixed; it will always lack a unique signifier and symbolization. Humans give a "voice" to nature, but nature gives voice to humans. For example, in chemical hazards and intelligible phenomenon, science becomes the voice of diagnosing and understanding. As Mortimer-Sandilands concludes, "environmental hazard lurks in everyday human consciousness as the product of a scientific voice that can experience nature tangibly and translate it into other realms of human comprehension" (76). Although as the reception of climate change has shown, even the direct correlation of science, as a "voice," and the nonhuman world proves increasingly difficult to understand for many people because of the disparity between the experiential and the abstract. Moreover, the intelligibility provided from science and the voice it facilitates (both human and nonhuman) are often unsettling as the population faces difficult realizations about lifestyle choices and interactions within the world. The idea of nature can bring notions of happenings, as I stressed in the previous chapter, but it

can also bring notions of origins, birth, and other ambiguous ideas that distance people and further indecisiveness. As Charles E. Scott points out,

> while 'nature' might intend the concrete and shared specificity of things and organizations of things in *their* occurrences, the meanings of 'nature' also include a broad experience of drawing away from the concrete specificity of things and their happenings. The word's meanings often draw us to an abstracting process rather than to the lives of things in their nondiscursive, dynamic interactions.…'nature' … often signifies a kind of subjectivity as well as a seemingly timeless coherence and continuity, a purposive process that manifests something either whole or striving for wholeness, a process that has completion in, as it were, mind. Or it can signify something systematically comprehensible; something with a definitive beginning that is compatible with intelligent observation and articulation. (23)

Information about climate change comes through language, technology, and cultural norms; and while there is a direct connection with the nonhuman world, knowledge of it does not guarantee if or how like (and unlike) objects will give shared meanings, or how shared awareness will come from disparate objects. As Albert Borgmann claims, "Once awareness has become the measure of information, it seems to follow that one and the same awareness can be the result of different kinds of external circumstances" (12).

Our information used to be wrought predominantly from signs in the natural world, perhaps providing a more direct correlation between the human and nonhuman. Today, however, much of the information, especially about complex environmental issues, relies upon information more immediately culled from cultural and technological arenas (Borgmann). It is not too much of a stretch to suggest that much of the current understanding of the radically altering climate originates from scientific discourse, which is then distilled into less specialized treatments (such as *An Inconvenient Truth*). In the past, this information was entrenched within

the discourse of science and all but unavailable to the average person. Recently, however, the public has become more involved and better informed about the climate crisis as the language and role of information moved out of the realm of science and into public discourse. Part of this shift, of course, comes from the transition of scientific discourse into visual models, less specialized discourse, and common narrative.

Language use, while still connected to the material world, cannot help but communicate abstract notions of "language about language" (such as translation of scientific discourse into general terminology) and/or "potentialities and actualizations" (such as experiential referents and significations and those that "may" happen). Descriptions of the phenomenon of climate change range from the direct materiality of the "extensional meaning" (pointing at a glacier that has receded three miles) to the future potential of a less material referent ("in 2050, all but one percent of glaciers will have melted"). Once past the extensional meaning, the referent becomes more and more abstract, utterances describe utterances, and language can be about language. Nevertheless, abstract language provides a luxury, as S.I. Hyakawa points out, because it allows us to describe broader concepts and to delimit more specific, concrete objects within the concept. But, in spite of this luxury, the "words—the way we use them and the way we take them when spoken by others—largely shape our beliefs, our prejudices, our ideals, our aspirations. They constitute the more real and intellectual atmosphere in which we live—in short our semantic environment" (11). When the semantic environment decouples from the natural environment, language becomes privileged over materiality, which causes trouble as discursive notions of climate change outweigh material experiences.[82] Language can obfuscate the

[82] Few examples better illustrate the degree to which language plays a role in representing climate change and the material world than the "editing" of government climate reports during the George W. Bush administration. The editing replaced or removed wording and writing that expressed certainty about the correlation between greenhouse gas emissions and climate change. Instead, the edits cast uncertainty or downplayed the links and consequences of climate change and weakened the direct, material correlation that climate data supported. See Andrew C. Revkin's June 8, 2005, and June 10, 2005, articles in the *New York Times*.

material by making it unintelligible, hyper-intelligible, and far too potential.[83] The phenomenon being studied becomes entrenched in the discourse, scientific and/or narrative, replacing the materiality of lived experiences, both human and non-human. As Robert Markley claims, "[s]ince its inception in the seventeenth century, our 'modern' understanding of climate has been characterized by a crucial tension between semiotics—both discursive and mathematical—of representing catastrophic events and an embodied experience that resists all forms of representation" ("Causalities and Disasters" 104). Language, numbers, data, and digital re-presentations have become the standard of climate change characterization and representation because of the belief that these means produce a more "authentic" re-presentation.

3.3 Language

While providing a definition (or historical treatment) of language is a labored and lengthy task, I would like to sketch, briefly, some considerations of language as I address it in this project. My concern with "language" in this project is less about what it "is" and more about its function within and connections to the material world. Rather than a fixed entity or object, language is an ongoing action that is a part of living in the world. Steven Yarborough puts it best by stating

> 'Language,' in the structuralistic sense we usually mean by the term these days, is, of course, the last great metaphysical illusion. In our field, 'language' is equivalent to divinity in theology, or, more appropriately, 'intelligent design' in biology. In fact, however, language is just a theory to explain how we make sense of the noises, marks, and gestures we use in order to communicate, a theory we tend to treat as a real entity. ("Very idea" 492)

[83] Think of ingredient labels. Labels, while providing ingredients of a product, make the contents unintelligible as the word removes the material of the product but also makes the contents hyper-intelligible as ingredients are listed down to the sometimes-unpronounceable derivatives. Take maltodextrin for example. As an intelligible ingredient, the materiality of corn is lost as the focus is on the designer sugar—maltodextrin is unfamiliar as a corn product; it is not enough as corn. As a hyper-intelligible ingredient, the materiality of corn is again removed as corn and (re)presented in its overly processed form—maltodextrin is corn concentrate; it is too much corn.

Language is a theory that explains the practice of communication between individuals, objects, and the world. As Donald Davidson argues, "what our words mean is fixed in part by the circumstances in which we learned, and used, the words. … the basic connection between words and things, or thoughts and things, is established…by the causal interactions between people and parts and aspects of the world" ("Knowing One's Own Mind" 29). Like Yarborough, Davidson supports a less rigid, fixed notion of language that exists beyond our uses of it (i.e., a "divine" or "beyond") instead of existing within our uses and because of them.[84] Individuals "practice" language and are informed by their social, political, cultural, and environmental settings.[85] "Private languages" do not exist because such a language would be impossible to interpret correctly or incorrectly. Donald Davidson argues against a private language, claiming that exchanges between like "creatures" (his term) is necessary to language (and to thought, according to Davidson). He states, "Belief, intention, and the other propositional attitudes are all social in that they are states a creature cannot be in without having the concept of intersubjective truth, and this concept one cannot have without sharing, and knowing that one shares, a world, and a way of thinking about the world, with someone else ("The Second Person" 121).

Davidson claims that "subjective," "objective," and "intersubjective" knowledge "form a tripod" (211) and facilitate our understanding of the world (broadly speaking). Not too dissimilar to Popper's three worlds, these three types of knowledge indicate an understanding of self,

[84] Language does have, however, certain "established" conventions that inform users and language practices, but conventions such as grammatical syntax can also cause problems. For example, as Rudolf Carnap argues, grammatical syntax allows the same grammatical form for meaningless word sequences as it does for meaningful word sequences ("Elimination," 69). The argument here, though, is that in spite of any established conventions (good or bad), language as meaning producing and language as a part of the material world is more productive when taken as an interactive process between individuals and the world and as something that facilitates "communicative sense" (to take from Yarborough).

[85] As Willard Van Orman Quine so eloquently states, "different persons growing up in the same language are like different bushes trimmed and trained to take the shape of identical elephants. The anatomical details […] will fulfill the elephantine form differently from bush to bush, but the overall outward results are alike" (*Word* 8).

others, and the world and principles of charity. A principle of charity, according to Davidson's theory, suggests people share mostly true beliefs about the world.[86] Davidson's theory adds a layer of analysis to the theories I have discussed thus far. As a very reductive explanation, the three types of knowledge indicate a process of meaning and understanding that is based upon multiple potentialities within the individual—or individuals—and the world. For Davidson, "all three varieties of knowledge are concerned with aspects of the same reality; where they differ is in the mode of access to reality" (205). Quoting at length, Davidson explains that

> First person knowledge is distinguished by the fact that we can legitimately claim a unique sort of authority with respect to what we believe, want, intend, and some other attitudes. Second person knowledge and knowledge of the rest of the world of nature do not have this authority, but they differ from each other in that our knowledge of other minds is normative in a way that latter is not. All three varieties of knowledge are, however, objective in the sense that their truth is independent of their being believed to be true. This is obvious in the second

[86] It can safely be argued that I have too far extended Davidson's original intent of the theory of three types of knowledge by applying it to large-scale (and oftentimes amorphous) environmental issues as Davidson's theory appears to implicate human communication practices in all three legs of the tripod. While my project argues for the knotted connections of the human and natural world, I may in fact be taking liberties with Davidson's theory. Nevertheless, as I have attempted to argue in the project, seemingly "natural" environmental issues, as well as those more clearly caused by humans, always already have human interactions associated with their existence, whether by cause, understanding, or meaning. Thus, intersubjective and objective knowledge—the two legs that seem the least applicable to "nature"—contain the specter of human activity. For example, science provides an "intersubjective" approach to nature. While humans and nature may not technically "share" a "true" view of the world, research shows how nature responds to human action. Similarly, while nature cannot have beliefs, at least what humans consider beliefs to be within a cultural context, we can observe "true" and "false" interactions between human and nonhuman entities (for example, when someone believes that cutting off oxygen from a plant will not harm it). More importantly for this project, I take the legs of Davidson's tripod as imbued with human and nonhuman interaction as expressed with technology and language. When I view a climate simulation I know (a) what I think (subjective); (b) what others sometimes or in general think (intersubjective); and (c) the world around me (objective) including human and nonhuman factors. Finally, within the complex connectivity of language, technology, and interaction I think it possible to argue that each leg of the tripod becomes a branched tripod itself containing the scaffolding of the entire triangulation: other levels of the subjective, intersubjective, and the objective.

> two cases, but it holds even in the case of beliefs about our own beliefs and other attitudes: such beliefs can be wrong. All our knowledge is also objective in the sense that it could for the most part be expressed by concepts which have a place in a publically shared scheme of things. ("Introduction" xiii)

The premise of Davidson's theory rests on the understanding that first person knowledge contains "a presumption—an unavoidable presumption built into the nature of interpretation—that the speaker usually knows what he means. So there is a presumption that if he knows that he holds a sentence true he knows what he believes" ("First Person Authority" 14). This presumption gives the speaker a "first person authority" in which interpreters assume that the speaker holds mostly true (and shared) beliefs about himself and the world. Thus, Davidson's theory of first person knowledge is based upon interpretation and his understanding that the beliefs of the speaker must be (mostly true, but certainly prone to errors) or we would not be able to interpret them:

> An interpreter of another's words and thoughts must depend on scattered information, fortunate training, and imaginative surmise, in coming to understand the other. The agent herself, however, is not in a position to wonder whether she is generally using her own words to apply to the right objects and events, since whatever she regularly does apply them to gives words the meaning they have and her thoughts the contents they have. ("Knowing One's Own Mind" 37)

Yet, Davidson argues that first person knowledge and authority is "identifiable without reference to objects or events outside of the body"; and at the same time, can be ascertained by "casual relations to events and objects outside the subject" ("Knowing One's Own Mind" 20). Moreover, argues Davidson, "the correct interpretation of what a speaker means is not determined solely by what is in his head; it depends also on the natural history of what is in the head" ("The Myth of the Subjective" 44). To this later point, Davidson stresses that speakers must select their

words to fit within the conventions of established within communities and social groups if they wish to be interpreted correctly ("Knowing One's Own Mind" 28) and in terms of subjectivity:

> Thoughts are private, in the obvious but important sense in which property can be private, that is, belong to one person. And knowledge of thought is asymmetrical in that the person who has a thought generally knows he has it in a way in which others cannot….So far from constituting a preserve so insulated that it is a problem how it can yield knowledge of an outside world, or be know to others, thought is necessarily part of a common public world. Not only can others often learn what we think by noting the causal dependencies that give our thoughts their content, but the very possibility of thought demands standards of truth and objectivity. ("The Myth of the Subjective" 52)

In a concluding phrase, Davidson bluntly states, "But there is a *presumption* that I [know what I mean by my words], since it does not make sense to suppose I am *generally* mistaken about what my words mean; the presumption that I am not generally mistaken about what I mean is essential to my having a language—to my being interpretable at all ("What is Present to the Mind" 66).

As I attempt to lay out in this project, the mode of access to climate change varies (though all are connected) from discursive explanation to digital re-presentation to first hand experience—even if on a limited time scale. What is productive about Davidson's theory, if only taken on a reductive level, is that it grants—like the theories discussed in the previous chapter—the materiality that ties together our understanding of the world and the natural, specifically. Susan Hekman argues that "Davidson wants to bring the world back in by emphasizing the obvious: that we presuppose the existence of [the] world in everyday life" (*The Material of Knowledge* 31). In other words, our understanding of, and connection too, nature is influenced by our interactions with other people, the impressions world leaves upon us, and

ourselves (our own prejudices[87]), which are incorporated into the loop of understanding about the natural world (and others and ourselves and so on).[88],[89] As with Poper's tri-part "worlds" the

[87] Worth noting, though not in great detail, is a distinction about the term "prejudice." Normally taken to denote negative meanings ("racial prejudice," for example), the term, according to Hans-Georg Gadamer should reflect something more positive. He argues, in "The Universality of the Hermeneutical Problem (1966)," that "prejudices" guide our ability to experience and "are simply conditions whereby we experience something—whereby what we encounter says something to us" (9). In other words, a prejudice directs our approach or "openness" (Gadamer's term) to the world and our ability to engage with new experience based upon our old ones. See also Gadamer's discussion of prejudices in *Truth and Method*.

[88] While Davidson acknowledges the existence of a "natural world," i.e., a world filled with non- and more-than-human entities (not his terms), human "influence" on nature may be too overstated and misdirected. I think Davidson would agree that humans "influence" nature if we take "influence" to mean leaving a footprint, mark, or other indication on the material environment (such as a strip mine or a reclaimed landscape). However, Davidson would probably have contentions with using the term "influence" with the same meaning and indication as humans do to one another through the exchange of thoughts, beliefs, and cultural rituals. Put another way, Davidson stops short of identifying propositional attitudes to the non-human world. In his essay "Rational Animals" (and less explicitly in other essays), Davidson considers rational animals as having "propositional attitudes such as belief, desire, intention, and shame" (95). And while he recognizes cases in which animals may appear to have these attitudes (or we attribute these attitudes to animals through our observation) and even species in which a "grey area" exists, overall Davidson identifies propositional attitudes with humans because to have these attitudes one must have a belief, which requires the concept of belief, which requires language (102). He does claim, nevertheless, that he "see[s] no reason to be less kind to those without thoughts or language than to those with; on the contrary" (96). Admittedly, I may have overstated the use of Davidson's tripodial theory of knowledge and its part in the larger process I have been working through, especially as I have and will argue the mutual influences between human and nonhuman (Davidson would attribute this to a sensory response in animals and not propositional attitudes. He would most likely not extend any response to inorganic matter). In spite of this potential flaw, Davidson's theory goes a long way in addressing the role of the world in our approaches to it because the theory argues three types of knowledge and their interdependence. I do not presume that Davidson would grant agency to the natural world (at least with certain definitions); but while perhaps not agentic, Davidson does acknowledge the significance of the natural world in meaning making. Finally, Davidson's approach to the theory is one of human cognition, meaning, and understanding. He claims that although personal attitudes are developed within a "social nexus" of individuals and within the natural world, each individual is "free" within the social nexus, in the end each individual plays the "role of final arbiter" ("Irreducibility of the Concept of the Self" 91). Davidson's point and focus is that the types of knowledge he describes are human and come from humans even with a respect and recognition of the natural world. While here is not the place, one could certainly contest Davidson's claims about animal rationality with a number of theories, some of which are implied in this dissertation project. My concern here is the triangulation of subjective, objective, and intersubjective knowledge in navigating amorphous and less-than-concrete phenomena in environmental issues while using language and digital technologies.

[89] Although not addressed at length in the body of this project, Davidson's prior and passing theories are worth noting as they exemplify the in situ meaning-making that underlines this dissertation. In "A Nice Derangement of Epitaphs," Davidson argues against a "structured

always-ongoing movement between persons, places, ideas, cultures, and interpretations, Davidson's theory helps peel away the layers that make up our conceptions of life within the world. Davidson rightfully assumes that we must have a world and be a part of the world in order to have meaningful exchanges. To know oneself and to know others *and* to know about the world necessarily means that a material world exists from which speakers can gauge meaning and understanding based upon the aligning of beliefs between speakers and shared aspects of the world. Perhaps best summing up Davidson's theory and its relevance, I quote Davidson at length:

> The basic triangle of two people and a common world is one of which we must be aware if we have any thoughts at all. If I can think, I know that there are others with minds like my own, and that we inhabit a public time and space filled with objects and events many of which are (through the ostensions which made such thoughts available to us) known to others. In particular I, like every other rational creature have three kinds of knowledge: knowledge of the objective world (without numerous successful ostensions, I would have no thoughts); knowledge of the minds of others; and knowledge of the contents of my own mind. None of these three sorts of knowledge is reducible to either of the other two, or to any other two in combination. It does indeed *follow* from the

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language" positing instead a language that indicates the exchange between speakers in the contextual moment of the exchange (446). Much of Davidson's theory is contextual; that is, meanings will be porous between conversations and between speakers. For Davidson, speakers have an idea of what each other will mean in advance of the conversation, while the passing theory indicates how the speakers interpret one another during the conversation. Davidson states, "For the hearer, the prior theory expresses how he is prepared in advance to interpret an utterance of the speaker, while the passing theory is how he *does* interpret the utterance. For the speaker, the prior theory is what he *believes* the interpreter's prior theory to be, while his passing theory is the theory he *intends* the interpreter to use" ("A Nice Derangement of Epitaphs" 442). Moreover, Davidson argues that, of the two theories, "the passing theory is the one that the interpreter actually uses to interpret an utterance, and it is the theory the speaker intends the interpreter to use…The passing theory is where, accident aside, agreement is greatest." Davidson concludes that the passing and prior theories become more in tune as the speakers continue (442).

> fact that I have any one of these sorts of knowledge that I have the other two since the basic triangle is a condition of thought, but none is conceptually or temporally prior to the others. (87).

Susan Hekman attributes Davidson's presupposition of the world as a metaphor of a "background"; that is, the material world is a background within which human endeavors take place (*The Material of Knowledge* 70). While attributing the material world as a "background" can carry negative connotations—i.e., the world is behind, secondary, to human action or a "backdrop" from which human action takes place—I don't attribute either theorist as intending negative connotations. For Hekman, the material world is an active part of human and nonhuman development and action. For Davidson, the world is critical (and required) for knowing oneself, others, and the world. Without it, there would be no language: "We would not have language or the thoughts that depend on language […] if there were not *others who understood us and whom we understood*; and such a mutual understanding requires a *world* shared both causally and conceptually" ("Locating" 303, my emphasis). The material world is an active tether from which life is understood (both human and nonhuman).[90] Supporting the very logical platform Donald Davidson has constructed, Susan Hekman argues that disclosures bring reality to light and that each disclosure has "different material consequences." Nevertheless, these consequences can be "compared" in order to "make arguments about which ones are more useful" (92). Thus the material consequences of less-than-material actions produce outcomes that are ultimately decided (or ignored) by the complex imbrications and implications of human and nonhuman interactions.

[90] Stephen Yarborough, borrowing heavily from what he terms as Davidson's "discursive interactive theory," argues against what he describes as a dualism that separates "rhetor" and "audience" as well as dispenses different "laws" for "things" in nature and cultural artifacts such as language ("On the Very Idea of Composition" 492, 493). Put another way, Yarborough suggests that "It's not just that we learn how to use language in the same way we learn how to get around in the world—they are the very same process" ("On the Very Idea of Composition 495).

3.4 Meaning and Material Consequentialism

Davidson states, “An interpreter cannot directly observe another person’s propositional attitudes; beliefs, desires, and intentions, including the intentions which partly determine the meanings of utterances, are invisible to the naked eye. The interpreter can, however, attend to the outward manifestations of these attitudes, including utterances” (“Three Varieties” 210). This idea extends into Kevin J. Porter’s theory that meaning is the consequences propagated by an utterance or text. In other words, meaning can be taken from the consequences of the actions that manifest the beliefs and desires of the individual and cultural artifacts. But, “correct interpretation [requires],” according to Davidson, “that an interpersonal standard of consistency and correspondence to the facts applies to both the speaker and the speaker’s interpreter, to their utterances and to their beliefs” (211). In his essay “Irreducibility of the Concept of the Self,” Davidson sketches his triangulation theory of knowledge and communal interaction. He comments about the role of interpretation in understanding and how often times we interpret correctly in spite of errors (word choice or grammar, for example) that occur in the communication process. For Davidson, interpretation, within this structure is less of an “observed process” and more of a “transition from input to outcome” (“Irreducibility” 90). This transition, for Davidson, is based upon an inability to reduce the self. I understand the speaker because of my criteria of understanding and meaning I have developed over my lifetime, this is not to say; however, that these criteria have not been heavily influenced by others and the world. My criteria are objective (but not always correct) because they have been developed within other social interactions with others and within a shared world (90-91).

For Porter, questions of meaning are often times neglected, assumed, or passed over entirely. Porter’s theory of meaning consequentialism opposes static, a priori treatments of meaning in which the meaning of an utterance or text can be located earlier in time to the utterance or reading of a text (or that meaning is “intrinsic” to the utterance or text [13]). That is, meaning does not precede listeners or readers in time, nor does meaning exist metaphysically,

atemporally, or in an absolute time, but rather meaning is "constituted within" time (251). Quoting Porter at length, he argues

> the Meaning of a text is not a blueprint for the construction of appropriate consequences determined for all time, but the temporally distended result of those consequences….[T]he Meaning of a text is not its prior 'depths,' but its subsequent dilation and exfoliation of consequences… [T]he apparent inertia of texts and meanings is a product of effort, not momentum…. [And] the act of reading is neither recovery of the Meaning, nor invention of the Meaning, but an act of expropriated immediation that constitutes through time, not all-at-once meaning or set of meanings of a text. (124)

Porter wishes to assign meaning of texts and utterances to their consequences as well as to the propagation of meanings that they produce (17-18). "Meaning consequentialism" stands against "meaning apriorism,[91] "the assumption that the meaning of an utterance or text is always to be found in or grounded by something prior to that utterance or text or to any interpretation of the utterance or text" or bound to the past or objects in the past (11, 43). Ultimately, the meaning of text or utterance is gauged by a posteriori constraints. Porter states, "*We should rule out meaning of a text (from our own vantage at a given point in time and space) not by identifying*

[91] Stephen R. Yarborough critiques what he feels is a false dichotomy between apriorism and consequentialism in Porter's theory, claiming they are not "logical opposites" and the logical opposites would be aposteriorism and causalism, respectively ("Review"). While the critique is worth consideration, it seems that Yarborough has fallen into the "meaning apriorism" trap (though perhaps not incorrectly) of assigning meanings (and categories). For example, while we don't know what "consequentialist" propagations Yarborough personally experienced, as a reader, I am inclined (given the scope of this project) to consider apriorism as a viscous-porous "beginning," "starting point" (in the very active, "process" sense) in which the limits of meaning are not fixed, but, perhaps, faintly sketched. If, as a consequence, "apriori" means "beginning" to me, then an (non-fixed) "ending" is a pragmatic consequence (aposteriori constraints), even if that "ending" serves as another starting point for future endeavors of meaning. This does not suggest a linear progression of meaning or a "link" in the chain of meaning, but rather, as Porter states, meanings are "anterior to" not "pre-given for" (53). In the end, Yarborough's critique may be unavoidable; nevertheless, there is a way, I think, in which assigning apriorism and consequentalism together speaks clearly to the logical and pragmatic manner in which we gauge the propagations of meanings.

meanings that are impossible for it to have had, have, or ever have, but by identifying consequences that it has not (yet) had" (62).

Porter's meaning consequentialism is a welcome addition to the theories and practices discussed in this dissertation project. The theory addresses the meaning of the very real consequences of environmental issues and the technologies and languages used in approaching those issues and constitute these issues. Physical manifestations aside, the material consequences of climate change rhetoric have real and significant meanings (even if these meanings are distended, as Porter terms, through time).[92]

As I discuss in the dissertation project, climate discourse and science often extend the present into the past and future (as well as any combination of the three) with the consideration that what we do now affects the future and in order to understand present (and future) climate considerations we must look into the past for data points and other indicators. In other words, climate change requires a broader consideration (broadly considered) of "time." Porter argues that "Speakers and writers can only predict or hypothesize meanings, not master them: The meanings of an utterance always exceed our grasp. The consequences of an utterance are unknowable in advance because they are not determined in advance: An utterance does not contain its consequences which the passage of time subsequently reveals…. We are always confronted by the physical—as well as phenomenological—uncertainty of the event horizon of meaning" (54-55). Porter further suggests that no matter how hard or "faithfully" one tries to ensure and project meaning, "*the consequences of utterances and texts are always unforeseeable, even if one makes accurate predictions about some of those consequences*"

[92] We can again turn to the example of the George W. Bush Administration's editing of climate change documents. The administration, with the intention (a characteristic of meaning apriorism) of uncertainty, attempted an aprioristic reading of the documents that held to negative associations of doubt and probability and thus having consequences that range from loss of funding to climate change skepticism. While consequentialist readings of the unedited documents may have resulted in similar outcomes, the administration's move illustrates the binding of meaning and consequence to one another and the seriousness of meaning consquentialism in environmental issues.

(261).[93] As this relates to climate change, it is uncertain and unpredictable to gauge (or guess) future meaning based upon future consequences. As many of the polls in this project have indicated, the "meanings" associated with the consequences of environmental issues have not remained static or predictable (looking anteriorly, not apriorily, the economic crises essentially altered what should have been very predictable responses to the surge in environmental [especially climate change] activism and change of the previous years). In spite of the unpredictability of the future and future meaning, consequentialism helps articulate meanings that are not immune to constraints (decided, I suppose, politically or otherwise) or shackled to a priori ends.

Porter's meaning consequentialism and Hekman's disclosure pursue similar ends. Both theories suggest that human endeavors and cultural artifacts are considered under the consequences they produce. Quoting Hekman at length:

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[93] Stewart Brand has what I think to be a complementary theory to Porter's argument of the inability to see into the future to find meaning because Brand argues against looking to the future for meaning, opting instead to re shift our focus on time in order to position ourselves (and the planet) for the future. Summarizing his book *The Clock of the Long Now* at length: Brand acknowledges an acceleration of time where people live in the "no present" with little cognition of (or room to even think about) the past or present. The past is gone. The future is immediate, though hardly tangible. People live in the now both temporally and physically. "The clock of the long now," a term coined by Brian Eno, attempts to place time, the future and the past, in a more holistic concept that acknowledges that human civilization is located in the middle of what happened and what is to come. There are still temporal and physical ties to early farming cultures that propagated the development and dispersal of mankind on the planet and the potential futures of civilizations that develop "modernly" or are "futuristic" when compared to mankind's roots. Brand's "time" focuses six significant levels of pace and size. From the fastest to the slowest the levels are: art/fashion, commerce, infrastructure, governance, culture, and nature. For the author, culture is where the long now operates because its slow progression keeps century and millennium time. Culture is the work of whole peoples; one can leave contemporary city life and travel to rural farm villages—"centuries behind modern man." Similarly, Tokyo has been lauded as a technological and future, and one can step "into the future" by experiencing the technological culture of Tokyo. The long now supports a sustainable, slow approach to man's place on the planet. Brand argues that most disasters happen fast while most construction takes time. Thus, for the ecological and cultural sake of the planet, humanity needs to look into the future in order to realize that humanity cannot predict the destiny of the planet but can give the future the tools and a position. Brad states, "Giving up any hope of accurately predicting the future allows for increased responsibility and alleviating disputes (we don't agree on the present, but we need to agree on the future) as groups deliberate of possible future they may share…. We don't know what's coming, but we do know we're in it together" (118, 123).

> Disclosures have real material consequences. To disclose is not to reveal the true objective reality of an object. Rather, it is to engage in a complex practice in which multiple elements interact, or intra-act, to produce an understanding of the reality that we share. … we can weigh the material consequences of one configuration over another. In contrast, linguistic constructionism forces us to conclude that every story is just a valid as any other story. … We can argue that certain disclosures have material consequences that are beneficial, others that are not. We still cannot argue for absolute truth. But we can make arguments grounded in the material consequences of the disclosure we practice (*Material of Knowledge* 93).

3.5 Semiotic Applications

I would like to mention briefly how certain theories form the field of semiotics (often used synonymously with language studies) exhibit similar applications for the material questions this projected is after. While not representative of the entire field, those semiotic theories that focus on tri-part system as well as the connection between the sign and the material world add an extra element to materiality and meaning making. Semiotics, the study of signs and their (intra) relations to the world fits well with the process of re-presentation, meaning, and understanding of environmental issues that I am attempting to lay out.[94] As Daniel Chandler posits, "Semiotics is concerned with everything that can be taken as a sign" (2). Put simply, signs must have a direct correlation, significance, or relation to the material (concrete and ambiguous) world and human intra-actions with(in) it. Peter C. van Wyck states the material-semiotic problem of representation best using the example of nuclear waste and the difficulty in attributing a

[94] I have included a brief and cursory examination of semiotics because, of all of the categorical theories, I think it most closely fits with the meaning-making moves that I have outlined in my examination of language. One could, however, suggest that other interpretive theories at some level allow and require similar considerations. Hermeneutics, for example, can be viewed as a multi-part relation between reader, text, and the world with each node informing and influencing the other. While never separate, all three can be examined as necessary to interpretation and meaning making.

"similarity" between the sign vehicle and object—nuclear waste (*Signs* 58). If the sign does not reflect the object, meaning and understanding may be lost or skewed. While the level of similarity must be culturally identifiable, the degree of "likeness" van Wyck stresses is highly subjective. For instance culturally associated symbols such as the biohazard sign and the "mister yuck" face are instantly identifiable in spite of their dissimilarity to the "toxic" objects they represent. In another example, bar graphs, data points, and color charts may not be "like" climate change, but these methods of representation are readily associated with rising temperature and warmer regions of the globe. Viewers can easily compare the height difference of bar graphs and the "warmer" colors associated with temperature to grasp a similarity between warming trends and planetary conditions. Thus, in a sense, "similarity" is a constructed likeness; and in many cases, *more* identifiable than the object itself. But this does not mean that the sign is completely arbitrary or detached from the world. As Daniel Chandler details in his treatment of Saussurean semiotics, arbitrariness is one of degree and not completeness. Chandler maintains that "arbitrary" signs have meaningful connections to the objects they signify. Both the "mister yuck" face and the reds and oranges of temperature maps have long standing cultural associations with "harmful" substances and warmer temperatures respectively. Moreover, both signs have connections with material consequences as the "yuck" face signifies bodily harm (and possibly death) and the warmer colors signify potential impacts upon the body (and other objects). Chandler summarizes that "The Saussurean legacy of the arbitrariness of signs leads semioticians to stress that the relationship between the signifier and the signified is *conventional*—dependent on social and cultural conventions which have to be learned" (28, see pages 22-28 for more of Chandler's discussion of arbitrariness).

In *Elements of Semiology*, Roland Barthes describes language (Saussurean *langue*) as "both institution and system" and speech (Saussurean *langage*) as the "individual act of selection and actualization" of language (*Elements of Semiology* 14-15). He further contends that neither language nor speech can exist without the other: language is the blanketing

structure from which speech blossoms while continually pollinating the ongoing language system. After entertaining ideas from other scholars, Barthes comes to the conclusion that the language/speech dialect can be applied to nonverbal communication. He states, "there exists a general category *language / speech*, which embraces all the systems of signs; since there are no better ones, we shall keep the terms *language* and *speech*, even when they are applied to communications whose substance is not verbal" (25). But through his examinations of commercial systems (garment and food to name two) Barthes finds the problems of the arbitrariness of the sign and the potential disproportion between language and speech (31-33).[95] Barthes concludes that "a third, pre-signifying element, a matter or substance providing the (necessary) support of signification" must be added to language and speech (33-34).

The presence of a "material," then, provides an added support to the argument in this project that language is founded in material considerations. If I have not misread Barthes too terribly, I can make extrapolations between Barthes, Davidson, and Porter. Barthes' material acts as a part of the world as well as a part of shared beliefs in the Davidsonian triangle. Language, likewise, holds a similar (but not exact) role as world-like (in that we operate within it) and a shared belief (a shared language). Speech encapsulates the triangulation process of exchange between persons and their shared beliefs of the world. When applied to meaning

[95] Barthes argues that certain groups and not the "speaking mass" determine the sign and its significance within the operating system. Similar ideas can be found J.L. Austin in *How to Do Things with Words* ("infelicities" and "misfires" for example) and Pierre Bourdieu in *Language & Symbolic Power* (for example, class dictates speech). In addition, Barthes notes that in cases such as written accounts, speech is almost not existent because the written word is an account of the system of language (designated by the group) and the actualization of language. Nevertheless, Barthes contends that a "language without speech" is possible only because it is supported by linguistic speech (33). This claim, while endorsing the connections between language and speech in general, also suggests the traces between the text and the world that Laurence Buell argues and the three worlds concept Popper envisions. In Barthes' example, the "static" text (heavy on deterministic language) is connected to the social practices of language use (Bourdieu) and the commercial world in which the text is located in/taken from. Important for this project then is the interactions between elements that Barthes identifies and implies that compose meaning and materiality.

consequentialism, the argument is one of the arbitrariness of the sign. The sign, and its meaning, are gleaned in the consequences that propagate.

Umberto Eco, in *Semiotics and the Philosophy of Language*, argues that a semiotic approach concerns the relation between the signifier and the signified. This view, generally, posits a linguistic structure of action between pairs—expression and content. Semiosis, according to Eco's reading of Charles Saunders Peirce, involves three subjects: the sign, its object, and its interpretant (which can be extended ad infintium). Accordingly, this tri-part action "cannot" be resolvable between pairs. As such, it seems that one has to choose between a theory of the sign or a theory of semiosis (1). (Put differently, it is a choice between the significant practice or of the communicative processes of textual and discursive activity). It seems though that Eco has other ideas. For Eco the sign is the origin of the 101emiotic processes, and there is no opposition between the 'nomadism' of semiosis (and of interpretive activity) and the alleged stiffness and immobility of the sign. For Eco, this recognition begins with the untangling of the concept of the sign from "its trivial identification with the idea of coded equivalence and identity; the semiosic process of interpretation is present at the very core of the concept of sign" (1). Eco approaches interpretation as two possible extremes X and Y. X stands for the singular, authorial intent, the narrow view of interpretation as determined by the author. Y is the opposite, a theory of interpretation that entertains all possibilities of interpretation. Eco chooses a point in the middle. For him, interpretation is found between X and Y on the grounds of "a recorded thesaurus of encyclopedic competence, a social storage of world knowledge" (3). (This is Eco's idea of *isotopy* – the planes of possible actualization of a text. Note that these planes are not infinite as texts "display" a certain number of isotopies).

In order to approach the possibility of interpretation, Eco aligns semiotics with a philosophy of language, claiming that *general semiotics* is a philosophy of language and all philosophies of language are concerned with semiotic questions. Accordingly then, Eco distinguishes between two types of semiotics: General and Specific. A general semiotics refers

to the “study of the whole of human signifying activity—languages…[i]t studies and describes languages through languages. By studying the human signifying activity it influences its course. A general semiotics transforms, for the very fact of its theoretical claim, its own object” (12). A specific semiotics is concerned with the “grammar of a particular sign system, and proves to be successful insofar as it describes a given field of communicative phenomena as ruled by a system of signification (think poker or sign language) … these systems can be studied from a syntactic, a semantic, or a pragmatic point of view” (5). The two types of semiotics work together, the general often informs the specific. It is worth noting that, while aligning philosophy with a general semiotics, Eco claims that philosophy (and thus general semiotics) has practical power, but does not have predictive power. It cannot predict what would happen if the world were as it described it …it does not work on concrete evidence.

In reference to interpretation and meaning, Eco admits to three categories of meaning: “intended meaning” (the individual wants to say that he/she is something), “pictorial representation” (symbolic representation), and “inferential proof” (if the individual wears the sign, he/she must be a _____). In all three categories, the object does not stand for itself; it stands for something that is outside itself (20). This, then, leads to the concept that, “at the semiotic level, the conditions of necessity of a sign are socially determined, either according to weak codes (the link is not a necessary one) or according to strong codes (the link is a necessary one) (38). Eco maintains that if the conditions of necessity of a sign are socially determined, then interpretation can move, step by step through the entire circle of semiosis, *the criterion of interpretability*. Every interpretant (Peirce) besides translating the Immediate Object or the content of the sign, also increases the understanding of it.

In *A Theory of Semiotics*, Eco analyzes the requirements and conditions for a general theory of semiotics, one that will “explain every case of sign-function in terms of underlying systems of elements mutually correlated by one or more codes” (3). The general theory covers a *theory of codes* (abstract theories detailing the codes) and *a theory of sign production* (the

phenomena such as the common use of language, the evolution of codes, and aesthetic communication.).

The project of semiotics, for Eco, is "to study the whole of culture" (4). He claims, "[s]emiotics is concerned with everything that can be *taken* as a sign. A sign is everything which can be taken as significantly substituting for something else. This something else does not necessarily have to exist or to actually be somewhere at the moment in which a sign stands in for it. Thus *semiotics is in principle the discipline studying everything which can be used in order to lie.* If something cannot be used to tell a lie, conversely it cannot be used to tell the truth; it cannot in fact be used 'to tell' at all" (7).

Important for Eco's theory is the *communication process*: "the passage of a signal…from a source…to a destination." For non-humans, there is no signification, only the passing of information. However, in humans, there is a process of signification as long as the process arouses an interpretive response in the addressee. This process is made possible by the existence of codes. Notes Eco, a code is a system of signification, insofar as it couples present entities with absent units (8).

Of major importance in discerning communication and signification is that signification "is an autonomous semiotic construct that has an abstract mode of existence independent of any possible communicative act it makes possible" (9). Conversely, communication presupposes a signification system as a necessary condition. That is, every human communication depends on a signification in order for communication to exist (9).

Through Eco's understanding of Saussure (sign as a twofold entity: signifier and signified or *sign-vehicle* and *meaning*) and Peirce (sign as a threefold plus entity: sign, its object, and its interpretant [another sign translating and explaining the first one, and so on *ad infinitum*]) leads him to conceptualize the sign as "*everything* that, on the grounds of a previously established social convention, can be taken as *something standing for something else*. Quoting Morris, Eco writes "something is a sign only because it is interpreted as a sign of

something by some interpreter….Semiotics, then, is not concerned with the study of a particular kind of object, but with ordinary objects insofar…as they participate in semiosis." Eco modifies this definition slightly, claiming "interpretation by an interpreter, which would seem to characterize a sign, must be understood as the *possible* interpretation by a *possible* interpreter" (16). Though there are instances where signs are not present—such as physical events coming from a natural source and human behavior not intentionally emitted by its senders, in other words, *inferences* are not signs—"[t]here is a sign every time a human group decides to use and to recognize something as the vehicle of something else. (Eco uses the example of the first doctor to notice a relationship between red spots and a disease [measles] made an inference, a non-sign. But, the inference became a *semiotic convention* when the relationship was made conventional and registered in medical treatises [language community]).

Eco believes that plurality is necessary for a signification system to become a process of communication. Ideas are signs. But it takes two individuals to translate the ideas into *observable sign-vehicles*. Culture is important in this transaction. Culture adopts the singular use of objects (such as rituals and songs) as they are communicated through the inhabitants. Once the possible use of an object has been conceptualized, the object itself becomes the concrete sign of its virtual use. Once a society exists every function is automatically transformed into a *sign of that function*. This is possible once culture exists. But culture exists only because this is possible (Barthes) (24).

3.6 *An Inconvenient Truth*

In concluding this chapter, I would like to turn to two examples of language use (broadly conceived here) in climate change action. The "Al Gore"-focused documentary, *An Inconvenient Truth,* combines written, spoken, semiotic, and hermeneutic presentations in its demonstration of the current (2006) and future climate crisis.[96] The film also uses Al Gore's credibility as public

[96] Interestingly, and this is one of the weaknesses of this project and a number of environmental humanities scholarship, the categories of "speech," "discourse," "semiotics," "hermeneutic," and

politician as well as strong gestures of pathos (connecting his family life and 2000 election loss) to hook the audience. As a marketing tool, the film is a rhetorical masterpiece that capitalizes on Gore's personal struggles and accomplishments as well as the "shock" value of the presentation (through visualization) of hard science.[97] Nevertheless, Gore points out and discusses many of the connection between the material world and the political, economic, and social roots that extend into the broader climate situation. He posits the connections between insurance company losses and climate change, for example. Moreover, Gore illustrates juxtaposition between flooding and drought that has been proven but not always (or commonly) associated with climate change (see figure 3.3 and 3.4). In both of these examples, Gore connects the visual (and data-driven) signs that indicate climate issues. The parallel use of photographic and video imagery with data and computer models provides the emotional and local connections and the science behind drought, flooding, and their locations. Put simply, viewers see people experiencing floods or drought (that could be them or neighbors) and connected this to the data points on the map.

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other categories devoted to the examination of communication, meaning, and interpretation, tend to get lumped into the broader and more forgiving categories of "language," "signs," and "discourse." While I am guilty of such a move in this project, I think the environmental humanities need a critical examination of "language" that borrows from analytical philosophy, pragmatism, and logical positivism to name a few. While I would not predict the outcome of such a project, it seems that a more critical and profound examination would be essential for a theoretical movement that wishes to put the "material" back into language and materiality.

[97] Andrew Szasz, in *Ecopopulism* argues that television news "personalizes" issues. He states, "Television news reports shy away from complex explanation; social issues are, instead, dramatized and personalized" (61). Arguably, this sentiment is on full display in the documentary; nevertheless, Gore does employ hard and complex science (even though the "explanation" may not be complex). Where Gore and others (such as Bill McKibben) are successful is the melding the findings of science and the narrative of personal storytelling, which is almost unheard of in the oversensationalized world of news reporting.

Figure 3.3 Image of the juxtaposition of flood and drought occurrences in neighboring provinces. Taken from *An Inconvenient Truth*.

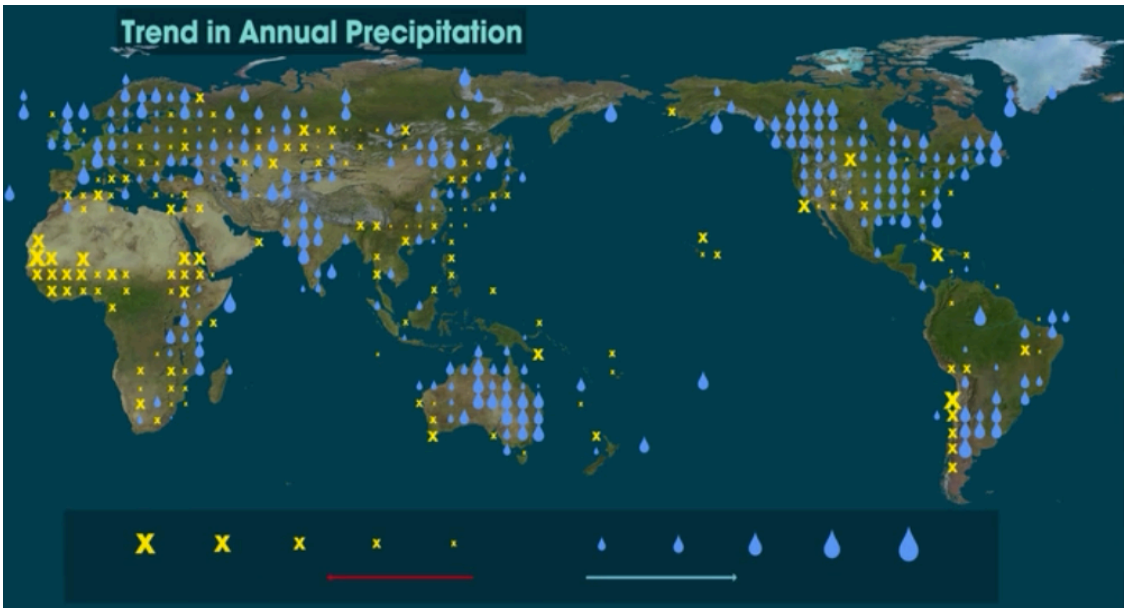

Figure 3.4 Image of "Trend in Annual Precipitation" which provides a more data driven presentation of the juxtaposition and similar occurring flood and drought that result from climate change.

Much of Gore's presentation is highlighted by line graphs illustrating rising temperatures and images showing a year-by-year account of glacial recession. The presentation is also shadowed by detailed presentations of data on a larger screen. This rhetorical move, one part entertainment, illustrates the "size" as it materializes the data and the actual weather. Gore's use of size and scale is an attempt to further inject materiality into his performance. Moreover, the film's use of visual data and physical performativity (see figures 3.5 and 3.6) help connect the discursive portion of the message and, while not solidifying certainty or meaning, provide a more direct interpretation. Gore's use of a motorized scaffold to demonstrate the rising rate of CO_2 over the next half century is a discursive and semiotic attempt to connect materiality to the "talk." When the audience (or viewers) sees the absurdity of the line that represents CO_2 compared to Gore, the hope remains that the audience will take action. Davidson claims, "You and I cannot come to agree on the interpretation of our sentences as a preliminary to using them to interpret others, for the process of coming to such an agreement involves interpretation of the very sort we thought to prepare for. It makes no sense to ask for a common standard of interpretation, for mutual interpretation provides the only standard we have" (83). Davidson's claim rings true with climate change because of the need for data and numbers and more "object" oriented representation (textual or image). Much of the discourse surrounding climate change, unless an experiential narrative, is based on the numbers of science. Thus, adding the visual elements, as the film does, established a more holistic presentation and "objectivity" for the audience. As Davidson says, "In the case of ordinary measurement, we use the numbers to keep track of the facts that interest us. In the case of the propositional attitudes we use our sentences or utterances. But there is this difference: we can mutually specify the properties of the numbers. The numbers, like the objects we apply them to, lie, as it were, halfway between ourselves and others. This is what it means to say that they are objective or that they are objects. It cannot be this way with our sentences" (83). While this project argues the materiality of discourse (and to extrapolate from Davidson's triangulation, discourse connected to the

objective world), Davidson's statements do ring true about our draw to visual, data-driven "evidence" and its "more direct" connection to the material world. The combination of discursive, visual, and data, provides a richer material context, and these moves speak directly to the material connections that this project advocates.[98]

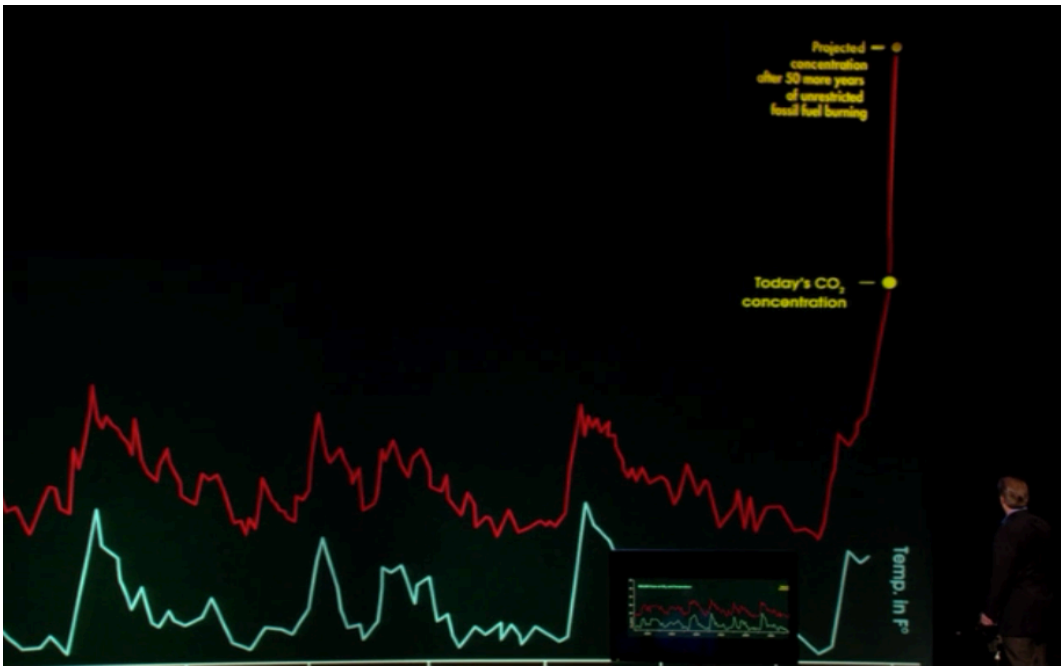

Figure 3.5 Image of data, text, and Gore's discussion of the spike in CO_2 in the atmosphere.

[98] The following chapter will address digital imagery in more detail. Here, the focus is on the as a sign in signification.

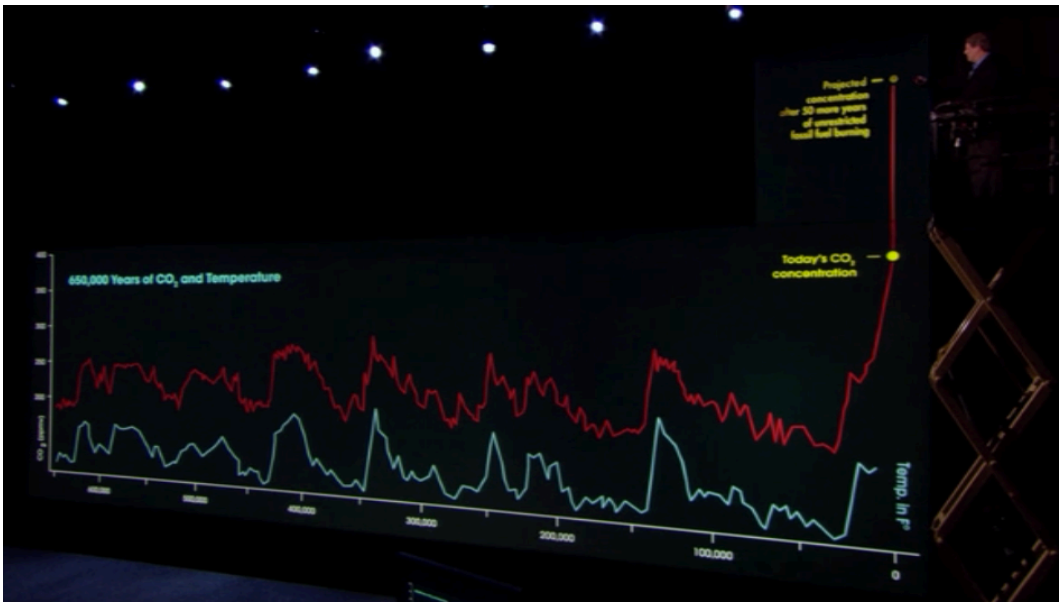

Figure 3.6 Image of Gore's use of physical performativity to further express his point and provide more exigence to the audience and (as the producers hope) more direction for the audience's interpretation.

Gore stresses the nation's scientific and technological ability to predict the future based upon the actions and information of the present. Gore recounts his early interests in climate change based upon the inspiration of a professor who "drew the connections" and "projected into the future where this was headed unless we made some adjustments."[99] Ultimately Gore's presentation uses line graphs, images, and the rhetorical messages that "we know what is and will happen. Why are we letting it happen?" In a personal moment, Gore recounts his childhood

[99] Worth pointing out, and hinted at throughout this analysis of *An Inconvenient Truth*, are Gore's explicit and subtle attempts to position himself as an authority and voice for climate action. Even though Gore's professional background is not one from the sciences or environmental policy, he continually attempts to convince the audience of his qualifications based on his interests and "involvement." This attempt, as Pierre Bourdieu argues, is to establish Gore's power and position as a credible spokesperson and knowledgeable individual. Bourdieu states, "the competency that speakers possess is not the capacity of a speaker to generate countless grammatically perfect structures but to produce expressions that are appropriate to being heard at a particular situation. The power lies in the ability to be heard and believed. Those who speak must ensure that they are entitled to speak in the circumstances and those who listen must reckon that those who speak are worthy of attention" (*Language as Power* 7-8). In this film, and beyond, Gore is positioning himself as an authoritative figure to which audiences (and skeptics) must listen.

on his dad's ranch and his connection to the locale and the very familiar activities of his or any childhood. He then comments "the places where people live were chosen because of the climate pattern that has pretty much been the same on the earth since the end of the last ice age 11,000 years ago." With this statement, Gore establishes a historical definition of migration and place. He continues, stating, "Here on this farm the patterns are changing, and it seems gradual in the course of the human lifetime, but in the course of time as defined by this river, it's happening very, very quickly." With his concluding sentiment, Gore seeks to uproot the standard (and accepted) notions of time as well as definitions. If Gore's first statement was an a priori definition of meaning, then his second (and more controversial) statement suggests a meaning consequentialist definition in which Gore understands the scales of "cultural" and "natural" time as defined by the consequences of climate change in correlation with the river (or other natural phenomenon) and not the standard human conceptions.

In many ways, *An Inconvenient Truth* can be viewed as a "meaning-consequentialist" film. In spite of all of the data, expert testimony, and experience the film uses to prove climate change, the film is a reminder of how the consequences of this evidence did not *mean* to the general public what the general scientific consensus took the consequences to mean. What Gore and company had hoped, and even thought, the consequences would *mean* to a larger audience was not the general consensus, as polls indicated that the importance of climate change lessened in the public's mind (see the polls referenced in chapter 1). And, although looking backward to a "fixed" meaning is the antithesis of meaning consequentialism, almost a decade since the film's release we find that the film's climate predictions were more certain than the hoped response from a larger audience. If numbers presented in the climate data are the "half way" as Davidson claims, then perhaps the "talk" of climate change needs to be more strongly associated with the numbers that underline it.

Gore, and the team responsible for *An Inconvenient Truth*, continues the "crucial tension" to which Markley refers ("Casualties and Disasters"). Clearly the film illustrates a

correlation between rhetorical emphasis and acknowledged experience. Volatile climate, in all of its forms, eschews a codified representation by its registry in human cognition as a physical, cultural, emotional, political across the scattered treatments by the public at large. By saying "the last five summers…" Gore is transubstantiating material properties into their discursive and symbolic variants, materiality with augmented meaning, as he attempts to bridge the difficulty of a complex event by applying to and highlighting the very immediate effects on human lives. The statement translates, identifies, connects, or sheds light upon material experiences, even if it has not been "experienced" by the public, into abstract referents that are further or more formally grasped by the audience. This statement then continues the material-semiotic dance of sign, sign vehicle, and sense, that MEAN, but are further in play as the meaning becomes another corner of triangulation and further meaning-making exercises. Returning to an example in the previous chapter, the discursive treatment and question process that one makes about the oddity of a white rabbit, whose fur had changed to better suit the snowy winters, against a brown, "fall" landscape solidifies a material-semiotic experience that is interwoven with material properties and discursive constructions and assumptions about the ecological state of Northwestern Montana. To be physically at the location, experiencing the clash between rabbit and landscape, means something on a natural and cultural level. To further pursue the meaning through discourse and re-presentations means something more in an attempt to augment first-hand experience temporally, spatially, and even on more humanistic levels of ethics and morality.

Gore's disclosure (or reminder) of the warm summer months extends consideration of what this change may indicate on a global scale of time and distance and also further generates meaning as sign and simultaneously as sign vehicle of what potential meanings may become materially. The exposure to the summer weather as happening becomes more intelligible via the discourse explaining, and giving it more direct and dire meaning, especially away from the present. Like Patagonia's blog post, Gore's discursive materialization extends climate meaning

beyond the local and physical into the global and abstract while exposing climate change to a larger audience. As Peter C. van Wyck argues about the nature of meaning:

> meaning is only found socially; that is, because of the invisible nature of certain ecological threats, only the social reception and approach of the threats constitute their meaning. Thus, causality becomes less important than the ability to creatively intervene within and among effects: *ecological threats can only find a meaning within the social*. (Thus becoming an issue of culture, semiotic, hermeneutic, philosophy, and language issues). (86-87)

3.7 Climate Change Fashion

An Inconvenient Truth exemplifies the idea that meaning can be found socially (as van Wyck claims) but also that meaning (and the resulting actions) are not given, but are rather a result of the propagated consequences (as Porter argues), good or bad. While Gore clearly explains what climate change means, and will mean, the larger public, at least if we follow the polls, thought differently.[100] A more brash climate campaign, Diesel's "Global Warming Ready," surfaced a year after *An Inconvenient Truth* during the zeitgeist of climate action (see figures 3.7 and 3.8). In reference to the campaign, Brandon Keim asked *Wired* Magazine readers "Does this Diesel ad campaign trivialize global warming, or represent the sort of jaunty, can-do, life-goes-on attitude necessary to confront a changing climate?" ("Diesel Global Warming Ready").

[100] And this statement goes back to the issue raised in chapter two about climate change and the rabbit in northwestern Montana; that is, the discrepancy in meaning between nature and culture and even between cultures. Certain sections of the world probably subscribe to the "meaning" (past, present, and potential future) that the data and experience suggests. Nevertheless, if we measure the consequences of this meaning by action (or legislation or some other cultural litmus test), the results are different.

Figure 3.7 Image of “Antarctica” from Diesel’s “Global Warming Ready” campaign.

Figure 3.8 Image of “London” from Diesel’s “Global Warming Ready” campaign.

As mentioned earlier, the images are ripe with geographic inconsistencies and the models don’t appear to be put out by the post-climate change world; quite the opposite in fact, they appear to be very happy. Says Libby Copeland, “That global warming is being spoofed by a retailer in the pages of *Vogue* and *Esquire* suggests that the issue is sufficiently widespread and accepted to have reached the irony tipping-point.… It was perhaps only a matter of time before a company like Diesel upended this with a perspective that is either humorous or insulting, depending on how you take it” (“High-Water Marketing”). Copeland also addresses the “surreal” landscapes, but quickly notes that the traditional conventions of style and body image are still the focus of the campaign. Much like Copeland, Keim points to the “absurdity” and “decadence” of the campaign as well as a less negative way of viewing and thinking about climate change. Keim argues that “[i]n their exuberant outlandishness, the ads carve out a little mental space where it’s possible for a few seconds to contemplate global warming without thinking about disease, disaster.”

Good or bad, climate change in a meaning consequentialist world solicits at least two responses from climate awareness campaigns such as *An Inconvenient Truth* and "Global Warming Ready." The first, and this is good, is that they challenge traditional (or a priori) meanings of "action" by redefining the meaning of "action" to one that more closely resembles "cause-marketing," "voting with the dollar," and, perhaps, "minimalist action." These consequences, although producing positive gains in climate mitigation, are quite different than the more aggressive and black-and-white tactics of boycotts and physical marches. This approach is clearly at work in Diesel's campaign, but also to a smaller extent in *An Inconvenient Truth*. During the credits of the film, a long list of minimal (but also significant) lifestyle changes is given. From changing light builds to buying a hybrid car, these changes require the consumer to spend, which is an action, but not really give up anything. Copeland says it best, "So a campaign that encourages the consumer to do something good, so long as that thing doesn't require changes in a glamorous lifestyle – such a campaign makes a lot of sense" ("High-Water Marketing"). Such a response, suggests then, that perhaps the meaning of climate change has not "changed," or that a larger population "accepts the meaning," but rather, consequences as they relate to action have. Moreover, the response could suggest an acknowledgement that the "pre-climate change world" that Gore and others dream of is a thing of the past. This a priori world is "dead" (as Merchant, McKibben, Cronon, and others suggest), and so living with nature, in a consequentialist approach, is living with the aposteriori limits of the consequence of the natural and cultural meanings of climate change. This view of a "new world," means, as Timothy Luke articulates:

> Nature increasingly is no longer a vast realm of unknown, unmanageable, or uncontrollable wild nonhuman activity. After becoming completely ensnared within the megamachinic grids of global production and consumption…Nature is turning into "Denature." Much of the earth is a "built environment," a "planned habitat," or "managed range" as pollution modifies atmospheric chemistry,

> urbanization restructures weather events, architecture encloses whole biomes in sprawling megacities, and biotechnology reengineers the base codes of existing biomass. (*Ecocritique* 195)

The second potential outcome of a meaning consequentialist world suggests that the world needs new ways of thinking about (and acting on) human/nonhuman relations. If we cannot predict the future based upon, or by feeling secure in, our past meanings, then perhaps our focus should shift to how the consequences or our meaning-based actions (if ever so little) actually mean something and (as Stewart Brand argues) position us for the future, even if we cannot see past the "event horizon of meaning" (Porter). Diesel may be doing just this. If Gore's approach represents a traditional fear-based approach, then "Global Warming Ready" represents an approach that takes itself less seriously. Both approaches have value, and both approaches want reform. Both campaigns urge similar ends, but have different paths to those ends. In a potentially ambiguous and defamatory statement, Libby Copeland quotes Diesel's creative director Wilbert Das as claiming that the company wanted to "present global warming in a 'positive context,'" because "People have become used to learning about global warming in a serious and science-heavy fashion…Spoofing the issue provides a 'bigger shock,' possibly provoking consumers to think more" ("High-Water Marketing"). Assuming Diesel's hopes are for consumers to make lifestyle choices that mitigate climate change, their approach says a lot about the uncertainty of fixed or predictable meaning. But, if this "shock" (what Kevin Michael DeLuca refers to as a "mind bomb"[101]) draws out consumer activism (even if a little), it further indicates that in a contemporary world the new tradition is non-traditional and that beneficial consequences can propagate from anywhere, no matter how ostentatious the message. Diesel's "farcical" advertisement might just provide the materiality of meaning to a demographic

[101] See DeLuca's book *Image Politics: The New Rhetoric of Environmental Activism*. The book focuses on how images jolt audiences into action or support for environmental causes. For the author, images take the identifying (or associative) elements from the past and connect them to new (and often times powerful) uses and interpretations in the present that force audiences to view things in a different way.

that cannot be bothered by numbers or scientific data. Their approach is the same narrative as Gore's: "climate change will bring a radically different world"; but where Gore wants to terrify, Diesel wants to prepare.[102]

Certainly I am taking liberties with my readings of Diesel's ad campaign. In fact, I do feel that the campaign is more detrimental than helpful because the focus is on the fashion (again, the world is placed in the background, and humans appear to continue without missing a step). But, if I am to speak optimistically in closing, I would add two things: First, I do think Diesel's ad campaign challenges us to think about climate issues. Regardless of their silliness, the ads do present much of the traumatic (at least by human considerations) geographical alterations of the planet that accompany almost every "serious" interpretation of potential results of a warming planet. The ads also, and without shame, present a "grotesque" version of consumerism and consumer fashion, especially because of the juxtaposition between runway-fresh models and stark landscapes. In this sense, the ads question our own threshold of "nonsense" and "tolerance" to climate change, and hopefully our responses (as consequences) mean we are willing to change. Second, when viewing *An Inconvenient Truth* and "Global Warming Ready," one encounters dramatic contradictions about our very "natural," "nascent," and "traditional" beliefs about the nonhuman world[103] and a more open (if not humble) potential for meaning and action to come from more diverse and less fixed positions.[104] We are in a better position then to perform, as Luke suggests, a type of "social ecology" in which "We must

[102] The idea of "preparation" comes up in the next chapter although in a more positive light.
[103] I would call these beliefs our "a priori" longings to have a picturesque, natural past, present, and future, which is overtly represented in *An Inconvenient Truth*. Taking from Kevin Porter's argument, these approaches what to extract a fixed meaning (and starting point) and spread it (consistently) over time (what Porter would call "panchronic" and "absolute" time). While not wrong, and certainly valuable, the question for this approach is the practicality or our ability to achieve it without significant (but not impossible) changes to our lifestyle.
[104] One of these positions, which I view with question, is Bill McKibben's and 350.org's (probably unintentional view) that climate change must be mitigated to 350 ppm of CO_2 in order for humans to live "safely." This view suggests that we can never go back to a "beginning" a pre-industrial age CO_2 limit, but we can reduce it (and *humans* can live safely). This view, I think, lies somewhere between *An Inconvenient Truth* and "Global Warming Ready."

seek the foundations for a more reconstructive approach to the grave problems posed by the apparent ‘contradictions’ between nature and society. We can no longer afford to remain captives to the tendency of the more traditional sciences to dissect phenomena and examine their fragments. We must combine them, relate them, and see them in their totality as well as their specificity” (177).

CHAPTER 4

DIGITAL MATERIALITY

4.1 Overview of the Chapter

Marshal McLuhan argued that newer media (and technology in general) adopts and adapts older media, a process that would later be termed as "remediation." McLuhan claimed that film became TV, books remediated speech and so forth; all media, at some point, refashion existing media (Bolter and Grusin, *Remediation*). The term "remediation" describes how media[105] refashions older, existing media to use in different, unique ways. "Old technologies, then, stay alive by assimilating new techniques as well as material. But they also confer symbolic meanings [containing] and important cultural side, even religious implications" (Tenner, *Our Own Devices* xii). Our lived experiences, although riddled with technological apparatuses, are often examined without the technology that supports them. Technological embodiment is important when thinking about how everyday technologies are employed (or affect) our bodies, actions, relations and so forth (ix). Technological embodiment mediates our lived experiences, not only those that are immediate but also those that seem far removed such as gauging climate change. The point then is that these media "have the same claim to reality as more tangible cultural artifacts" (Bolter and Grusin, *Remediation* 19).

"Confirming" climate change, although theorized over a hundred years ago, and a "hobby" for some scientists for many years, was a much more recent event. As Spencer R. Weart argues, more rigid attention to and support of climate change studies was not common until the second half of the twentieth century where the advancements in technologies, computers, and cooperation across the sciences gave the complexity of the phenomenon more

[105] Throughout this examination, I refer to "digital media" in a general sense, but with a focus on visual technologies and computer-networked systems. The definition of the term I intend is: "[d]igital media are forms of media content that combine and integrate data, text, sound and images of all kinds; are stored in digital formats; and are increasingly distributed through networks such as those based upon broadband fiber-optic cables, satellites, and microwave transmission systems" (Flew, *New Media* 10).

shape and validity.[106] Technology, one could argue, played a critical role in the conformation of the climate crisis. Although certainly material and real, climate change becomes "real"(ized) through (equally real) media technologies.[107] To quote Jay David Bolter and Richard Gruisin, digital technologies allow users to "get past the limits of representation and to achieve the real" (*Remediation* 53). The real, however, is not limited to the virtual, but is recognized as the "immediate (and therefore authentic)" response from the users and from broader cultural considerations at large (53). According to Michele Kendrick, the mix of users' material experience equates a "symbiotic and contentious [,] hence dialogic" relationship between humans, technology and the world (qtd. In Hansen, *Embodying Technesis* 15).

In this chapter, I examine how digital technologies couple with our actions in the natural world, contributing to our understanding and producing material consequence. The use of digital technologies is a performance, and if, as Edward Tenner claims, "we define *technology* as a modification of the environment, then we must recognize the complementary principle of *technique*: how that modification is used in performance" (*Devices* 4). Bolter and Gruisin argue, "media technologies constitute networks or hybrids that can be expressed in physical, social, aesthetic, and economic terms. Introducing a new media technology does not mean simply inventing new hardware and software, but fashioning (or refashioning) such a network" (*Remediation* 19). In this chapter, I will explore the basic notions of digital embodiment and mediation as a reality of theoretical observation as well as lived experience. Both exemplify what it means to "mediate," through devices and/or applications in any given system, in the

[106] Weart's *The Discovery of Global Warming* provides a succinct historical account of the process of science and the involvement of persons in the discovery and confirmation of climate change. My intent in this project is not to delve into the specifics of the process or rehash Weart's brilliant treatment of the history of climate change and climate-change science, but briefly point out the complexity of and delay in more widely accepted recognitions of and beliefs in climate change.

[107] Worth noting, however, is that the deluge of technology often causes problems, "revenge effects," as Edward Tenner terms them, that are essentially technology striking back at the user. His most prevalent example is the use of chemotherapy treatment that causes another form of cancer in the patient (*Why Things Bite Back*).

natural world, as well as perform in the process of materiality and materiality as meaning-making. As Pierre Lévy postulates, "the distinction between culture (the dynamic of representation), society (people, their exchanges and their relations of force), and technology (useful artifacts) can only be conceptual" (*Cyberculture* 4).

The context for this chapter is the consumer culture of the United States of America (as fleshed out in the introduction**)** and its approaches to climate change through the internet. I will examine the "visual" tendencies of science as expressed by Don Ihde. These visual tendencies—especially the visual imagery of data—couple with the visual design of the internet, to produce what scholars such as Mark Hansen and Pierre Lévy term as a "mixed reality" of virtual and material climate change. The mixed reality, however, relies upon a "digital materiality," which holds that unintelligible objects in the material world are made intelligible and have meaning by an augmentation or disclosure facilitated by digital technology. For example, the parts per million of greenhouse gases in the atmosphere are unintelligible without digital re-presentation. Unintelligible, invisible, or otherwise obscure objects certainly exist in the material world, but are not perceptible (or do not have meaning) until disclosed through mediated experience. The articulations between and through the connections of objects, events, and mediated lives prove critical to the theoretical schema of digital materiality. Interactions with the internet, mobile devices, television, and other devices comprise the networked systems of media (and events) that circulate, connect, and inform human experiences. Through digital materiality and the networked systems mediating our lives, cultural approaches are affected by readily accessible scientific discourse, images, and climate projections.

For users connected to the world through the internet and dependent on scientific discourse, climate change is less about the expert science and theory and more about the ability to sort through and address the connections between naturally and culturally significant phenomena permeating climate change. While the a/effects of climate change take place in the natural world, the phenomenon is partially a semiotic construction. That is, the technologies and

discourses make climate change intelligible and do, in fact, make climate change. While not a social constructionist approach, this argument suggests that the mediated connections are a significant part of how we (physically or not) experience the materiality of climate change and its material signification.[108]

4.2 Logging on Through the Body: An Introduction

My focus for the chapter is how digital technology has afforded a closer, more intimate look at climate change. My examination makes two assumptions: 1) addressing and/or understanding global climate change would not be possible without "digital materiality," the material phenomena of global warming made intelligible (and visible) through digital and visual technology; and 2) that in accepting the digital and visual connections to climate change, recognition must also be given to the tendencies and implications of a cultural progression toward virtual, digital, and data structures. In addition to science and technology, cultural approaches to climate change through digital applications are an important part of the process. As Terry Flew puts it, technologies must be understood as more than just "material forms that impact upon culture, but rather as themselves cultural forms" (*New Media* 30). The reciprocal effects of culture, science, and technology stress the process of the connection, that is, the connection itself, and the actual and/or potential material consequences. The process of connection includes both local and global considerations as digital technology augments our abilities to extend ourselves beyond our occupation of a physical place; or as Ursula Heise argues, to "ground any such discourses in a thorough cultural and scientific understanding of the global—that is an environmentally oriented cosmopolitanism" (*Sense of Place* 59).

Heise's declaration echoes Marshall McLuhan's classic argument that media extend our nervous systems into the world (*Understanding Media*). This extension, according to McLuhan,

[108] We tend to think about and measure climate change in material experiences such as warmer weather, drought, or sea level rise. Yet, mediating devices provide more intelligibility—through signification and not (necessarily) "material" experiences—contributing to a significant part of our experience with climate change.

allows users to better immerse themselves in the "happenings" of the world (*Understanding Me* 234). From Heise's point of view, a strictly local perspective (a local point of view), limits the ability to grasp the entirety of the situation (or as much of it as is possible). An environmentally oriented cosmopolitanism suggests a more total immersion in what McLuhan refers to as "happenings," or the "all sides at once with everyday involved" connection with the world (234). While McLuhan is concerned with the spread and speed of the electric age, Heise's global extension of senses provides a richer platform from which more diverse meanings and consequences are gleaned. Nevertheless, McLuhan's extension of the nervous system proves a spine to approach the cosmopolitan world-view that Heise advocates as his description of the nervous-system-into-the-world speaks to how we "react to the world as a whole" (*Understanding Media* 348).

Of course, how we react to the world has everything to do with how we act with it. Heise is correct in her call for a cosmopolitan environmental view; yet, her view underplays the place of embodiment as a means of appropriating (or being appropriated by) these global views. Because if, as Heise argues, "environmentalism needs to foster an understanding of how a wide variety of both natural and cultural places and processes are connected and shape each other around the world, and how human impact affects and changes this connectedness," then the places and processes connected by the human world need to be examined in the ways in which human embodiment facilitates these connections (*Sense of Place* 21). Where at one time the idea of cosmopolitanism evoked notions of the well-traveled, well-versed individual, today the idea can potentially mean little, given the relative ease of travel and self-informing. "Cosmopolitan" risks becoming an empty vessel unless it substantiates some degree of engagement. It is now, more than ever, easier to engage with the many intricacies and nuances of a "global" world. As Ken Hillis states,

> [h]umans have always been in place but they seek to extend themselves as part of producing meaning, as well as for the novelty of attaining different

> "points of view". This is an ancient and ongoing process…. Contemporary electronically mediated communication, however, now increasingly substitutes for an actual physical going forth on our part. Communication technologies not only affect our experience of the world but also have concrete effects on our actions and places of the earth. (*Digital Sensations* xviii)

Adding Hillis' argument to the mix, the ability "to go out" and engage with the "cosmopolitan" becomes an embodied experience as information and communication technologies play an increasing role in our material access to a global world (*Sense of Place* 65). If "cosmopolitanism" is a pliable sense of embodiment that admits to a physical "rooting" but views place as planet, it requires an extension of human senses beyond the borders of one's "horizon" in order to break down local moorings tying one to limited views. This view makes the global the center and the local the periphery.

Cosmopolitanism forwards an embodiment that, as Mark Hansen posits, "is in 'continual interaction' with contemporaneous constructions of the body," but "also possesses a materiality and concreteness that distance it from those constructions and undermine their descriptive sway" (*Embodying Technesis* 47). Heise's cosmopolitanism fluctuates between what Hansen calls *epistemological* or *artifactual embodiment*—"the constitutive role of embodiment for the analysis of socially constructed knowledge"—and *phenomenological* or *corporeal embodiment*—"the necessary background out of which all acts of inscription emerge and take on meaning" (27). I will address these forms of embodiment in more detail later; but for now, let me state that cosmopolitanism *is* epistemological embodiment as a means of constructing knowledge from global perspectives—what Heise has referred to as "distance reading," relying on scholarship and criticism—*as well as* corporeal embodiment as the expectation to locate oneself as the irreducible point of planetary engagement—what Heise has described as "immersion versus tourism" ("Environmental Humanities"). Put another way, while one can embody knowledge from around the globe, one is inevitably located at the point of one's body

(as opposed to someone else's body or a "global" body) for engagement and meaning-making.[109]

4.3 A (Re)Mixed Reality

In early 2009, NASA attempted to launch the "Orbiting Carbon Observatory [OCO]," a satellite orbiting 438 miles above the poles ("NASA Mission" 2). The project was commissioned to improve the understanding of climate change by providing visual data of carbon concentrations and carbon "sinks"— deposits of an estimated 30% of carbon emissions from the industrial era. According to NASA, the OCO would detect the concentrations of carbon by use of reflected sunlight. The degree of saturation of carbon would be indicated by the amount of light the OCO detected. NASA then would input the data into computer models to "quantify the sources and sinks" ("NASA Mission" 2). The satellite would allow scientists to identify concentrations of emission where previously they could only assume they existed. Unfortunately, the satellite crashed into the ocean during launch, ending NASA's attempts to unlock an important component of the climate change puzzle, a puzzle that ultimately depends on the ability to "transfer" information from the material world into terms that humans recognize.

The key, as detailed in chapter 2, is the intelligibility of the material world reached in the course of a "translating" or "transferring process," what some scholars of new media refer to as a "coding." Media scholars have capitalized on the schema of coding, the process in which the nonhuman world is de-coded (revealed, disclosed, or made "visible"), en-coded (or translated into another code), and re-coded for human understanding in an attempt to get at "the things themselves," to use Bruno Latour's phrase covered in chapter 2 (*Pandora's Hope* 16). While some may argue that the result is an anthropomorphization of the nonhuman world (rainfall

[109] Interestingly, in his book *Electronic Monuments*, Gregory Ulmer advocates for tourism based on theoria. Ulmer contends that early theorists were tourists, but tourists that traveled to study the world and did so by immersing themselves in open and accepting sensory experiences. The type of tourism that Ulmer describes suggests an embodied experience of immersion yet one that understands that the tourist, no matter how engaged, is not a part of the culture, but will leave with valuable aspects of the culture he/she visited. In many ways, I see this as complementary to the type of embodied cosmpolitianism I am associating with Heise.

becomes a statistical average, for example[110]), others like Latour contend that the translation "compresses data" while "conserving some trait(s)" that distinguishes it (63).

The process of "coding," from a theoretical perspective, facilitates understandings of contextual materiality that would otherwise be obscure due to "unintelligible qualities," in perception or understanding, of the natural world.[111] The process does not guarantee that understanding will be reached (in fact, the process simply puts the object into another code or form); nevertheless, the process attempts to put the object into more common and/or recognizable terms.[112] For example, as an epigram, the website for NASA's OCO states that the OCO is "watching the earth breath…mapping CO2 from Space" (at the time, NASA had assumed that the launch would be a success):

Figure 4.1 image of NASA's Orbiting Carbon Observatory webpage and epigram.

This metaphor underscores the very real ways in which NASA would have coded the material, and unintelligible data into a visual re-presentation that is more familiar to most people. If NASA were able to "map" carbon dioxide through the OCO, then the "map" would have added more recognition or presence to an otherwise invisible gas. The mapping establishes a correlation

[110] Without the "human" component (numbers, in this example), rainfall would be measured by the abundance or lack of flora and fauna at any given moment or over time, which exist within an average; but as per the point, this average doesn't reveal the extent to which climate changes, only that it fluctuates. Moreover, coding and decoding suggest a structuralist approach: meaning is waiting to be discovered, when in reality, the process only shifts meaning to a more intelligible point but does not guarantee understanding or articulation.

[111] Special thanks to Kevin Porter and Bob Markley for their generous comments and help with grappling with the transference or coding process.

[112] Perhaps the most common example of this process in climate change is the conversion of "invisible" carbon dioxide into recognizable forms of CO_2 such as colored graphs. Worth noting, this process can also occur naturally as cool winter months make the carbon (and other) emissions from cars visible. Again, though, the trick is translating the objects into recognizable forms.

between life functions of the planet (that go unnoticed) and of people as users are reminded of the exchange of oxygen and carbon dioxide (and other gases) through "breathing." NASA's map provides a visual re-presentation of the normal exchange as well as areas with high concentration of carbon dioxide, where the exchange fails, that would otherwise go unnoticed. While the general knowledge of oxygen and carbon exchange is learned at an early age, the function of the website (and technology) translates users somewhat abstract lived experience into a variant mapping that provides more clarity to the process as well as a more "direct" link to material deposits of carbon emissions. The website offers information that, while seemingly obvious (that carbon exists), has the power to change common views about the world by mapping excess carbon, and what this potentially means.[113] A link to another NASA website further illustrates NASA's visual metaphor, yet literal technology: "Global Climate Change: NASA's eyes on the Earth" operates under a similar visualization re-presentative premise as the OCO would have. Users "fly along" with NASA to visualize real-time data gathered from NASA satellites and missions (a re-presentation of unintelligible data that becomes more familiar through coding), a blending of digital and material experience. The blending of experience is an augmentation of embodied connections to technology that is illustrated through the use of familiar designs and the invitation of participation.

[113] In *Our Own Devices*, Edward Tenner examines how technology affects and is affected by human development. He argues that technology has the power to shape views of the world, but that these views are in turn a result of the use of technology. Certainly less deterministic in his views on technology than Marshall McLuhan and Friedrich Kitler, Tenner argues even simple technologies like writing and shoes have had significant impact on bodies and cultures. The task of visually mapping carbon seems simple because "everyone" knows it exists. However, a simple modification that reaffirms what is known provides more clarity. Similarly, while many people had a general sense of how "bad" eating fast food was, not until technologies that revealed fat content, types of fat, calories, ingredients, preservatives, was more direct clarity provided of just how "bad" it really is. But herein lies Tenner's point, while these technologies change in thoughts about food, approaches to food changed the technologies—increasing or decreasing portion sizes for example.

Figure 4.2 Image of NASA's "Global Climate Change" webpage allows users to interact with real-time data.

NASA employs pictures of natural environments and a digital image of the circumnavigation of the planet by NASA satellites. The image suggests a blending of "natural" and "virtual" landscapes/datascapes, which culminates in the users immersion, an immersion that is only

possible through corporeal connections to physical and virtual realities. The connection is capitalized by the use of the term "eyes," a bodily function, and the invitation to "fly along," an inclusion in the process. Users participate not as authors but as actors in the reception and proliferation of data. Rhetorically speaking, NASA's website provides a level of audience participation not in the construction of the "text" or information there within, but in the writing of a new text, a new, more informed approach to carbon reduction, which ultimately plays out in the lives of the audience and not within the pages of the website.

The NASA example illustrates how the media by which we receive our information about climate change contribute to our understandings and actions.[114] Although currently more advanced, the use of technology, especially to produce identifiable images, is nothing new in environmental issues. Images have long been employed as a means of persuasion. The camera (and filming apparatuses in general) was valorized for its ability to "capture reality and remember nature," establishing a lasting memory for the eyes' fleeting experience (Dunaway, *Natural Visions* xvii, 30). Above all, there was a hope that the camera (and visual imagery) could capture the "reality of nature and bring [people] closer to the nonhuman world" (xvii). Through presentation, arrangement, and narration, images were used as a method of persuasion to forward pro-environmental messages. The ability to visualize environmental issues even when occurring hundreds, if not thousands, of miles away impacted the public and brought a wider audience to environmental concerns. Visualization has also played a critical (and at times negative) role in defining cultural conceptions of the environment.[115] NASA's OCO would have worked in a similar fashion as traditional uses of images, with two significant distinctions. First, because of the computer, the OCO would provide greater depth to its focus

[114] The NASA project was an attempt to code an unintelligible, but somewhat recognizable, aspect of climate change into a digital, and better understood form while maintaining the material properties of the sinks digitally; this is a strong example of digital materiality.
[115] One apt critique of photography, among others, is its inability to project future scenarios, which is crucial for addressing climate change. Photography has certain temporal limitations that anchor it to a present as it is reflected from the past (through comparison). See "Seeing the Climate" by Julie Doyle in *Ecosee* edited by Sidney I. Dobrin and Sean Morey.

by using multiple mediums including, graphs, models, and non-temporally bound data and projections. The temporal freedom, even if only understood as potential, would allow NASA to capture reality and *project* nature into the future of climate change, not only "remember" it as a past. Specifically, technologies like the OCO have, according to Lev Manovich, "enabled" a "genuinely new cultural form" of engagement called "dynamic data visualization" ("The Anti-Sublime" 1). Data visualization and the compression of temporal constraints help to erase what Andrew Szasz describes as a break between abstract and experienced phenomenon. In Szasz' words, "[t]he gap between predictions of future catastrophe and people's actual experience—that things are evidently not falling apart now—[that] is simply too great" at the moment (221). Technologies that provide a visual and more familiar representation of abstract, almost ethereal happenings bridge the gap between what people experience first hand and what the "data" suggests that they are experiencing in spite of an inability to concretely register the experience. Data that suggests that the planet is continually warming works to assuage doubts of a changing climate during harsh, record-setting winters or flood-producing spring months. Had the OCO succeeded, for example, it would provide past and present carbon analysis but also project the future, giving more connection to material experience (even if only registered as a potential future).

4.4 Media and Material Messages

Whether or not one agrees with Marshall McLuhan's famous (and well-worn) assertion that the "medium is the message," media do, in fact, surreptitiously influence how we interpret the message. The United States of America, and most Westernized cultures are cultures of instant, visual, information. In many ways, climate change, or at least its materialization as a "here-and-now" and an "already-happening-in-the-future phenomenon," takes place on the interface, the convergence of humans and technological apparatuses, most specifically the monitors of computers, hand-held devices, and televisions. While we choose to acknowledge (or not) the effects of climate change in the "natural" world, digital media greatly influence how (and why)

we inscribe the effects in the world. Most meaning-making occurs through and with the visual interpretation of scientific data or cultural norms, in spite of our material interactions with the everyday happenings of climate change. In fact the perception of climate change is much like the perception of weather. As Marita Sturken's claims, weather is "no longer something one goes outside to register, that one experiences on the ground and in the flesh. It has become, rather, a technological experience, seen from satellites and endlessly monitored on television and the Internet" ("Desiring the Weather" 161). The Intergovernmental Panel on Climate Change, perhaps the most widely referenced source on the matter, makes a distinction about "climate change," in its AR4 report, that all but requires visual-technological apparatuses in order to categorize the phenomenon. The IPCC recognizes climate change as "a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer" ("Annex 1," Glossary 812). Put another way, statistical tests, the identifying factor, need be shown, over a trajectory that, by some manner, must be represented. To understand climate change, one must make some connection with data representations of the phenomenon. One cannot have as clear an understanding simply with a direct contact or a "first person embodiment," as Don Ihde, Bob Markley, and others have expressed. There must be, in order to understand the implications and history of climate change, a mediation[116] (here digital technology) that provides a broader swath of time, culture, evolution, and planetary development, including the social, political, and cultural.[117]

[116] Other media can be used, of course. Bob Markley, for example, examines 17th and 18th century texts as a way to trace the trajectory of climate change. Similarly, Richard Kerridge examines poetry as a means of engaging with representations of global warming (taken from Kerridge's 2009 ASLE Conference panel presentation, "Global Warming and Literary Form").
[117] Robert Markley describes "climatalogical time" as an approach to climate change that includes a long history (500 – 100,000 years), first-person embodied experience, the mediation of science and culture, and the assessment of literary accounts of climate. Stewart Brand has a similar method of assessment termed *the long now* that uses long and deep time as well as the slow pace of nature and culture to orientate human endeavors on the planet. The goal for both

4.5 Climate Change The Floating Signifier

Worth noting, too, are the potential problems of visual and technological dependency. Critics of visualism argue that too strict a dependency on visual apparatuses risks a one-sided "object/subject" dichotomy. Addressing a stringent dependency on technological or culturally created information (which includes visualism and visual apparatuses), Albert Borgmann claims that humans are often left in a state of sensory depravation in regards to natural information, that which is found directly in the world. He states, "whatever is touched by information technology is detached from its foundation and retains an unsubstantial bond from its original […] the object is 'virtual,' floating with a nostalgia for whence it came" (5). Because mediated climate change focus on "removed" versions of the natural world (atmospheric data versus the atmosphere itself, for example), the natural world may become impoverished or secondary; at the very least, there appears to be no direct connection. Natural information resides in the here-and-now while technological information extends virtually across multiple axes. Moreover, the visualism of science and technology may champion the observational approach to climate change thereby weakening or misdirecting the lived experience. That is, visual, technological data may supersede lived data. As Lev Manovich contests about mapping data and visual art projects, "[b]y allowing us to map anything into anything else, to construct infinite number of different interfaces to a media object, to follow infinite trajectories through the object, and so on, computer media simultaneously makes all these choices appear arbitrary" ("The Anti-Sublime Ideal in Data Art"). In other words, too much information and too many possibilities can impoverish (or limit) material concerns. Consider a familiar image of sea level rise:

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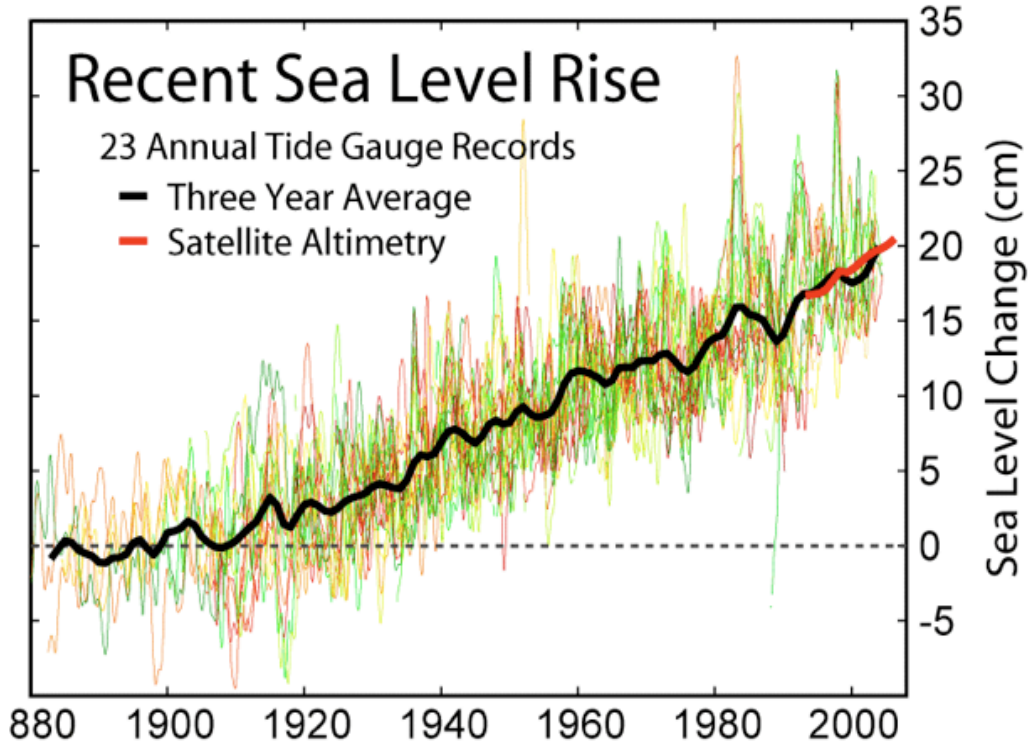
of these scholars is a broader assessment of what it means to understand natural and cultural changes in the "lifetime" of natural and human history and development.



Firgure 4.3 Image of sea level rise over the last century. Robert A. Rohde / Global Warming Art.

Upon viewing, one understands that the sea is rising. However, The viewer is left with nothing from which to gauge his/her material experience, unless he/she is intimately familiar with how numbers translate to terrestrial markings. The image, although useful, is all but devoid of a material connection other than the assumption that the viewer makes that the graph is in fact reflective of the planet's oceans. Without the assumption, viewers are left with a gap between the perception of the visual representations and what they witness when they walk outside, that is, between abstract and experiential data.

From a theoretical and philosophical point of view, one could argue that global climate change occurs as a re-presentative form on the screen. Humans simply do not have the longevity of direct embodied experience to really gauge the severity of global climate change as is suggested. Returning to Andrew Szasz's point, the gap between the lived, embodied experience and the visual data on monitors is too significant. Climate change is also a

technological phenomenon. Yes, it exists materially; but for many, it exists as a visualized prognostication of a past, present, and future, which thinly matches the embodied experience. Technology facilitates a paradox between first-person experience and third-person understanding, an uncomfortable position from which to engage. Embodied experience, which may extend half a century or better, simply is not enough to gauge climate change without technological support. Nor, in spite of a degree of longevity, can it systematically account for the fluctuations that *normally* occur in climate (El Niño, for example). Although one could argue that the intrusion of technology into the nonhuman world colonizes and fundamentally alters our perceptions of the natural world--more specifically, makes it an "artifact" of humans--ultimately for climate change (and other environmental issues such as toxic waste and chemical spills) a technological component is necessary. The critique should not go unchecked. If global climate change is an artifact of humanity, the problem will have less material significance within the natural world. A major concern about technological dependency is the degree to which technology becomes, as Steven Shaviro argues, a background for our world and from which we gain meaning (64). If technology becomes primary, to the risk of "surrogates," in which digitization supersedes the material, becomes probable. The shift in equality echoes Baudrillard's "simulacra" and Debord's "society of the spectacle" in which copies detach from the material world and engage in an exchange of social capital, and not necessarily material capital (such as the examples of the Diesel jeans campaign given in the introduction and chapter 3). Obviously, for global climate change this is detrimental because it completely undermines the very real, very material a/effects. Global warming becomes a problem for the monitor, not for the material world.

Although the above critique is useful in marking the extreme poles of the climate situation (as well as providing a cautionary tale), technology is also defined by how it is used. Bolter and Grusin address this by "propos[ing] to treat social forces and technical forms as two aspects of the same phenomenon: to explore digital technologies themselves as hybrids of

technical, material, social, and economic factors" (77). To engage with the digital necessarily means addressing the material implications, not only in the digital objects themselves, but how they are used in the process of meaning-making and the material consequences of the objects and process. The use of technology to refer to the disclosure of an object constitutes part of (certainly attached to) the process. The use is an action, a performance, and ultimately contributes to the material meanings and consequences. Digital technologies are "actants" (Latour's term for nonhumans involved in the process of discovery), imbedded in the process and recognized for what/how they perform. A digital image of the receding polar icecap re-presents (as performance or "articulation" to use Donna Haraway's term) the loss of ice that one may or may not experience if he/she visited the poles. The image does not guarantee understanding, meaning, or anything for that matter. Only when the image is taken as a realistic image and not a "semiotization, a useful description" (Lévy, *Cyberculture* 53) are the problems more severe.

Returning to the pitfalls of Baudrillard's and Debord's theories, only when addressing "copies" as original or detached and not a part of the process do the theories cause problems. For Baudrillard, the simulacra is a copy that has no original; the copy becomes the original. With digital approaches to climate change, the re-presentation *augments the original* and will be a variant of the original as it provides intelligibility. Digital approaches are a means of what Slavoj Žižek describes as "looking awry," "a means of rendering visible," in which the real is observed and interjected into reality. Žižek claims that looking straight at an object fragments the view, but by looking awry, the real object stands out (*Looking Awry*). By "looking awry" at the material world, digital re-presentations of climate change reveal a materiality, which is not a copy, but an actualized variant that complements the material that is not otherwise intelligible. Digital re-presentations remediate and extend our personal embodied relationships with the material world. As Bolter and Grusin claim:

> Although Baudrillard's notion of simulation and simulacra might suggest otherwise, all mediations are themselves real. They are real as artifacts (but not as autonomous agents) in our mediated culture. Despite the fact that all media depend on other media in cycles of remediation, our culture still needs to acknowledge that all media remediate the real. Just as there is no getting rid of mediation, there is no getting rid of the real. (55-56)

Debord's example of the society of the spectacle is no different. For him copies represent social interactions based on perception of representations. He argues that humanity no longer interacts directly with its surroundings nor does humanity interact directly with the representations of its surrounds but rather with perceptions of representations. Unlike social interactions based on commerce, societal norms, and economic exchange, the visual perceptions of global climate change provide a degree of legitimacy to the phenomenon because they make the unintelligible intelligible. If social life has been replaced with representation, it is because of rampant capitalism and economic exchange. If visual presentation has come to stand for global climate change and material experience, it is because the phenomenon is hardly accessible otherwise. In fact, with climate change, visualism presents a common, material bond between all social structures, the potential destruction of the planet. As a global phenomenon, climate change has no social ties (unlike branded products in Debord's example). Although on the surface it appears to affect social classes differently, whether by "boomerang effect," "latent side effects," (Beck, *Risk Society*) or planetary meltdown, no social status is left protected. Moreover, as the spectacle seeks to impart bourgeois ideals onto a society that thinks it wants them, the technological aspect of climate change is not reflected equally, as brands are, in the eyes of the consumer. Put another way, both Baudrillard and Debord rely on a negative form of "branding" in which the brand is the focus and the vessel for many significations, not the material consequences, which are at the forefront in climate change. An image of NIKE basketball shoes essentially holds the same

brand, and thus capital, across the globe; they are a symbol of athleticism, taste, money, and a degree of power. The presentation of global climate change, though dependent on similar mediums, "brands" the image as a connection to the material world and/or a redistribution of it on a global scale. When understood as an embodied relation and not a "conscious" representation, the role of technological mediation within the human and nonhuman world can have positive implications. [118] [119] For example, Richard Grusin, in his examination of National Parks as technologies, suggests that a goal of media technologies is to provide an "authentic" experience of "unmediated nature from anywhere in the world" (*Culture, Technology* 162 – 63). Grusin is quick to point out valid critiques, but the positive is the access to remote (variant) natures without physically being there—cosmopolitism at its best. Although this may impoverish a first-hand embodied experience of location (touching the ground, for instance), it necessarily supports the forms of technological embodiment that are required in addressing global climate change.

In contrast to the graph depicting rising sea level, the following image has a more concrete re-presentation of size, shape, and scale. Where the graph had perhaps too much information and possibility, as Manovich suggests, this image is framed clearly enough to provide the viewer with a digital bridge between what is and what could be:

[118] Think of wearing glasses. The material object does not change when one takes off the glasses; rather, it becomes less intelligible/distinguishable. When one has glasses on, the object is clarified, it is not a copy, but the original and the relation between it and the observer is improved by the technology of the glasses. The relation, then, is an embodied one as the user has an apparatus that connects him to the material world, but he does not see a lesser materiality, or a copy.

[119] For more on "branding" and its role in the political, cultural, economical, and environmental issues of global communities, see Naomi Klein's book *No Logo* in which she examines the connections and trajectories of global production and consumption of the world's most recognizable (and profitable) brands (NIKE, McDonalds,). Klein attempts to guide the mostly Western reader through the deplorable conditions under which many brands are produced. She argues that once the audience realizes the woeful situation of global capitalism, especially for brand name products, the audience will protest against global companies, resulting in a large-scale movement.

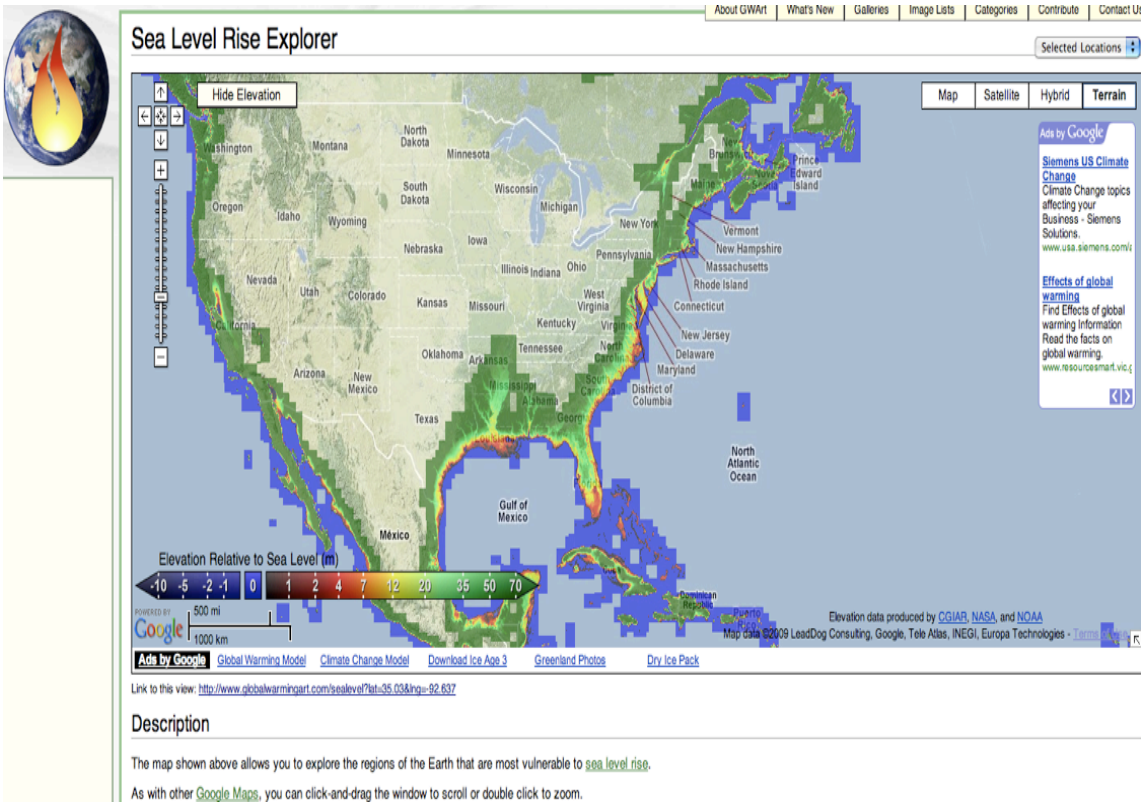


Figure 4.4 Image of seal level rise on a map of the USA. Robert A. Rohde / Global Warming Art.

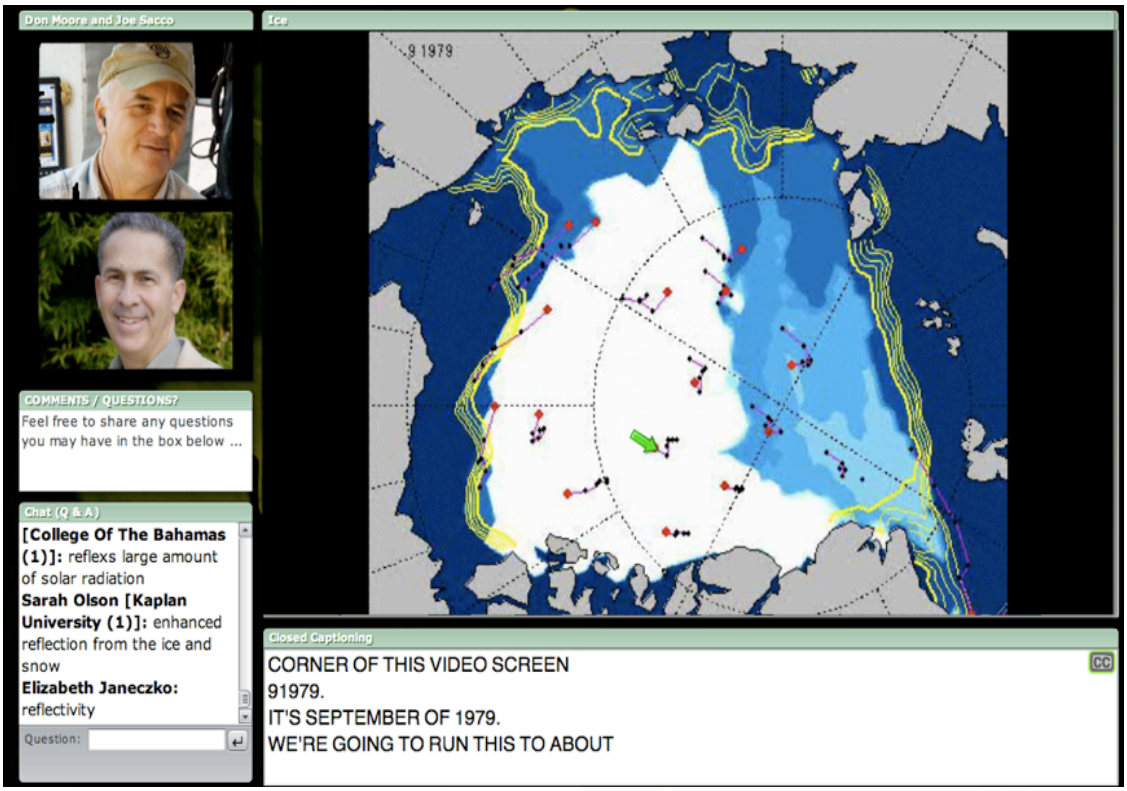
The "Sea Level Rise Explorer" connects the viewers' material experiences of terrestrial coastline to their (re)mediated experience of the (potentially) real changes. As a digital tool, the "Sea Level Rise Explorer" fashions data in a more familiar and applicable manner than the aforementioned graph. Even from North Dakota, far away from the rising water, one is more familiar with the implications because of the context (a material connection based on experience) and the visible geography (if only through maps). The "Sea Level Rise Explorer" utilizes data in a way that alludes to cultural and social implication (what happens to the people on the East Coast, for example?). The viewer has a digital-material image through which to acquaint lived experiences with climate change. As Lester Faigley et. al state in *Picturing Texts*, "[c]ollectively and individually, we accumulate a visual vocabulary much as we build a vocabulary of words. This visual vocabulary contributes to our view of the world—and it affects *how we see* and understand the world. […] To a large extent, then, we construct our realities as

we learn to see, filtering information through our experience and memory" (324-325). Our experience and use of information affect our approach to the world. Establishing a vocabulary based on digital re-presentations fills abstract or unintelligible gaps in experience and views of the world thereby contributing to a better and more material understanding of climate change and the material implications and consequences for human and nonhuman alike.

Another example of a digital connection is an online "teach-in." The "Smithsonian Education Online Conference on Climate Change" occurred over three days in September 2009. The conference exemplified the use of visualism and embodied, digital experience. It blended science and culture, while addressing the materiality of climate change through digital media. Moreover, the online conference utilized the ad-hoc, dispersed collective activism of a networked public sphere. As a location, the sphere is cyberspace; as a movement, the sphere is located in the many locales of the participants. In other words, the Smithsonian event occurs in a broadened understanding of "space," which Mark Nunes describes as "emergent, dynamic events brought about by a confluence of conceptual structure, material form and lived practice (*Cyberspace* 25). When viewing one of the many sessions, users get the sense of a fragmented terrestrial location but a unified location of the web as the collective space from which the sessions operate. The Smithsonian event, and others like it, promote a hybrid activism with involvement both online and off with both loci of participation informing and furthering the other. Although dispersed across the globe (and time), through the interface the virtual/physical presence of the broadcast unifies the project and makes the sessions familiar and accessible—the viewer can see everything relevant to a particular session within a glance. There are no links, no pop-ups, no other interferences that would obstruct participation.

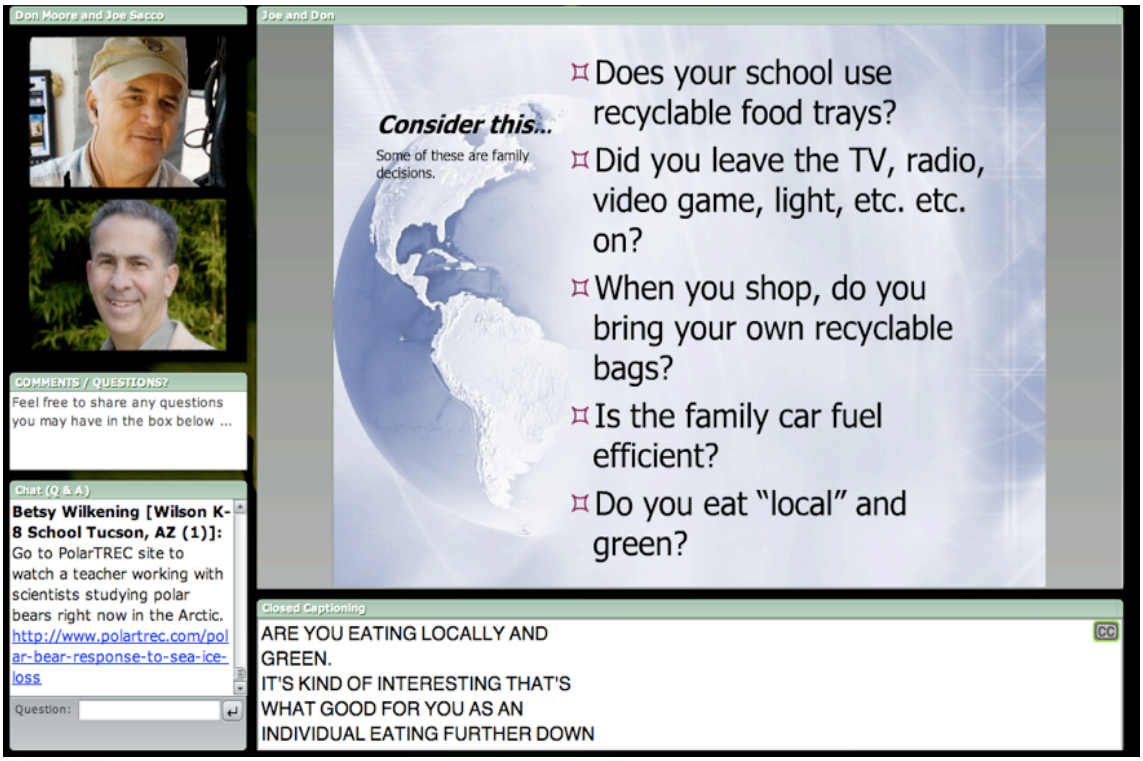
Visualism and digital materiality echoed throughout the conference as sessions utilized digital applications to demonstrate the affects and effects of climate change. In the image below, Don Moore and Joe Sacco, provided a digital video of computer animation, illustrating the recession of ice around the North Pole over the last three decades and how the loss

affected polar bear habitat. While not the “actual” habitat, the digital video provided a connection between participant and the poles thousands of miles away. Participants, few who will probably travel to the North Pole, are aware of the material consequences of climate change via a digital link that does not attempt to copy, but rather provide a variant and a material connection:



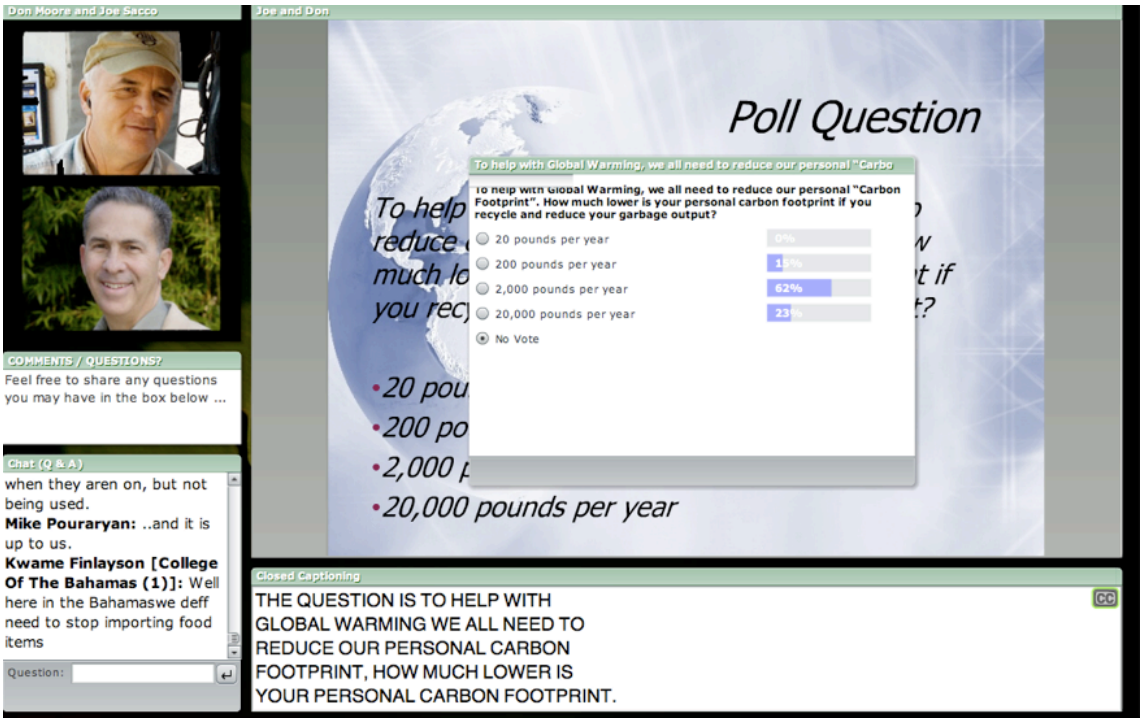
4.5 Image showing the recession of ice at the North Pole.

Moreover, the session attempted to connect local impacts with broader global implications. This approach ensures that, even while the focus was on polar bear habitat and receding ice, participants were grounded in local actions that have global results, further bridging the gap between abstract and experienced consequences. The session focus signaled that participants affect distant areas and that acting locally probably has more impact than traveling to the North Pole. Distance is irrelevant, but familiarity through digital means is key.



4.6 Image of questionnaire for participants.

The Smithsonian session garnered participation through write-in questions, polls and an ongoing dialogue about the responses and answers:



4.7 Image of real-time answers and dialogue during the session.

The brief example of the Smithsonian event and digital images of rising sea level complicate critiques of digital applications as obfuscating the material. Rather, digital technologies emphasize the technological, embodied, and visual tendencies of current approaches to global climate change and the process through which meaning is ultimately produced. I will now flesh out each of these, the technological, embodied, and visual tendencies before returning to further examples that codify the role of human technological relations in addressing and acting against climate change.

4.6 Techno Science and Digital Materiality: An Authentic Variant?

Technologies as a part of the creation of global warming with dissolving boundaries between the human, technological, and natural comes as a recasting of materiality. What I term digital materiality originates from theories of materiality that address the intra-actions between the human and nonhuman worlds. Theories of materiality do not privilege language or discourse; rather, they acknowledge their roles in disclosing the nonhuman world. Digital materiality begins

from the same premise. Whereas the hype surrounding digital technologies, especially cyberspace, furthers the gap between mind/body, nature/culture, abstract/experiential, digital materiality suggests that digital and visual considerations provide better, more material connection to the world. Visual images and digital productions are not privileged over the material world but are understood as intra-acting with them as a performance of articulations. Robert Markley argues that cyberspace can never be separated from the very politics it seeks to transcend. Moreover, in spite of the illusion that cyberspace can transcend limited resources, world problems, and so on, it is always tied to the materiality it seeks to usurp (*Virtual Realities,* Introduction 4). The information developed through visual and digital means is not a virtual representation, but a re-presentation and a variant of a material connection. In addition to typifying what theorists such as Pierre Lévy and Mark Hansen describe as "mixed" and "augmented" realities, the lens of media ecologies works well to document and reveal the "mangle," to use Andrew Pickering's apt term, of materiality articulated from human and nonhuman agents.[120],[121] Climate change is clearly connected to and affected by the technology used to identify it; the media used to address it; the language used to describe it; and the people—including their cultural, social, and ethical considerations—bound to it. Relations to climate change are as much about mediated approaches (if not more) as direct physical contact or observation. Examining and questioning the intra-actions of as many of the material agencies involved as possible best addresses these relations. Media ecologies reveal the connections, not isolations, of all the phenomena implicated in the broader considerations of global warming

[120] Media ecologies refer to the networked systems and connections involved in the media process. For example, the user(s), the computer, the hardware (materials), the software, the applications, and so on, constitute the media ecology of a computer system. See the Media Ecology Association.

[121] Pickering, in *The Mangle of Practice: Time, Agency, and Science*, forwards that science, theory, fact, practice, machines, humans, nonhumans, to name a few, are always involved in an ever-changing and unpredictable relationship. In my mention of it here, *mangle* is applied with a similar premise with the inclusion of digital technologies. Pickering's term complements media ecologies, which also address the complicated inclusions of media and networked systems. Neither the mangle nor media ecologies escape the political, cultural, social, and other arenas in which they operate.

and exemplify (and make intelligible) the natural, cultural, and technological information that, according to Albert Borgmann, articulate understandings of reality (*Holding onto Reality*). Material climate change *is* a mangle of nature, culture, and technology (and more), but technology enables access to portions of materiality that would otherwise be missed. Pierre Lévy argues that technology "provides access to certain possibilities, that certain cultural or social options couldn't seriously be contemplated without its presence." (*Cyberculture* 7). Echoing Latour's theory of the circulating reference, Don Ihde contends that technology reveals, "that which is below the surface […] and more complex phenomena emerge" ("Whole Earth"). Of course, as technology "reveals," the problem, as Ihde explains, becomes one of hermeneutics, a "matter of right reading" and "general human comprehension" ("Science Critics," "Hermeneutics"). The material relations and technological extension influence the observers' readings and understandings of and interactions with the world.

How we "read" is directly tied to the ways in which we observe techno-mediated information. Ihde's use of the term "visualism" refers to the cultural dependence of displaying information in visual form.[122] According to him, visualism removes the here-body experience in favor of a third-person experience. This approach to climate change (information and experience) transpires through third-person observation practices mediated by and through technology. Nevertheless, argues Ihde, the observer is connected to the experience by the technology he or she employs in the research. The technological apparatus is a part of the material process. Pushing a bit further, visual approaches should produce "effects of connection," to quote Haraway, as well as "embodiment" and "responsibility" ("The Promise of Monsters" 64). Connection to the material environment runs through the tools of meaning

[122] Lev Manovich uses the term *visualization* to refer to all visual data and situations involving it that are otherwise not visible. He states, "I will use the term visualization for the situations when quantified data which by itself is not visual – the output of meteorological sensors, stock market behaviors, the set of addresses describing the trajectory of a message through a computer network, and so on – is transformed into a visual representation ("The Anti-Sublime Ideal in Data Art").

making and orientation (language, signs, technology), directly linking participants. Moreover, posits Lévy, "we cannot separate the material world—even less so its artificial component—from the ideas through which technological objects are conceived and used, or from the humans who invent and produce and use them" (*Cyberculture* 4). Put a different way, the study of climate change depends on an "instrumental realism," which links the material world and the visual data through the embodied connection between the object of study and the observer. Ihde states, "of course science requires measurement, quantification, and the process of analysis which occur in mathematization—but it equally requires a material relation with the 'things themselves' and this occurs in actually embodied science. That embodiment is the technological extension of primary perception through instrumentation" ("Whole Earth"). [123]

Returning to cosmopolitanism as a form of embodiment, Mark B. Hansen contends that corporeal embodiment "links embodiment directly to the (human) process of *living through the body*" and is "the necessary background out which all acts of inscription emerge and take on meaning" (*Embodying Technesis* 27). In a global, real-time society, technologies force humans to experience corporeality at and away from the body. With climate change, for example, technologies that provide a modicum of intelligibility to abstract factors enable persons to experience climate change directly at the body (in ambient temperature) and away from the body (perceptions or knowledge of the material consequences at other locale). Nevertheless, the ultimate focal point is the body, as actions, emotions, and thought are projected "at home," but with an acceptance to how the globe is affected. Thus, cosmopolitanism is a projected form of corporeal embodiment, taking information of global issues and applying it locally, with global implications. The information from distanced places is taken as legitimate in the process of experiential and corporeal access. To experience the receding ice caps online is an experience; it is a variant re-presentation of physically "being there." Corporeal access to the nonhuman

[123] In his study of the visual space, McLuhan makes a similar claim "to the scientist using visual assumptions about phenomena, nature appears as a collection of figures whose variety and discontinuity can be eliminated by means of abstraction" (*Laws of Media* 23).

world is furthered through the digital materiality that mediates the world and provides information as corporeal connections when the physical body is not out in the world. Information, as Borgmann claims, underlines perceptions of reality and is, according to Mark Poster, a commodity essential to human interaction (*Information Subject*, *The Mode of Information*). Poster argues that the "ideal man" is one who is a well-informed, middle-class individual with access to and a means of producing information, oddly "cosmopolitan." The mobility and means of access to information drastically alter traditional concepts of reality and place. Online and offline activities bleed into and out of one another; argues Poster, "virtual reality" contains seeds of reality and plants seeds into reality (*Mode of Information*). Hansen explains, "because of the work performed by the body schema, human beings experience the virtual as a kind of 'fringe' of the actual they 'live' the potentiality of their embodiment outside the empirical space of simple actuality" (Hansen, *Bodies in Code* 43).

Steven Shaviro takes the experience a step further, arguing that individuals are never completely "out" of the digital network crossing the globe. For Shaviro, "the insidious thing about electronic networks is that they are always there, whether one pays attention to them or not" (5 *Connected*). In an age of always being connected, corporeal embodiment becomes less about the here and now and more about where the network takes us. Nonetheless, the body (in all of its locations) constitutes "an ultimate background, and absolute here, in relation to which all perceptual experience must be oriented" (Hansen, *Bodies in Code* 5).

In accessing climate change on a day-to-day basis, the experience is, according to Ihde, technological (third-person) and physical (first-person) (*Bodies in Technology*). No longer is the physical "touch" of climate change necessary in order to recognize, accept, and predict its effects; rather, experiencing a more temporal and spatial climate change requires the technological connection that "extends the body's ability to construct space and a world" (Hansen, *Bodies in Code* 26). In order to understand climate change today—even as a direct experience—it is necessary to connect with the past (core samples that "record" the increasing

amount of carbon in the atmosphere) and the future (what will potentially happen to the oceans) through media that are not routinely consider physical or first person. As Mckenzie Wark argues, participants become a part of the "virtual geography," an augmented telesthesia ("perception at a distance"), "a different kind of perception, of things not bounded by rules of proximity, of 'being there.' […] It is about the expanded terrain from which experience may be instantly drawn" (*Virtual Geography* vii).

4.7 Digital Materiality, Articulation, and Media Ecologies

In a lecture given at the University of South Florida in Tampa, Marshall McLuhan explained "the medium is the message." Claimed McLuhan, "[the medium is the message] really means a hidden environment of services created by an innovation, and the hidden environment of services is the thing that changes people. It is the environment that changes people, not the technology" (*Understanding Me* 242). Not the technology, but the *services* that go along with the technology change people. McLuhan uses the example of a car, stating that it is not the technology of the car that is most important, but the services of the road, the increase in transport, the compressed distance, as well as the factories that produce the car, the oil companies (and other resources needed to make the car more efficient). The connections (or consequences) of the technology are more significant than the technology itself, which Mark Hansen describes as the "after-the-fact" effects of technology once they have entered into existence (*Embodying Technesis* 43). In so many words, both McLuhan and Hansen take interest in the consequences of technologies within their processes of existence and connections between users and objects and within the systems of their use (Tenner *Devices* xi).

Jay David Bolter and Richard Grusin further argue that media function as objects within the world—within systems of linguistic, cultural, social, and economic exchange. Media are hybrids, "[m]ediation is a remediation of reality because media themselves are real and because the experience of media is the subject of remediation" (59). What has traditionally been known in the scholarly world as *media ecologies* explores the systems of use and the extension of

media texts and applications into our lived experiences. Media ecologies examine the potential connections and consequences for more equitable (and less static) uses of languages, images, and materiality through dynamic applications of users' local knowledge and expertise to global conversations. This diffuse and more inclusive approach is a means of exploring the materiality of the human (and their technologies) and nonhuman worlds by re-casting the responsibilities of language and technology that are often neglected when focuses are aimed at the technologies and not the connections or consequences.

Describing the relations between media and its connections, "the term 'ecology,'" according to Matthew Fuller, "indicate[s] the massive and dynamic interrelation of processes and objects, beings and things, [and] patterns and matter" (2). Media ecologies also refer to the network systems of the datascape that are connected to the material world; and, drawing upon James J. Gibson and Gilles Deleuze, the "material qualities of things-in-arrangement, rather than of their essence," which "allows objects to be understood in terms of their *potential or active relations* […] separate from the object itself" (45). Material consequences are not located at a technological device, but rather, within articulations of use and performance. Nevertheless, the technological device is a part of the "arrangement," melding an informed self and a corporeal body (Munster, *Materializing* 116).[124] The process and performance is not one of theory but "lived out in the embodied experience of users, who, enact, through dispositional practices, the forms and structures of everyday life" (Nunes, *Cyberspaces of Everyday Life* 177).

Participation through media such as the internet establishes an "informed intelligence" by contributing individually and collectively to communities and knowledge spaces (Lévy,

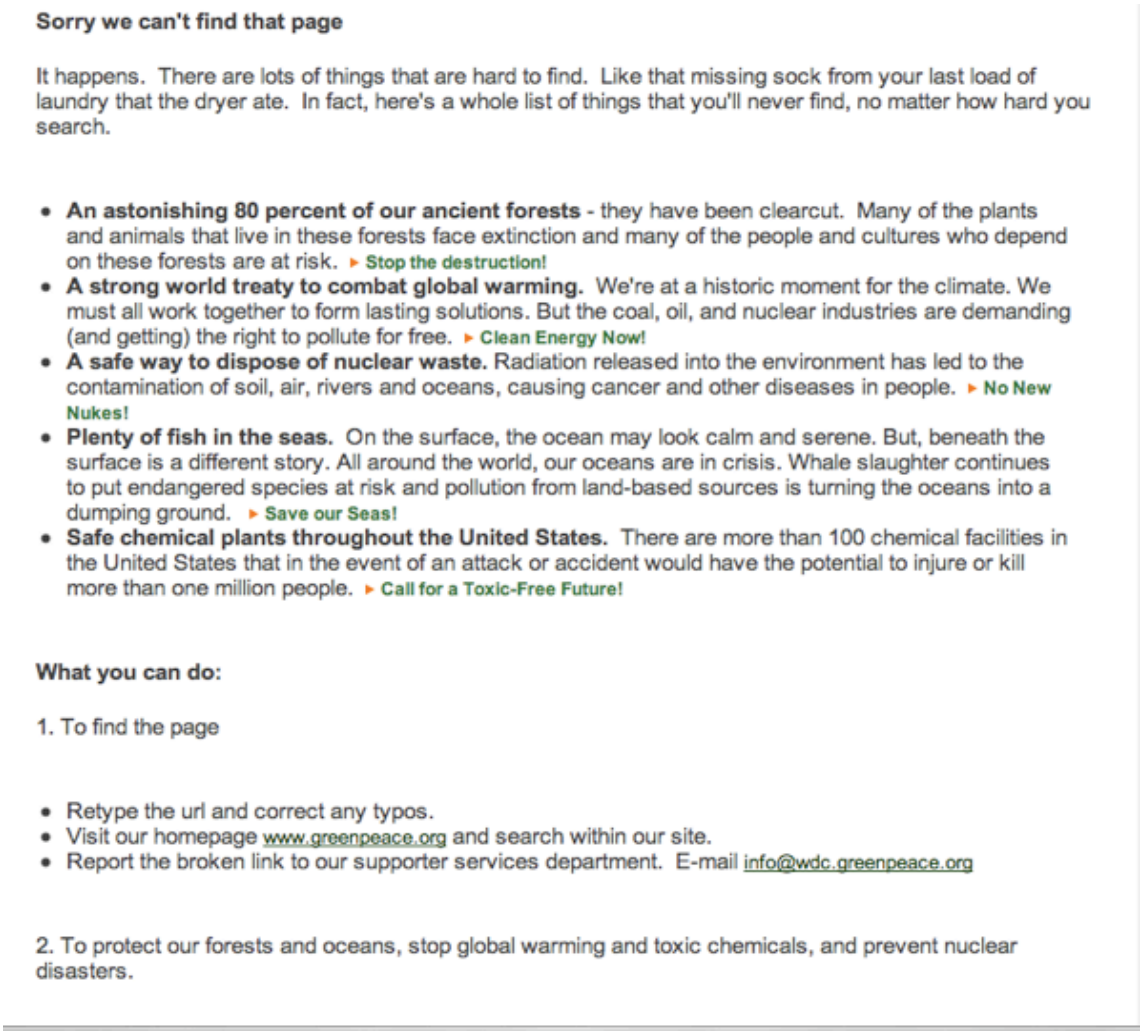
[124] Pierre Lévy makes an interesting argument about biological and cultural development in which the Web is a part of the evolutionary process. He gives three propositions in the developmental process: 1) there is a cultural evolution; 2) the cultural evolution is the continuation of the biological evolution; and 3) the unfolding of cyberspace is the latest step of the cultural / biological evolution and the basis for future evolution ("Meta Evolution").

Collective 16-17). As Clay Shirky suggests, the internet, and many other communication devices, has the potential for anyone to become a media outlet and participant. Although Shirky points out that contributions are limited to a few, participation resembles a more grass-roots approach without the need for professionals, traditional experts, or other one-sided knowledge sources (*Here Comes Everybody* 83 – 84). The online communal space that Lévy and Shirky describe is reminiscent of what Jurgen Habermas, Gerard Hauser, and others have argued as a public sphere, a common space in which participants engage in discourse about issue of concern.[125] Although debates rage about the specifics and usefulness of public spheres, the benefit is the collective space from which issues are engaged and the potential for collective action forms. Charles Taylor argues that the public sphere emerges in "topical" (specific, local assembly) and "metatopical" (non-assembly, ongoing and multiple) spaces, signifying a global and local arena of action. Through the World Wide Web, the public sphere addressing climate change is metatopical in assessment and topical in action, specifically because of the connections encouraged through global networks. The success and strength of campaigns utilizing the Web comes from the ability to provide a global approach through local accounts and experience. These "translocal" approaches, according to Giovanna Di Chiro, "address global environmental change by developing webs of local organizations and alliances among groups" ("Local Actions, Global Visions" 207) that extend across the globe through the network of the World Wide Web.

[125] See Habermas' *The Structural Transformation of the Public Sphere* and Gerard Hauser's *Vernacular Voices: The Rhetoric of Publics and Public Spheres*. Although Habermas' work is considered the foundation for scholarship on the public sphere, Hauser's work proves more useful because it more accurately describes how the spheres are active, porous, and contextually discursive. Hauser's treatment better fits the ways in which global networks and systems are becoming the prototypical spheres in which discourse and action emerge through a "plurality of publics" and a "reticulate public sphere" (11).

4.8 Activism

Activism comes in all forms, and the internet provides many ways in which people from the staunch activist to the couch potato can become involved. For example, Greenpeace puts a twist on the common “file not found” page that appears when a website is no longer available. The activist group gives a long and detailed list of objects that are not “found” such as Old-growth forests, GMOs on food labels, and the United States’ signature on the Kyoto Protocal (http://gpeace.convio.net).



Sorry we can't find that page

It happens. There are lots of things that are hard to find. Like that missing sock from your last load of laundry that the dryer ate. In fact, here's a whole list of things that you'll never find, no matter how hard you search.

- **An astonishing 80 percent of our ancient forests** - they have been clearcut. Many of the plants and animals that live in these forests face extinction and many of the people and cultures who depend on these forests are at risk. ▸ **Stop the destruction!**
- **A strong world treaty to combat global warming.** We're at a historic moment for the climate. We must all work together to form lasting solutions. But the coal, oil, and nuclear industries are demanding (and getting) the right to pollute for free. ▸ **Clean Energy Now!**
- **A safe way to dispose of nuclear waste.** Radiation released into the environment has led to the contamination of soil, air, rivers and oceans, causing cancer and other diseases in people. ▸ **No New Nukes!**
- **Plenty of fish in the seas.** On the surface, the ocean may look calm and serene. But, beneath the surface is a different story. All around the world, our oceans are in crisis. Whale slaughter continues to put endangered species at risk and pollution from land-based sources is turning the oceans into a dumping ground. ▸ **Save our Seas!**
- **Safe chemical plants throughout the United States.** There are more than 100 chemical facilities in the United States that in the event of an attack or accident would have the potential to injure or kill more than one million people. ▸ **Call for a Toxic-Free Future!**

What you can do:

1. To find the page

- Retype the url and correct any typos.
- Visit our homepage www.greenpeace.org and search within our site.
- Report the broken link to our supporter services department. E-mail info@wdc.greenpeace.org

2. To protect our forests and oceans, stop global warming and toxic chemicals, and prevent nuclear disasters.

4.8 Image of Greenpeace’s “File not Found” web page.

Greenpeace's declaration, "Sorry we can't find the page," attempts to disrupt the normalcy of losing something and then moving on, of misplacement and replacement that is so common in consumer culture and on the World Wide Web. Debord calls this act a "detournment" which disrupts by using spectacular images and/or language to disorder the flow of the spectacle. In other words, this approach uses the spectacle to disrupt itself by (using while) subverting the language and structure of a normed society of consumption and loss. The file cannot be found, and the user must, therefore, move on by forgetting or replacing. Greenpeace provides ways in which the "file," be it old-growth forest or safe disposal of nuclear waste, can be reclaimed or "saved," to use an apt pun, through its ongoing activism and information about the objects and avenues for user action. Greenpeace's protest informs users and provides potential points of resistance against environmental loss and degradation. Perhaps more to the side of information than activism (which in itself can be argued), the "file not found" nevertheless provides a jolt of awareness that traditional "file not found" pages do.

In a similar vein, the Environmental Defense Fund presents educational maps and information about "ambassador species" in the United States. These species act as the "canary-in-the-mine" for the country and northern portion of the continent. As an educational tool, the web page informs users about the species and links them to avenues of involvement:

4.9 Image of the Environmental Defense Fund's global warming and ambassador species page.

As an avenue of activism, the site provides ways in which users can further participate by sending e-cards, donating, taking action, joining social media outlets, and posting personal "Warming and Wildlife Stories," further personalizing the connections between climate change and users (http://www.edf.org/page.cfm?tagID=42590). The website illustrates the potential link between personal narrative and advocacy, that is, the role of "storytelling" in addressing climate change. As Michael Ziser and Julie Sze suggest, a more productive means of addressing climate change from the cultural perspective is the combination of "individual biography with environmental history in order to provide concrete examples of environmental damage that can become the basis for redress and reform" ("Climate Change" 404).

The websites from Greenpeace and Environmental Defense fund are intended as familiar pages that mimic conventional design and yet provide a not-so-subtle challenge to users and the World Wide Web. Greenpeace, while relying on the common structure of a file-not-found page, unsettles the viewer by exhibiting a list of environmental powder kegs (and possibly critiquing the ephemeral nature of the World Wide Web and digital data archives). Similarly, the Environmental Defense Fund relies on traditional website design (main or dominant subject with additional links for further information and action) that invites exploration without projecting a form of radicalism that may deter the site's users in spite of the very polemic nature of its topic. Both websites illustrate subtle yet effective ways by which to inform and provoke users into further activism, whatever their personal definition of the term may be.

4.9 Digital Materiality and Activism

Do climate-change campaigns existing solely online have as much impact as those campaigns that ask for direct, physical protest? One could answer, "yes," because online and offline activists do not quit just because the medium changes. Digital materiality suggests a more inclusive approach for online activism as well as more recognition of the ubiquity of digital technologies in direct, physical protests. There are many ways in which online activism is connected to offline activism, and many ways in which offline activities underline the digital movements. Ultimately, lived experiences are imbued with digital technology and analog movements; thus, the more productive argument is not the degree to which the two forms of activism are connected or disconnected, but the forms of *participation* that digital technology facilities for our lived experiences.

In *Participation*, editor Claire Bishop lists three points that she considers essential to any definition of participatory culture in contemporary art. Taking liberties in her criteria, Bishop maintains that participation creates active subjects by the "experience of physical or symbolic participation," while establishing an ability to "determine their own social and political reality." Moreover, participation may involve a degree of collaboration, which holds the potential for

producing “unpredictability” as well as a “more positive and non-hierarchical social model.” Participation, according to Bishop, may also include a “collective responsibility” and a “restoration of the social bond through a collective elaboration of meaning” (12). One or all of these criteria, while directed at contemporary art, fit with online and offline participatory culture, especially with environmental issues, as involvement necessarily seeks to create active subjects that subvert forms of control to execute a communal sense of meaning, in this case an environmental issue. As we navigate our embodied connection with digital media, we become increasingly aware of how unaware we are of their places within our lives. Almost inevitably, we “carry them along” as we participate, but while they “carry” us along toward our goals. In other words, the presence of digital technologies in our daily lives is an augmentation of place and experience, an extension of the forum and not a question of a disembodied-embodied experience, which rightfully hovers over new-media studies. The issue becomes the acknowledgement of one’s extension into and out of digital applications. Where does one draw the line between an ongoing virtual march and the notification and organization of a physical march through social media or website? It seems that no matter how much digital participation takes place within the broad consideration of the space of the event, there are most certainly analog actions and connections as well. As Mark Nunes contends,

> [i]n the same manner that speech is embodied as a speaker, so too does the material context of all communication call upon a space in which it takes place. […] The problem of space, however, forces us to acknowledge that language, and more generally communication, is a materiality as much as it is a conceptual, symbolic system, based very much in situated moments of exchange. […] The space of language and the space of cyberspace coincide to the extent that communication takes place as both a materiality and a symbolic exchange. While the ‘electronic word’ may *transmit* as an immaterial exchange,

> it *takes place* within a context of situated materialities and practices. (*Cyberspaces of Everyday Life* 11)

While I also run the risk of extending inclusiveness too far, there are certain luxuries that digital technologies provide (at this point almost ubiquitously).

Nevertheless, Bill McKibben argues that a virtual presence does not guarantee results. In one of his many activist movements, McKibben warns against completely subscribing to the lure of an online presence. For McKibben's early group "Step It Up," (SIU),[126] a youth-centered climate-change campaign, the actions happen "in real-life" and "on the ground." McKibben states, "*the Internet is best used to get people together face-to-face*. Too many organizations have put a blind faith in the Internet, thinking that simply having a basic online presence will immediately transform their group to a cutting-edge miracle of advocacy and activism" (*Fight Global Warming* 111).

4.10 Image of the Home page for "Step It Up."

Conversely, "Stopglobalwarming.org" (SGW), a nonprofit organization, exists almost entirely on the web. More than 1,400,000 members support the campaign, including celebrities,

[126] Originally, the campaign was titled "stepitup2007.org," in reference to a specific date and a specific synced, world march. Although McKibben has started "350.org," Step It Up still remains as a visible climate-change campaign.

scientists, “average” citizens, and politicians. SGW is an ongoing “virtual march” on local, national, and world leaders. Both campaigns lobby for climate-change initiatives, yet McKibben’s group uses the internet as an information and organization site. SGW utilizes the internet as of forum of protest, a point of activism. In spite of the organizations’ common goal, one group is quick to dismiss the medium as nothing more than a simple tool while the other fully embraces its role in addressing climate change. Admittedly different, the campaigns share common approaches that demonstrate, perhaps to the dismay of the SIU team, that the internet has more of a vital and physical presence in their respective campaigns than one may initially think.

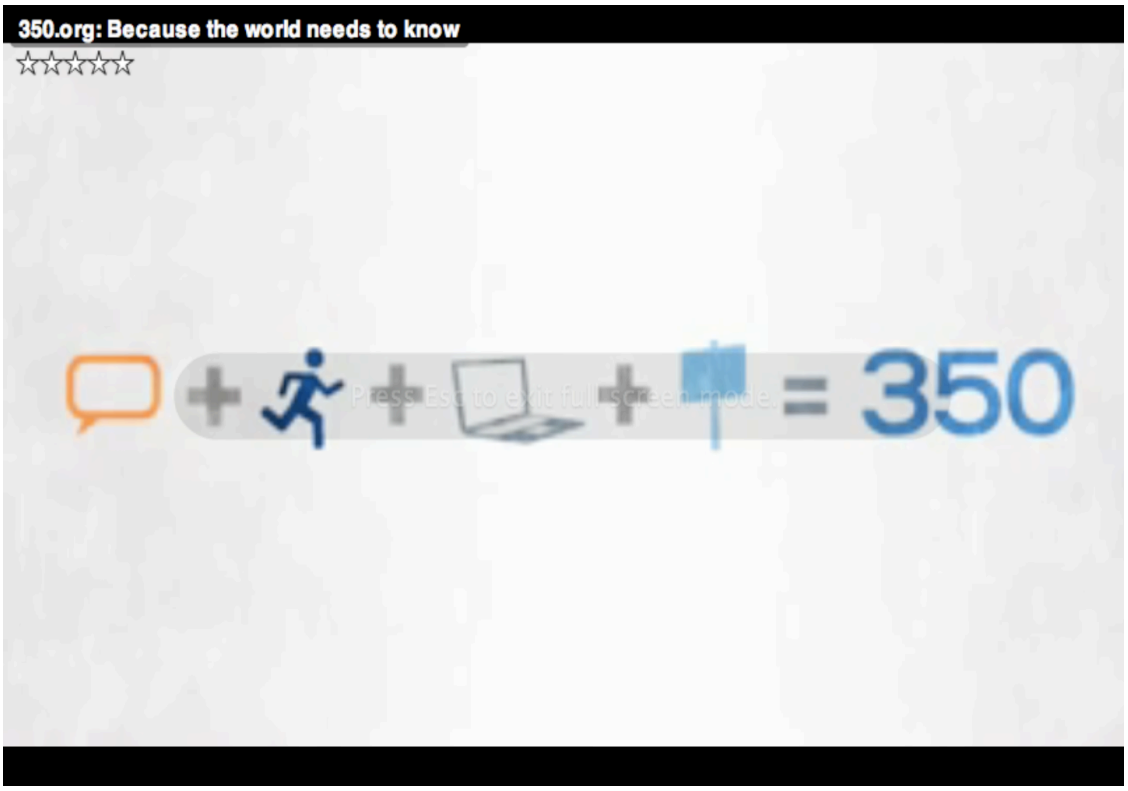
4.11 Image of home page for Stop Global Warming Now.

For the SIU campaign, the articulation (or materialization) of their goals was witnessed in the physical marches as well as in the continuation of SIU-type activism in the members’ lives away from the coordinated event. Similarly, and in spite of no physical protest, the tenets of SGW articulate in the actions of its members’ daily lives. The contrast between the two movements is SIU’s focus on physical bodies attending a physical protest versus SGW’s preference of online, ongoing virtual marches. McKibben suggests that the internet is part of a

process toward physical activism, and this can be seen in McKibben's current campaign, "350.org." However, what McKibben overlooks is that the internet is solidified in our culture; it has become our most frequented access to the world—good or bad. As generations pass and new generations are born, ideas like "mixed realities" will become antiquated (if they haven't already) and established as the reality of our world. Users embody their offline and online activism in their lived experiences.

In 350.org, McKibben's most recent climate activism group, traditional approaches are left intact. [127] Changed, or better amplified, is the online component that underlines 350.org's activism. For instance, a computer is quiet literally the central component to the 350 equation, not only in placement but also in its role as central node for connecting with the group. Moreover, the mission statement is an animated short with little print and no spoken word, necessitating the visual approaches championed by online applications. Nevertheless, discourse, physical activity, and protest make up important components of the equation for 350.org, as can be viewed with speech bubble, running person, and picket sign. The equation illustrates the complexity and inclusiveness in large-scale movements such as 350.org. Put simplistically, to be connected digitally is to be active in the analog.

[127] The argument of 350.org is that 350 parts per million (ppm) of CO2 is the absolute safe limit for humans (at the time of writing, the planet was around 391 ppm, according to the website. Worth noting, according to 350.org, the IPCC supports a 450 ppm limit). 350.org advocates a reduction of green house gases to 350 ppm as this is a "safe limit for humanity" (http://www.350.org/), but allows what James Hansen describes as the preservation of a "planet similar to that on which civilization developed and to which life on Earth is adapted" (qtd. in 350.org/about/science). Whether or not the limits 350.org are advocating is for the benefit of the nonhuman world or human "entitlement" to prosper (unchecked) on the planet is a critical question (and worth an examination of its own). For more information read "350 science" at http://www.350.org/about/science.



4.12 Image of 350.org's mission statement.

350.org bases its campaign on science; nonetheless, the group capitalizes on what Spencer R. Weart and others contend-- that "perceptions are shaped not only by scientists, but also by interest groups, politicians, and the media" (201). 350.org attempts to establish translocal ties through its global network of local activists, media connections, and political influence. The website has an updated blog that collects stories from around the globe, most specifically about the international day of climate action. The accounts range from the more personal to the political in a representation of "ordinary experts" that are "constructed from the everyday struggles of people striving to understand and negotiate their needs and desires in efforts to live a decent life" (Di Chiro, "Local Actions, Global Visions" 210). 350.org questions universal knowledge (though not discarding it), by recognizing and supporting local, community

knowledge.[128] The many and diverse voices of 350.org form communication groups and knowledge communities with other activists, resulting in a web of many-to-many networks of activists and alliances (Shirky). As an organization entrenched online, one of the key components of 350.org is "communication of knowledge" across the globe and between various demographics (Weart 204). 350.org's use of social networks such as Facebook, Twitter, YouTube, and mobile media such as the iphone give it a flexibility that is based on access. In many ways, the organization epitomizes Phil Brown's definition of popular epidemiology, which "recognize[s] the authority of knowledges built on the experiential realities of those communities most directly affected by environmental problems […] and the process by which laypersons gather scientific data and other information, and also direct and marshal the knowledge and resources of experts" (Di Chiro "Local Actions, Global Visions," 213, 215). As the campaign aggregates information from its contributors, it recognizes a more encompassing and material view of global warming, one that includes humans and nonhumans alike. Moreover, the campaigns success hinges on the dissemination of the collected knowledge, as is evident by the organization's "Spread the word page":

[128] Again, this questioning can be seen in 350.org disagreement that 450 ppm of CO2 is a safe limit, which was supported by the IPCC—often considered "the" source of climate change knowledge.

4.13 Image of 350.org's Spread the Word page.

As stated earlier in the chapter, the control of information is more easily accomplished through media such as television and newspapers that are structured from the top-down and are one-to-many media than through the internet. Yet, 350.org approaches the communication from a many-to-many platform by gathering input from anyone willing to participate. 350.org recognizes that by allowing participation from a wide group of users, campaigns have a broader range of knowledge about global warming and a better chance of being effective.[129]

McKibbens' initial doubts should, however, be read as a cautionary tale for the internet and activism. Although the medium is a productive means of addressing, informing, and protesting climate change, one of the downsides may be that the internet gives activists the illusion of "control" through monitoring and participating online. As with climate prediction, there is the underlying sensation that what is at stake is not stopping climate change but preparing oneself (or a species) as well as possible for the oncoming changes. Media like the internet facilitate participation, not only in climate activism, but in future preparations for a warmer planet. Marita Sturken argues that

> [t]he participatory illusion of the Web is thus based upon the notion that expressing opinion constitutes action, if not political engagement. But if the individualization that the Web can foster easily fits a myth of resistance through personal opinion, it also shows the ties of new technology to commodification. Indeed, the Web's appeal to the individual is often little different than an appeal to individual consumers through, in this case the selling of preparedness. (178)

Perhaps a way in which to answer Struker's apt critique is through the transparent connections of Patagonia Inc.'s "The Footprint Chronicles®" (TFC), a media text that

[129] While one could argue that the campaign is merely using the Internet as an organizational tool, it is clear by the website and its role as "campaign central" that it is very much an integral part of the activism. Where McKibben could more easily separate the role of the internet and the role of activism in his early campaign, "Step it Up," the execution of 350.org's goal would not be possible without the internet, even if one considers the internet as a surrogate to traditional activism.

exemplifies the potential change in the re-presentation not only of the environment but also of users.[130] In slight contrast to the above examples of websites, TFC acts as a self-regulatory measure for Patagonia as well as its customers. And, although Patagonia sells outdoor gear that "prepares" one for the environment, it offers very real, material ways in which consumers can avoid the need to prepare for radical climate change. The website also seeks to illuminate those culprits (such as greenhouse gases and over consumption) that do in fact contribute to climate change.

TFC, while not directly addressing climate change, illustrates the connections between the digital/analog, human/nonhuman, and exemplifies the power of embodied connections and cosmopolitan approaches to view material consequences and articulations that may otherwise go unnoticed. TFC draws attention to production, thereby disclosing the materials that do affect climate. By informing consumers of global effects, consumers can rethink their desires for purchasing product, which has an impact on climate. From a theoretical perspective, Patagonia attempts a "traceable materiality," one that is not fixed, but with many of articulations clear and semi-predictable. [131] Owner Yvon Chouinard urges customers to buy only when needed. The

[130] Full disclosure: I am a strong supporter of Patagonia. When possible, I purchase their products and do my best to advocate their company and business practices. Nevertheless, I recognize completely that the company still engages in practices—environmental, social, and economical—that are questionable even by their standards. For instance, while promoting lower carbon emissions and better materials, Patagonia has been criticized for "escaping" the carbon emissions debate by outsourcing the majority of their production as well as critiqued for their use of more "harmful" materials in the early stages of the company development, continuing even today. In spite of this, I feel that Patagonia recognizes and attempts to change its practices when it can. The company is still a business, and the profit is the bottom line. Some of the company's profits, however, go directly back into environmental and social initiatives. Certainly worth an examination, but not the focus here, is the line that Patagonia walks between harming and helping the environment. Rather than dwelling on the negatives, or flaws in Patagonia's practices, my goal is to illustrate where the company is "getting it right" through TFC as an ongoing process of reflexive reflection and progressive change and a strong example of the digital materiality I am forwarding in this project.

[131] Derrida's theory of "trace" claims that one can never completely erase the marks of an object. Not only will there always be the (erased) lines of the object, but any attempts to erase an object will leave traces. Though in the example of Patagonia, there are no attempts to "erase"; new "marks" are placed over old ones and old marks are modified. There still exists the trace of that which came before. See *Writing and Difference* and *Grammatology*.

company also has a revealing statement: "[w]e know that our business activity – from lighting stores to dyeing shirts – creates pollution as a by-product. So we work steadily to reduce those harms" ("Our Reason for Being"). [132] Patagonia uses the website as a forum for disclosure of its practices. TFC stands as a praxis for action and discussion about environmental practices. Jo Littler perhaps describes it best in commenting on Ann Klein's book, *No Logo,* by suggesting that media like websites, books, have the important ability to put critical issues on the table in ways that make them seem "popular and feasible," facilitating "the issues of mainstreaming, coalition building and creating broad-based counterhegemonies" where more traditional forms of activism often stall. "In effect," states Littler, "to discuss this is to discuss *the role of the commodity of the [medium] itself as a form of activism*" (233).

Patagonia's website is an amalgamation of their business and philosophy. It is a window (an interface beyond the interface of the computer) to a lifestyle that promotes respect for the environment as well as the practice of doing business a little lighter, a little less anthropocentric. TFC attempts to bring a degree of transparency to Patagonia Inc.'s design, production, and distribution methods while acknowledging the positive and negative features of some of their best-selling products, giving consumers (and Patagonia itself) a clearer platform from which to make decisions about their consuming practices. Patagonia Inc., while a symbol for a brand of outdoor apparel, is not the symbol of Debord or Baudrillard; it is not a copy of a representation of the geographical region. It is, as Ann Klein states, a symbol as a window to be looked through in order to engage with the materiality of lived experience (*Fences and Windows*

[132] Though there is not enough space in this essay, it would be worthy to critique Patagonia's place in an industrial capitalist market *as a for-profit company*. Patagonia, in spite of its efforts to deterritorialize the trend of the fashion market, is caught up in "industrial time." That is, they release new products at the standard times (fall, spring, summer, winter) and adhere to the "constantly producing" treadmill of capitalist products. Though they urge customers not to buy anything that is not necessary, Patagonia does not take seasons or years off from production. Barbara Adam, in *Timescapes of Modernity,* provides a strong theoretical critique. Adam argues that industrial time has made time linear, a production, and allowed many environmental hazards to go unchecked/unnoticed—but, as will be explained, Patagonia has attempted to make their production "transparent" by offering an account of some of their production steps.

246). TFC affords an opportunity for activists, consumers, and other businesses to involve themselves in environmental practices through a different type of consumer-culture practice. In Patagonia's own words:

> The Footprint Chronicles examine Patagonia's life and habits as a company. The idea is to give more of our practices some air and thought, and to change habits often played out on an industrial scale, with concomitant effects. We've been in business long enough to know that when we can reduce or eliminate a harm, other businesses will be eager to follow suit.

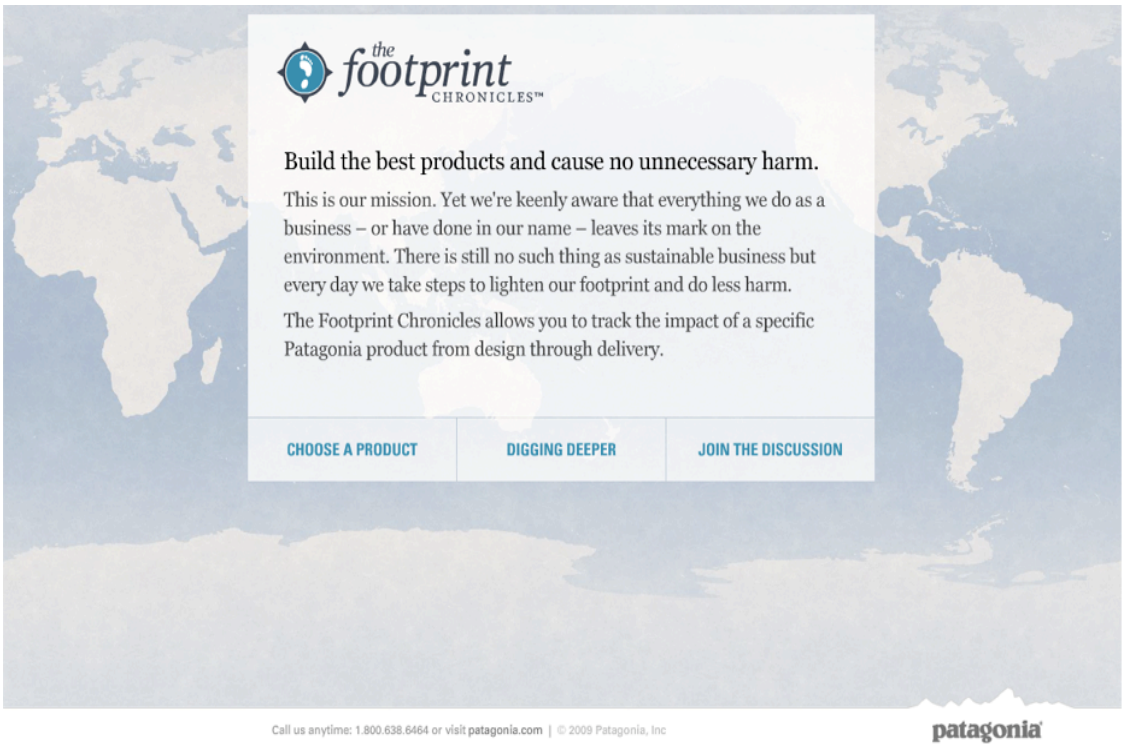
Patagonia employs a multimodal text to illustrate its goals. From words to images, the website capitalizes on "the use of several semiotic modes in the design of a semiotic product or event, together with the particular way in which these modes are combined" (Kress and Gunther 20). Discourse alone cannot completely encapsulate the trajectory of the products nor the breadth and depth of Patagonia's footprint on the planet. Yet, when the company's discourse is complemented by images, videos, color and other modes of articulation, Patagonia's footprint and lifestyle become much clearer. The medium of the website more consistently embodies Patagonia's material experiences of apparel production and environmental activism.

4.14 Image of the home page for The Footprint Chronicles®.

The home page frames Patagonia's goals, desires, and business practice. It is an "interactive mini-site" that includes videos, images, text, and user-generated comments that offer a glimpse at some of Patagonia's design, production, and distribution methods. The company's environmental and social beliefs and actions are available on the left and right of the screen. The focus of TFC is clearly given in the center. Dominating the screen is a large map, indicating the global trajectory, life, and impact of the products. Also critical to the image of the map are the words "Environmentalism: The Footprint Chronicles®," connecting the product and company to one of Patagonia's most sacred commitments, the environment. The combination of text and image presents information that could not be gathered from a single mode—text and image are necessary to the meaning-making process of TFC (Faigley et al. 7). The connection between

image and statement signals to the viewer the significance of the environment. TFC works to illuminate Patagonia's (and its consumers') material impacts on the planet.[133]

The image of the planet appears consistently throughout various TFC pages:



4.15 Image of the mission statement for The Footprint Chronicles® and Patagonia.

TFC frames Patagonia's ideals and business practices within the global context. The mission statement is bordered by (and centered within) the image of the map, indicating how ultimately Patagonia is confined and restricted by the planet. Statements such as "[b]uild the best products and cause no unnecessary harm" and "everything we do as a business […] leaves a mark on the environment," not only acknowledge the terrestrial limit but also provide an image re-presentation of the "footprints" across the globe, leaving signifying marks (and alluding to

[133] Now, clearly while examining the site, the viewer would notice the "shop clothing & gear" and the shopping cart on the upper left and right, respectively, of the screen. Patagonia is a business; it sells apparel. While it subscribes to industrial practices, the company uses the practices to support environmental initiatives. Although not entirely justifying their capitalistic practices, it is their belief to change through business.

material consequences) on the planet. In other words the image of planetary containment and human signifying practices on the globe indicate the very material ways in which Patagonia limits and is limited by its practices. The company subtly admits that it cannot (and more importantly would not) change the limits of the world and therefore must change its material practices. In spite of these perceived and material limits, the human and nonhuman worlds are not at odds. Patagonia's design seems to indicate this with its framing decisions. The juxtaposition of text and image connect to and compliment one another visually through the subtle hues, transparent and quadrilateral framing, and placement (on) to the map. From a design standpoint, TFC illustrates how, according to Guther Kress and Theo Van Leeuwen, "elements of a composition may be connected to each other, through the absence of disconnection devices, through vectors, and through continuities and similarities in colour, visual shape and so on" (*Multimodal Discourse* 2) Per Patagonia's statement, the human and nonhuman worlds are not separate. By altering consuming practices, and understanding the connections and compliments, the two can reach a greater degree of harmony. Patagonia's web-design team appears to have made a conscious effort to show the connections and not disconnections because "disconnected elements will be read as, in some sense, separate and independent, perhaps even as contrasting units of meaning, whereas connected elements will be read as belonging together in some sense as continuous or complementary" (*Multimodal Discourse* 2).

The incorporation of the virtual and physical worlds to achieve their goals becomes critical for Patagonia. New-media technology and the multimodal approach establish a virtual map of the physical practices while reflecting on the past and present, while projecting a direction for the future of the company and the consumer. By encouraging feedback and transparency, consumers can incorporate their lived experiences into Patagonia's. More importantly, however, through the TFC, consumers can decide whether Patagonia's products fit their lived experiences.

4.16 Image of “choose apparel” in order to view the “footprint.”

The locus of TFC, the product selection, gives users a list and explanation of the resources and emissions that go into each product. The digital, material connection re-presents the products as a variation of what consumers may experience. The apparel signify Patagonia’s social reality, its values, and ways of living, as well as how the consumers may attach themselves to similar ideas. The products are re-presented as items that require a litany of materials and an exhaustive process to reach the shelves and not just clothing apparel. Reading or hearing about the apparel does not provide consumers with the same impact as connecting the “life” of their apparel on the screen to the apparel on their bodies. The apparel as digital and material re-production experience establishes a stronger potential connection for the consumer because it offers associations between the clothing, production methods, customers, and the material world. The emphasis of articulation rests on the apparel as digital/material signifier to the translation of apparel-in-lived-experience for customers.

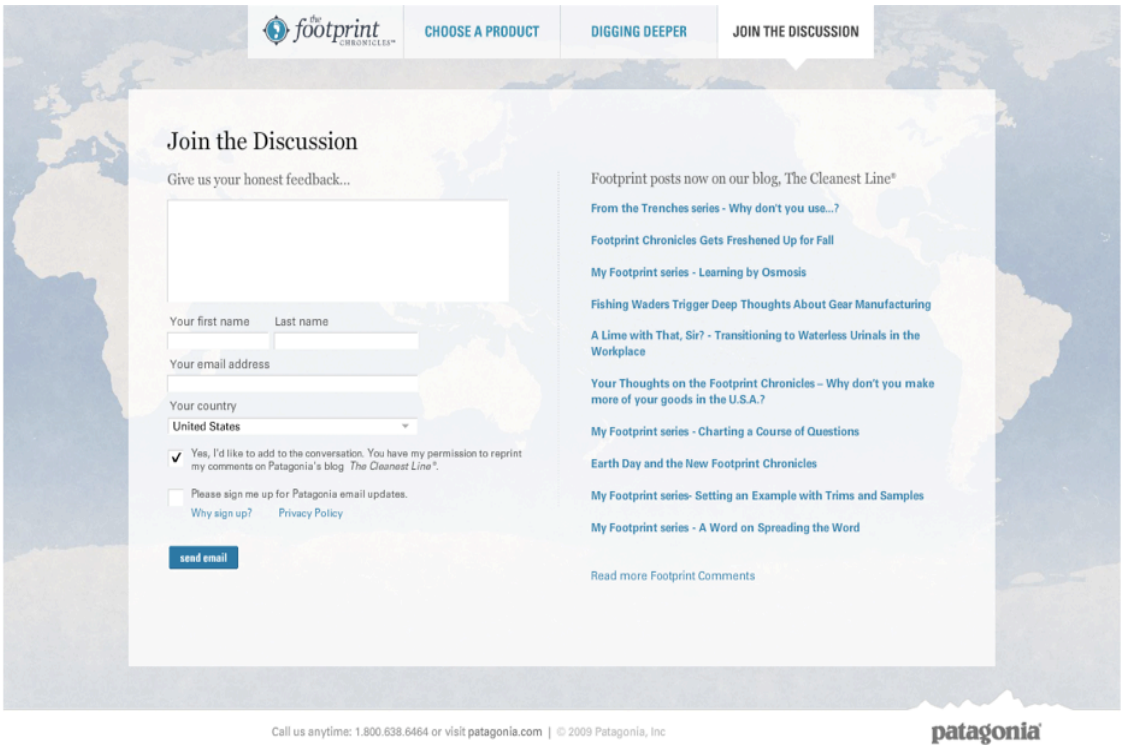
4.17 Image of the explanation of resources and positives and negatives of the garment.

Choosing a product to evaluate further connects the consumer to the material life of the product as the consumer travels the information from design to production. The arrows crossing the image of the map trace the materiality across two (and sometimes three) hemispheres and bring into more perspective the composition of the garment. Viewers' experiences with the product's early life digitally materializes as they gain an access and familiarity that would otherwise be unavailable to them. Just as digital applications provide an intimate connection to elements of climate change, so too does TFC facilitate a degree of intelligibility that is lost in "traditional" capitalistic ventures. While clothing must have labels that declare the materials, clothing manufactures do not have to divulge the origins and manufacturing process of the garments.

TFC includes images, text, and video to provide the consumer as revealing a look into the processes of production as one could hope to have. While the map illustrates the trajectory of the garment's construction process, the text describes what effects—good and bad—the construction has on the environment. By clicking on the symbols next to the garment, users can learn the "data" involved in production. For example, the "Men's Nano Puff Pullover" generates almost 6 lbs. of CO2 emissions "approximately 11 times the weight of one Men's Nano Puff Pullover" (http://www.patagonia.com/web/us/footprint/). The data materializes the life of the product from design to distribution as well as the intangible elements that make up its construction. The "Nano Puff," while a material garment that is tangible, is also a garment that, when illuminated by the website, is comprised of less tangible materials as well. In this example, not only is the pullover made of tactile threads, but also 11 times its weight in carbon dioxide. While the latter seems presumptuous, the intangible materials that go into the product's production undoubtedly have material affects on the planet, in this case, 6 lbs. of carbon emissions into the atmosphere. The garment is a pullover AND 6 lbs. of carbon emissions AND the distance traveled AND the cost … AND the many combinations that articulate the consumer's and the pullover's lives. The AND is not an equal or an "is"; rather, materially, AND acts as a hybrid of the conjunction and (the arrow of science), indicating the possible, potential, virtual, in other words, variations of the material real. The 6 lbs. of carbon emission of the production of the pullover are not technically the pullover, but a variation of the "real" pullover, an articulated potential. While uninformed consumers are probably not aware of these variations, TFC, to use Delueze and Guattari's expression, adopts "the role of *tensor*" by illustrating some of the ways in which the conjunctions between garment, human, and nonhuman are in "continuous variation" (*Thousand Plateaus* 99). Not only are the material and potential conjunctions illustrated, but TFC, as tensor, "effects a kind of transitivization of the [garment], causing the last [conjunction] to react upon the preceding [conjunction] back through the entire chain" (99). TFC identifies some of the relationships between inputs and outputs by

extending the notions of the garment's life and composition. TFC provides a frame of reference for seemingly disparate things (carbon emissions and pullover, for instance) by demonstrating the relationships of the very material and potential assemblages of the garment. The multimodal design illuminates the composition of the product and production of the articulated in the life of the garments.

While the website provides many links for further examination and involvement, i.e., the ways in which TFC "build[s] upon and refer[s] to other texts"—the site's "intertextuality,"the most significant "link" is to the company and users lived experience (Faigley et al. 16). The most important intertextual connections are the ones that the company and the users make between the products and their lived experience. The point of TFC is to insert itself into and augment the consuming practices and the company itself by remaining materially significant to the company's and customer's lived experiences. This intertextuality (or inter-experientiality) is perhaps best gathered through the often-revealing feedback left by users and Patagonia employees. For Patagonia, TFC is an always ongoing examination of its business and lifestyle practices. Customers (anyone actually) are encouraged to participate in the process.



4.18 Image of the login portal for providing feedback.

TFC positions itself as a forum through which company and user can engage in meaningful, and often heated, discussions about the products and politics of Patagonia and beyond. TFC and Patagonia's discussion take place on "The Cleanest Line" a blog run by the company and dedicated to all things Patagonia. (Even the title of the blog reflects Patagonia's environmental beliefs. A climbing term, *the cleanest line* refers to a climbing route that has the least impact and obstruction by the climber.) The "My Footprint" series is an employee- and customer-based discussion in which personal narrative dominates technical jargon. The discussions address the need for more environmental legislature, the benefits of the outdoors, or positive environmental changes, i.e., mostly pro-environment ideals. Yet, in several cases, the discussions have turned into debates in which Patagonia employees defend the "hypocrisy" of the company for manufacturing in countries with poor environmental and human-rights records. In spite of the occasional dissension toward the company and its practices, the forum is always open for

informative discussion. In addition to the importance of the complementary positioning of discourse upon the world map, the key feature of "discourse" for the website and the company is the term in action, as a verb. Put another way, while many designs focus on the presentation of the lettering of the discourse, the key for TFC is that discourse happens not only on the site but also in the material experiences of the employees and users.

Although persuasive as a medium for disseminating information about certain environmental issues involved in design, production, and distribution, the success of TFC comes from the virtual embodiment of Patagonia's physical agencies. The role of media in the ecology of Patagonia, consumer, and the nonhuman world resists the notion that TFC is an isolated text with little impact on/from the material world. Quite the opposite, in fact, connecting Patagonia's virtual model provides a more material recognition of the life of the product and the goals of the company for the consumer, which undermines the "myth of resistance" that critics claim the Web offers.

The materiality of Patagonia capitalizes on language, image, and involved citizens. Implicitly, if not explicitly, Patagonia, like the Environmental Justice movement, considers the "environment to be "the place you live, the place you work, the place you play" (Di Chiro, "Nature as Community" 301). For Patagonia, the environment is a lived environment in which humans are an integral part. In addition, seeking traditional, "nature" rights such as "leaving no trace" and preserve wilderness stretches, Patagonia seeks social justice for employees, activists, and consumers.[134] This approach complements traditional environmental concerns by demonstrating how intricately and extensively the human and nonhuman worlds are connected.

Patagonia is proposing is a "community" of concerned and invested individuals. The Patagonia community participates in environmental initiatives through multiple forms of resistance, most notably consuming practices. The TFC (and websites like it) provides points of

[134] Patagonia has attempted to contract suppliers that respect and support ethical labor and farm practices as well as providing bail money for employees who have been jailed as a result of non-violent civil protest.

disturbance within the system in which they operate. For TFC the "disturbance" makes more transparent a view of the pre-consumer life of a product within the capitalist and fashion hungry-system that is notoriously opaque. With its production methods and values exposed, Patagonia leaves the choice of purchase and involvement to consumers. In, *Tactical Media*, Rita Raley examines art's ability to "disturb" as a form of activism. TFC performs a similar role. For Raley, media installations are not alternatives but disturbances within the context in which they operate (global capitalism for the author). Tactical media articulate moments of resistance in which the disturbance carries over to the users' lives away from the media installation. As a form of tactical media, TFC works within systems of production and consumption but refuses to adhere to the rigidity of industrial structures. Consumers, then, participate in a disturbance that—through activism, consumption, or even wearing Patagonia apparel—literally asks the question, "why can't we change the system?" Or at the very least, have the information to mitigate participation in it.

Patagonia invites participation by offering a view of the methods and materials of production. Viewers become users (as consumers) by choosing to purchase a product (or not) and using (or performing with) the product in the material world. Although users cannot physically be a part of the production process, they can choose to buy (an ultimate act of support *and* involvement in the industrial process that places the environment at risk) and integrate the product into their life in various ways. While Patagonia produces the garment and initiates the production of it in semiotic terms through the website, the consumer ultimately provides meaning to the garment by how he/she does (not) use it. In other words, "production" does not end with Patagonia, but ultimately with the consumer, who, "adds meanings which flow directly from the physical process of articulation and the physical qualities of the materials used" (*Multimodal Discourse* 21). Through its production and design values, TFC attempts to show how products and the material world fit and *may* fit together. While the raw materials and conceptual reasons are given, not until the product enters the lived experience of the user is

meaning formed. Echoed (and modeled) in TFC: it is not so much the product itself that is important for Patagonia, but the life of the product under the company's care, the trajectory, the product in action, and so on.

4.10 Conclusion

In "Beyond Consumerism," Kate Soper claims that consumption has become a "site of new forms of political engagement, ethical consideration and aesthetic representation" (92-93). These "alternative hedonisms," as she states, provide alternative means of consumption to the "good life." For Soper, alternative hedonism disturbs traditional hedonism, based on consumer goods, by advocating pleasure-seeking in areas that promote health, community, and "human" existence.

But while consumption will unavoidably be at the root of our approach and solution to climate change, what also takes hold of climate campaigns are the narratives that inform them. Gregory Ulmer, in *Electronic Monuments*, argues for the online memorial that that collects individual voices and makes them available to the/a community. The "MEmorial, as Ulmer terms it, consists of the voices of the individuals as testimonies (which are more closely related to faith than hard fact). While the above examples, from 350.org to "The Footprint Chronicles®" certainly stand as a collection of voices from the community, it is important to note that global climate-change campaigns through various multimodal approaches "reinvents [the] polymorphism of bodily possibilities. Its culture is a bricolage, where boundaries and distinctions are blurred, parts interchanged, hybrids produced" (Ihde, *Bodies* 13). Climate change campaigns utilize the polymorphy of bodily possibilities (both human and nonhuman) as a collective production of resistance. And, whether online and/or offline, campaigns are working to end global warming or other problems. Although some campaigns are not entirely explicit about changing cultural approaches to the climate crisis, it follows that addressing the entire materiality of the situation, the obvious and not-so-obvious connections, is paramount. The internet and climate-change campaigns are particularly suited for exposing materiality and

shifting the cultural approach to climate change. Access proves the critical feature of the digital applications, but an access that illuminates the materiality of the applications as well as the articulations of consequences in the material world. The “living web,” the constantly–being-updated information space, changes people’s lives through their connections and what those connections ultimately mean to material consequences.

350.org, the Smithsonian Climate Education Online Conference and less directly Patagonia’s The Footprint Chronicles® exemplify how the internet and climate-change campaigns are particularly suited for disclosing materiality and shifting cultural approaches. They augment the material through re-presentations. For campaigns like “Step It Up,” “Stop Global Warming Now,” and “350.org,” an assorted grouping of ordinary people drive the movements. They provide diverse perspectives as well as continual involvement that keep the movements relevant. TFC and the Smithsonian conference demonstrate how digital applications to material experiences can not only track the lives of products and receding icecaps but also how viewers can incorporate their lived experiences through the transparency and information provided through the websites. Participation from a wide group of users, an approach not common to top-down models, provides a better chance for fighting climate change. Participation, not only in the movements, but also in the intra-active process of meaning and consequence.

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

"Articulations," "Disclosures," "Mangles," "Meaning Consequentialism," "Trans-corporeality," "Viscous Porosity," and the many other terms and theories employed in this project all constitute the idea of active and in progress materiality and meaning that is the undertow of modern life in an increasingly complex world (because more of "reality" is disclosed). The tenants of this project are nothing new, but I want to stress the importance of interaction with materiality. None of these theoretical considerations predict or ensure meaning or action, nor are any of them certain. At best they provide maps from which to guide and gauge the world, providing what Hekman considers the ability to compare realities and make decisions based on the material disclosures (*Material of Knowledge* 127).

The certainty of environmental awareness and action yields to the complexity and uneasiness of assigning material signification to language and digital practices. This contention will remain, so to speak, un-consequentially. From the inability to predict meaning in the future to the stability of digital presentations, the trajectory of climate action, while mapped, is restricted to time. Thinkers such as Stewart Brand and Paul Virilio argue the compression of time that makes the past, present, and future the now. For both individuals, the increase of pace, scale, and the compression of distance (geographically and temporally) is a reality.[135] To

[135] In *Open Sky*, for example, Virilio examines what happens when speed (and speed of light) becomes the standard for terrestrial and spatial measurement. Upon the advent of instant, real-time communication, distances shrank and geography became less important. Human achievements are not measured in distance, whether temporally or geographically, but by the instant speed in which communications is executed. Essentially, Virilio argues the effects of speed on temporal/distance compression and its effects (potential or otherwise) on the planet, noting that much of these effects have to do with advances in technology, especially transport and communication. Instant communication and trans-Atlantic fights have ushered the world into a real time, a world time, clocked by communication. While time should occupy a more significant role in this dissertation project, it does not. Nevertheless, questions of time do inform this project (to a greater degree than is present on the written page). Time, in addition to belief and socio-economic standing, is the great equalizer in environmental issues.

be aware of and act on climate change requires a broad understanding of the past as well as potentials for the future. Furthermore, this awareness challenges what it means to live physically on a planet that changes outside of human scale. Not a slow change, such as the shift of tectonic plates, climate change's effects are more considerable than those experienced in the human life expectancy. Questions of time aside, the underlining issue in this project stands that because of the difficulty of material connections and associations with the phenomenon, language representations (in all of their temporality) and digital applications have to be essential to the material conditions and consequences of climate change and other complex environmental issues.

The landscapes and opinions of the world have continued to change since the beginning of this dissertation project. Some polls seem to indicate a renewed belief in climate change even as the country continues to struggle through economic hard times. A poll, commissioned by researchers at Yale and George Mason universities, states "69 percent of respondents" agree that climate change impacts the weather in the United States, and that the "erratic weather [of recent years] may be convincing some people that the problem is no longer just a vague and distant threat" ("One Disaster"). In the short span of writing this dissertation, public opinion has swayed from belief, to doubt, and back to belief about the correlations and impacts of a radically changing climate of the world. A once immediate threat became distant and ambiguous among the panic of economic hardship as well as the loud cries of climate change skeptics. But with the warm and erratic weather, the amorphous materiality of climate change and its implications have gained discernible and definable consequences. Interestingly, the poll notes that while the public still carries an almost singular view that climate change relates to heat waves and not necessarily extreme weather such as floods and above-average snowfall, "35 percent of the public reported being affected by extreme weather in the past year" ("One Disaster").

The last few years or so have brought forward more digital re-presentations of the natural world. The trend looks to continue. *Anthropocene*, for example, is a website in beta testing that aims to visually illustrate "a planet transformed by humanity." *Anthropocene* uses highly detailed images and "scientific data" to articulate a clearer picture of anthropocentric footprints on the planet. In its authors' words,

> *Anthropocene* is a website which is designed to improve our collective understanding of the Earth system. The site aims to inspire, educate and engage people about humanity's impact on Earth. Its unique combination of high-level scientific data and powerful imagery will help people visualize and better understand humanity's geographic imprint in recent time. ("About")

Anthropocene addresses the impacts, good and bad, of human activity and provides an explanation with visual images. Alermia, Spain, according to *Anthropocene*, has built 26,000 hectares of greenhouses in the last 30 years. The number of greenhouses and the white roofs that reflect heat and light have *lowered* temperatures in the area by 0.3 degrees while the rest of Spain has shown an increase in temperature ("Gallery, Almerica, Spain"). While not completely revealing, the website marks Almeria with a blue and black dot, signifying the location on the map and planet. Viewers are able to zoom in on Almeria and look at what are presumably the proliferations of greenhouses in the area. The combination of text and imagery allows viewers to see humanity's impact and understand the implications within the greater question of the planet. The combination of text and image, in this example, provide the very material (and concrete) visualization of the greenhouses and the geographical region and, more importantly, the very material (if only by meaning) geographic and atmospheric consequences of more unintelligible elements like the decrease in temperature in an otherwise warming region. As Stephen Yarborough suggests, the use of such a "tool" affects the way we view "new topical relationships and new objects of our attention and discourse [and] affects the character of the questions and problems that define the discursive situation itself" ("Very Idea" 498). The

introduction of these objects (and others commented upon in the project) potentially changes the discourse about and relations to the material environment. Al Gore's personal, political, and scientific presentation is a break from the partisan and science based approaches of the past. Gore's approach is nothing new (see McKibben), and it arguably benefited from Gore's opposition to the Bush administration, but the approach did attempt to establish a more intimate and revealing link between the human and nonhuman world. Moreover, Gore's narrative and performative approach implies a desire to speak more commonly about climate change as well as more directly to a general audience.

As another example, Patagonia continues to push forward. In late 2012, the company re-launched the Foot Print Chronicles® website, shifting the focus from the environmental impacts detailed in chapter 4 to an account of the company's social practices in the factories that supply the material for and make its products. The CO_2 emissions of a product are no longer given, but the factory conditions for the workers are. Such a move, while disappointing to some (this author, for example), nevertheless continues the intra-active flows of materialism of providing transparency and more overt connections between the nonhuman and human (and human again in this example). Many of the environmental thinkers I use in this project are interested in more human issues such as the social conditions of workers.[136] Similarly, many of the digital and language scholars I take from are profoundly interested in social conditions, politics, and power. In addition to the diverse application of ideas provided by these thinkers to a host of "world" issues, this transition of "materials" reflects the intra-action I value in this project and from these inspiring thinkers. That is, I value, the concerted effort to think about and apply oneself diversely to any issue, but conversely, it is important to remain open to the diverse

[136] Deborah Brandt investigates the environmental and social implications of tomatoes in her work *Tangled Routes: Women, Work, and Globalization on the Tomato Trail*. Like Patagonia's attempts to add transparency to the environmental and social implications of its products, Brandt forwards a transparency of tomatoes by examining their journey from Mexico to Canada along the NAFTA route. Within this examination, Brandt focuses on the agricultural practices, migrant workers (mostly female), working conditions, pay, pesticides, and the corporate tomato.

thought and nonhuman materialities making up these issues.

Patagonia founder Yvon Chouinard delivers a telling example of the potential shifts in materiality and materiality-as-meaning-making by re-telling the dramatic changes Walmart incorporated in 2008. According to Chouinard, after suffering a loss in customers and overall reputation, the company decided to change its environmental practices. They eliminated packaging and modified their shipping fleet to cut idling time. As a result, the company saved millions of dollars (11). The example, and many like it, expresses the very (although initially costly) shift in thinking about materiality and the long-term effects of practices. What Walmart thought was a lucrative model, was actually costing them money and reputation (which translates to money).

Walmart's shift, as well as many of the environmental and social principles that define Patagonia as a company, are the result of action and concern from everyday citizens. Walmart's shift highlights corporate concerns for a "bottom line" that is supported by sales but also considers community. As one of the biggest companies in the world, Walmart has the luxury of a huge consumer base and an awareness of that base. Appealing to this constituency maintains sales and also ensures some "environmental credibility" and continual awareness. Patagonia, in contrast to Walmart, has almost always put environmental and social considerations at the forefront of its business decisions. Nevertheless, both examples of business practices understand that the environment has become "more material" in the eyes of their consumers and the company's bottom line.

In his earlier work on popular environmental movements, Andrew Szasz, describes "Ecopopulism" as environmental movements that are "popular" in reception and commitment. The movements often start local, catch the popular eye—usually due to media treatment—and become concerns of the masses, even if the masses are "not affected" by the problem. This movement is clearly reflected in Walmart's and Patagonia's business decisions. Szasz writes about the toxic waste movement, which at first had little concern in the public's eye. But, after

much local, grassroots activism and coverage by the media, the toxic waste movement became a national concern (the fight then became regulation vs. reduction). Szasz argues that ecopopulism is most effective when environmental problems transgress borders, as the toxic waste movement did. Here, the issue was very much about the trafficking, disposal, storage, and location of toxic waste, but also about what communities were affected by toxic waste. And while not as "toxic" as the waste Szasz addresses, both Walmart and Patagonia have environmental practices that have caught the popular eye. Walmart's reshuffling speaks directly to the level of daily and ongoing awareness that occupy consumers' thoughts and (wallet) actions. Walmart is an example of Szasz's theory that individuals often become involved in environmental, social, or other movements at any given time. This involvement speaks to the development of what Szasz considers average indifferent persons who are not immediately engaged in activism but become staunch activists.

Patagonia's new focus, while rightfully acknowledging (and advertising) the environmental and social achievements of the suppliers, directs readers to a synopsis of the company and provides less explanation about the materials of the company's garments. Again, the move is justifiable because it adds transparency to the environmental and social commitments of the suppliers for Patagonia customers; however, at the same time, the move curtails the materiality previously established by the website's inclusion of the transportation of garments and raw materials needed to produce them. While the customer knows more about a specific supplier, s/he knows less about the material properties that constitute a specific garment. Again, this move (rightly or wrongly) reflects an "ecopolism" (here environmental and social justice) that waxes and wanes in reception. The general attention to the garment, industry, and practice is still present in the revised "The Footprint Chronicles®," but much of the potentiality of the process has been removed. Nevertheless, customers have some degree of comfort knowing that the factory employees' are not subject to harsh working conditions. (And

Walmart consumers rest a little easier knowing that the company has joined a “popular” movement that reduces environmental harm.)

In his most recent book, Yvon Chouinard (with Vincent Stanley) addresses the business trajectory and model of Patagonia and its ties to the environment. Chouinard eschews the term “sustainability” in favor of “responsibility,” arguing that no company is sustainable, but many companies take responsible approaches to their business practices and the environment. Chouinard echoes the discussion of digital media laid out in chapter four. Delighted by the shift from a hierarchical and horizontal mode of information (and reporting) access, Chouinard offers, “Any citizen with a cell-phone camera and access to a blog can now sound the neighborly alarm. Another can spread it—and will” (*Responsible Company* 6).[137] Thus, this level and proliferation of communication, while certainly still subject to the limits of power and other restrictions, opens interaction across a much broader spectrum than before. While still tied to power structures, citizens can now (although it is still difficult) produce fissures in the walls of the structures that had previously limited their actions. But, worth noting, materiality-as-meaning and human considerations of materiality (the physical stuff) are subject to the limits of social, cultural, and political factors.

In practice, one doesn’t have to look past Pierre Bourdieu and his examination of language use in social settings. While I have utilized Bourdieu’s theory at selective points in this larger project, it is worth summarizing his overall theory of language as power in this concluding section. Worth noting, too, is the adaptability of this theory to arenas outside of language, i.e., digital and semiotic representations. Bourdieu examines the social implications of language. His

[137] Note, too, that Chouinard uses the adjective “neighborly” to describe the call for justice instead of a more political term, or even using no term. This suggests that much of the work happens on the ground, together, and that much of the action can and does happen outside traditional power and law structures. Citizens are media outlets, whistle blowers, and "law makers." They embody the traditional tools of investigation and reporting, but work outside of structures, the very structures that limit and dictate action. Citizens can affect action through digital and linguistic mediums. Many of the theorists and thinkers in this project advocate strongly for this approach, and many of the projects and examples they are involved in reflect this, which cannot be stressed enough.

argument is that language, though it can be studied as an abstract concept, is performed in social settings. Language for Bourdieu is dependent on social relations and power structures. Splitting from the Sausserian and Chomskian studies of an abstract language in ideal settings, Bourdieu examines language as it takes place in its social settings. Bourdieu's language is one that unifies, separates, and identifies subjects and is an exchange between speaker and listener (sender and receiver, and even sign and interpretation). This exchange is a capital in market terms. The speaker has an item to "sell" to the listener, placing him/her in a position of power. In addition to the capital of language, there are also social and economic capitals that play roles in the exchange of language. For example, one's class determines the speech and reception of speech. According to Bourdieu, the proletariat have different speech patterns than the bourgeois and receive (often negatively) the speech of the bourgeois differently. In short, unlike Saussure and Chomsky, who focus on an isolated language analysis, Bourdieu focuses on the social (using the term broadly) conditions surrounding language. In contrast, J.L. Austin's use of performative utterances, though correct in its analysis of language and action, fails to recognize the power structure of the actions. Christening a ship is not something the average citizen can or does do. The act is reserved for a position of power. And though Austin's analysis of the locutionary, illocutionary, and prelocutionary forces involved in the speech act, the fact that he neglects the power structures involved is critical to Bourdieu. Because, for Bourdieu, the power structures and social conditions are where language "happens."

While the above explanations provide a more diverse and material way of looking at and interacting with the world, it also suggests an overwhelming sensation of impotence in the face of problems that results in the cynicism I suggested in the introduction. To "interact" to this level, or to surrender oneself to consequential (and not static or given) meaning, shakes the normalcy of removed and unconnected lives. Going back to the above examples, Al Gore, Walmart, and Patagonia all find themselves at different points within a power structure.

Nevertheless, all three are subject to the collective actions of the agencies each function within and the public's decisions to act.

This point gets at the central question/problem of this dissertation project: in spite of these broader, more inclusive ways of interacting with and viewing nonhuman and human relations, people are still bound to political, economical, and personal constraints that limit and greatly influence action, and in many ways, the constraints lie outside of the current environmental problems because individuals in many cases must choose "X" or the environment. While there will probably always be a debate about "global warming" few can argue against the severe weather and climate patterns of the late twentieth and early twenty-first centuries. "Something" is changing. In spite of this, much of the action has been hampered by external forces that continue to inscribe the nature/culture divide that will always put anthropocentric choices first (in many cases because there is a need to do so). The problem then is not one of "knowing" or even to some extent "doing," the problem is "knowing" and "doing" on a larger scale.

To draw this point out further, the problem stems from a lack of consensus of "beliefs" about these environmental issues or "beliefs" that anything will change. If Donald Davidson is correct that we share beliefs about a shared world, then the divergence is that these beliefs are loosely in "kind" and not "degree." For argument sake, many people believe that climate is changing, but fewer believe that this change is from global warming, and even fewer believe that the changes are a result of human influences. And the list of "fewer" can go on further. This, then, is the role of this dissertation project, to reverse the list of "fewer" and direct it toward a list of "more" material connections and relations. With this in mind, I hope that this document provides a useful map of meaningful ways to engage with the world.

5.2 Afterword: First Year Writing

As an "afterword," in the last few pages of this brief conclusion, I want to address (in passing) one final arena (in addition to the many others detailed in this project) that I believe can help individuals move past the cynical and helpless state mentioned in the conclusion. I want to address First Year Writing, not in a definitive or conclusive way because this is not a dissertation about composition studies. I do want to discuss this area, however, because it is where I have lived and worked during my tenure as a Ph.D. candidate and I am a firm believer in the importance of First Year Writing in the greater college and learning experience.

Latour argues against "Science" with a capital "S" as an institution that produces undeniable facts or universal (and indisputable truths), favoring instead "sciences" with a small "s" as an institution that composes. In reference to the 2009 Copenhgen climate summit and ensuing scandal over hacked email accounts that "revealed" manipulated and massaged data about climate change, Latour points out the failure of addressing difference between compositions that are done "well" and those that are done "badly" (478). [138] While First Year Writers do not generally dwell too deeply on, "the old opposition between what is constructed and what is not constructed," as Latour laments, they certainly do participate in "the slight but crucial difference between what is *well* and what is *badly* constructed (or composed)" (478). Compositionists, as Latour names his theoretical group of mythbusters, clash with large universal tropes that offer easy or modernist answers (that there *is* an answer to be found). First Year Writing practices teach students that arguments do not have "Answers"; they are contingent upon a multitude of elements such as audience, author, purpose, evidence. Thus,

[138] Latour argues, and quite rightly I think, that to think that science is not a process of composing, navigating, and mining data, politics, and cultural influence is misguided. All sciences, it seems, are a process of discovery of which very few reach a universal and indisputable truth… at least not without many failed and questionable attempts.

composing a position that one believes strongly is as much about *well-constructed* (or composed in Latour's term) arguments than about the argument itself.

> In other words, compositionism takes up the task of searching for universality but without believing that this universality is already there, waiting to be unveiled and discovered. It is thus as far from relativism (in the papal sense of the word) as it is from universalism (in the modernist meaning of the world—more on this later). From universalism it takes up the task of building a common world; from relativism, the certainty that this common world has to be built from utterly heterogeneous parts that will never make a whole, but at best a fragile, revisable, and diverse composite material. ("Compositionist Manifesto" 474)

Much of what has been discussed in this dissertation project pursues similar goals as of those Latour describes. Few, if any, of the scholars argue for universal truths. As a writer, however, I am employing their theories as if there is a more universal way to understand our connections to the nonhuman world. I am seeking a "common world," and not only one such as Davidson suggests, but also one that is well constructed. To speak reductively, the theorists that inform my thinking all have an overlapping approach: they understand and promote diverse and non-fixed ways of engaging with the world. This approach translates well into First Year Writing courses that focus on more process-driven writing and, perhaps more importantly, broader consideration of audience and context. One branch of First Year Writing that serves this purpose quite well is Ecocomposition. Rather than addressing writing practices, I will focus instead on the word-world connection as I generally see it in the classroom.

In the essay "Breaking Ground in Ecocomposition: Exploring Relationships between Discourse and Environment," authors Sidney I. Dobrin and Chistian R. Weisser explain "ecocomposition" (567) as a sub-discipline of English studies that examines the interactions between "writers and the social forces that acted upon them and upon which they had effect" (568). Ecocomposition, like many of the disciplines under the "environmental criticism" umbrella

(Buell, *Environmental Criticism* viii), considers place and environment a critical category in the development of writing. By questioning the individual writer as autonomous producer of discourse via poststructuralism, ecocomposition strives to engender an awareness of the reciprocal interaction between humans and the environment and, moreover, the environment's influence on the humans. Because this approach brings into question traditional views of androcentrism, anthropocentrism, and anthropomorphism (Buell 10), it has obvious value to the goals of this project.

Ecocomposition is a nascent field. The authors date its inception to the end of the 20th century (Dobrin and Weisser 567-68). Ecocomposition, to use Lawrence Buell's terminology, most closely resembles a "second-wave" environmental criticism not only for its recognition of natural and constructed environments, but also for the understanding that "discourse" between human and these environments is reciprocal (22, 19). The authors illustrate this correlation best, claiming that ecocomposition is

> the study of the relationships between environments (… natural, constructed, and even imagined places) and discourse (speaking, writing, and thinking). Ecocomposition draws from disciplines that study discourse (primarily composition, but also including literary studies, communication, cultural studies, linguistics, and philosophy) and merges their perspectives with work in disciplines that examine environment (these include ecology, environmental studies, sociobiology, and other "hard" sciences). As a result, ecocomposition attempts to provide a holistic, encompassing framework for studies of the relationship between discourse and environment. (572)

Though the above definition speaks to the broad range of disciplines, scholars have contributed the disciplines inception to three major fields: composition, ecocriticism, and environmental rhetoric.

The authors cite the work of Marilyn Cooper and Richard M. Coe in composition as foundational for ecocomposition because they model a composition based on ecology.

Composition, when viewed ecologically, considers the interrelationships between writers and environment, i.e., the role of place as a critical category for examination. Both Cooper and Coe articulate how discourse interacts with "systems" or environments. For Cooper, systems are "socially constituted" and engage in a recursive process with writers daily. Writing then, is not an individual process, but one that is reliant upon these systems. Similarly, for Coe, rhetoric and language traditionally separate humans and nature, though, at the same time, rhetoric and language express how humans function with nature. When writers move from one system or environment to another or engage with overlapping systems, their discourse shifts to match the system. Ecocomposition, then, seeks to illustrate how writing both affects and is affected by one's experience in environments (568-80).

Ecocriticism, like composition, is equally influential in the development of ecocomposition. According to the authors, the term ecocriticism describes the study of the connections between literature and the physical environment (569). Ecocriticism, the movement, not only examines nature and literature but also theorizes that place, like race, class, and gender, is a critical category and that human culture affects and is affected by the physical world (569). However, ecocomposition is not ecocriticism. Ecocomposition moves from the textual interpretation of ecocriticism to the "textual production and the environments that affect and are affected by the production of discourse" (577). In other words, ecocomposition looks beyond the literary world of ecocriticism by attempting to mesh it with the material world.

Emerging at about the same time as ecocriticism, environmental rhetoric is the final major influential discipline of ecocomposition. Environmental rhetoric analyzes the connections between discourse and environment, recognizing how discourse influences perceptions of the world. Moreover, environmental rhetoric acknowledges "our interdependence with others and our interconnectedness with a larger biosphere" (579-80).

From the ideas attributed to composition, ecocriticism, and environmental rhetoric, ecocomposition has strived to develop a pedagogy that examines the interrelationship between

writer and environments. The first approach is “ecological literacy” which aims to produce an awareness of place, environment, and the world (581). In the ecological literacy classroom, students “converse” with environments and members of other communities. The goal of the classroom is to give students multiple perspectives in order that they can develop their own perspectives (582). The second approach is “discursive ecology” which posits that writers affect and are affected by the environment they inhabit. Discursive ecology examines the relationship between writing and surrounding environments by focusing on the “ecologies of writing” over textual interpretation (584).

As the pedagogical applications of ecocomposition have pointed out, one value of ecocomposition is the de-centering of the subject-object binary or hierarchy by including place on the list of critical categories in the development of writers in post-process composition. The inclusion of place forces writers to consider, for example, how living in urban environments and rural environments affects their production of discourse and how their discourse in turn affects these environments. For ecocomposition, place, as much as gender, culture, race, and class, act upon and are acted upon by the writer; it is fundamental in both production and lived experience.

Along with the inclusion of place, ecocomposition adopts environmental rhetoric’s interest in analyzing both the use and production of discourse surrounding environmental issues. Discourse, according to environmental rhetoricians, is essential in detailing and forming the world and is a tool for action (579). Much of ecocomposition then focuses on the understanding and application of discourse in varied environments. Writers in the ecocomposition classroom come to understand place and environment not as something they act upon through their discourse, but as systems that influence the discourse writers produce to express place and environment. As the systems overlap with other systems or change altogether, so does the discourse of the writers. Reciprocally, writers affect the environments with the discourse they employ as much as the environments affect the writers. In short, through

discourse, writers produce environments and environments produce writers. As noted in the introduction, this means devaluing of certain human "-isms" (Buell 10). Writers reconsider the traditional concepts of humans as the "center" of the world (anthropocentrism), the world from the masculine point of view (androcentrism) and the humanizing of the world (anthropomorphism).

However, it may be apparent that such a discursive approach to the environment can prove problematic because it implies that the only access to the environment is through language and discourse. Such an approach neglects the material for the discursive. A strong focus on poststructuralist applications to discourse risks "the totalizing implications of its linguistic turn and its aftermaths, such that the word-world gets decoupled from the material world making it impossible to conceive of … discourse as other than tropology or linguistic play or ideological formation" (Beull 10). This decoupling of word-world from material world can be seen in ecocomposition's limiting focus on discourse. For authors Dobrin and Weisser, reality is socially constructed and "[t]he environment is an idea created through discourse" (573). They are quick to point out that the natural, physical world does exist; however, only through discourse does this world have any meaning (573). The authors complicate the discursive theory by dividing human life into two spheres: the "biosphere" (the physical world) and the "semioshpere" (discourse) that are dependent on one another, but, they add, "there is no objective environment separate from the words we use to represent it" (574). Though the relationship between discourse and environment is reciprocal, the "reciprocallity" is founded on the shaping power of the discourse and not the physicality or materiality of the physical world. If discourse is the connection between humans and environment, then the relationships seem to be one-sided because discourse determines what will be reciprocated from place and environment. In other words, the discursive interaction between humans and environment is a construct of "self-reflexive language" (Buell 31).

As a construct of self-reflexive language, human/nonhuman interaction becomes more disconcerting. If environment is not something to be found, but rather a concept constructed through human discourse, then at what point does discourse analysis turn into action? How do we act on the material when the material is only a construction of our own discourse? If ecocomposition critiques the discourse of an environmental policy, what is *actually* being critiqued? The discourse? Or the physical, material, organic entity in danger as a result of policy? The solution, as I understand it, is that if the understanding of the discourse is changed, then the new understanding will enact change in the material. However, this is an enlightenment view that many scholars criticize composition studies for installing in students. The understanding of the idea—that if the wrongs of the discourse are exposed we will seek to right the wrongs through action—does not always translate into action. Though the importance of discourse and language to understanding and giving meaning to the world cannot be denied,such a dependence on discourse risks losing sight of the material, physical world.

Dobrin and Weisser appear to be aware of this. They claim that "while discourse does indeed shape our human conceptions of the world around us, discourse itself arises from a biosphere that sustains life; while discourse 'creates' the world in the human mind, the biosphere physical environment is the origin of life (and consequently the human mind) itself" (Dobrin and Weisser 574). In a sense, they are correct in pointing out this connection or lineage that extends from the physical world to discourse. However, at the same time, this reasoning seems specious because, though the human mind is attributed to the physical environment, discourse is a creation of the mind and not the physical environment. Discourse is the lynch pin between humans and the physical environment, but a humanly constructed lynch pin. The authors claim that language arises from the world (574), and it does, though as a response or reaction to and with the world. Perhaps they intend a Barthonian understanding that language writes those who use it. If this assumption is true, in the context of ecocomposition (or other eco critical disciplines that focus on language and discourse), then what is the "language" that the

environment is using to “write” us? Is it the same language found in the discourse used to identify the “concept” of the environment that Dobrin and Weisser explain? If so, then it seems humans are writing themselves in a conceptual environment they determine. I do not think that it is this type of language, but rather a “language” based on the physical, material environment. This language cannot be entirely (if at all) discursive because human language is not pre-constructed by the physical world and then handed over to humans; language is a human construct or, at the very least, a construct of species. The reciprocal relationship between humans and nature must be based upon human discourse on the one side and the materiality of nature on the other. It cannot be based upon human discourse and the “human generated discourse” which defines environment. The point is that such a dependence on discourse underestimates a key point: environmental concerns are just as real with or without the discourse surrounding them.

In the article, Dobrin and Weisser lambaste ecocriticism for not moving beyond the literary text, stating that “activity of literary criticism […] does not effect change; activism does” (578). For Dobrin and Weisser, “encouraging students to be critical of the very environments in which they produce discourse and the effects those environments have upon their writing effects change […] reading Edward Abbey does not” (578). This is a contentious view that sets up a dispute between ecocritics and ecocompositionists when really both disciplines are arguing for the acknowledgment of place as a critical category. And, arguably, the acknowledgement of place in shaping thought and action (reflected here in writing) is a powerful start to understanding the connections between human and nonhuman.

In the end, these concerns probably loop back to the constraints I pointed out earlier. But, as I hope this dissertation project has indicated, there are some positive ways of broadening our connection to the material world that discourse and digital practices do a good job of facilitating. At the lowest level, whether inside or outside of the First Year Writing classroom, texts and discussions have material consequences and articulations. On one hand,

to be inspired by Abbey can have serious material consequences (I am focusing on the positive environmental ones). But, on the other hand, to read Abbey without situating the text within a material connection can have serious material constraints on its effects. In the Introduction, I discussed Mark Lynas' book, *High Tide,* as a blending of scientific study and public examples. Really, though founded in science, research, and expert testimony, Lynas' book is a narrative about one man's journey to understand climate change. Beginning with a photo of a glacier in the Peruvian Andes, Lynas sets of to "tell" a story about climate change. This story utilizes computer data, memory, photography, and personal experience to map the trajectory of climate change. While extravagant because Lynas travels all over the world—a fact students are quick to point out—the story is simple in its approach: talk about and record the effects of climate change with those who are living through it every day (and those who study it professionally). This approach is refreshing in that (financial constraints aside) anyone can do it. There is research involved in Lynas' account, but really (and this is not a negative critique) he is simply interacting with his world and opening himself up more broadly to the effects of climate change. This is an approach students can take (albeit on a much smaller scale). In this basic example, word and world materially connect to make a strong argument.

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