

Tracing Carbon Footprints:
Sensing with Metaphor in the Cultural Politics of Climate Change

by

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M.A. Carleton University, 2003
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of the Requirements for the Degree of

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Supervisory Committee

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The carbon footprint metaphor has achieved a ubiquitous presence in Anglo-North American public contexts since the turn of the millennium, yet this metaphor remains under-examined as a crucial mediator of political responses to climate change. While the assumption is that this metaphor orients people toward mitigation efforts that address this urgent crisis, close attention to its many figurations suggests a complex range of possible orientations. Using a discursive analysis of instances of this metaphor in popular and public texts, and mobilizing an interdisciplinary array of literatures including theories of metaphor, political theories of affect, and cultural politics of climate change, this dissertation asks: “what are the promises and risks of the carbon footprint metaphor?” Given the histories that have shaped the appearance of climate change as a public matter of concern to be governed, the carbon footprint metaphor in many instances risks marketized approaches, such as offsets which allow business-as-usual trajectories of worsening carbon emissions. Yet, certain other instances of this metaphor promise to disturb such approaches. The promising disturbances to marketized and instrumental approaches through this metaphor emerge as a result of larger-than-human actors who come to challenge given accounts of the footprint. In these instances, the carbon footprint metaphor suggests that dominant anthropocentric responses to climate change are inherently flawed because they miss out on wider political ecologies. Here, the metaphor itself as a suspension to the representational logic of (human) language offers a key political opening to actors not yet accounted for. For those seriously interested in tackling the climate change issue, critical attention to the risky and promising attachments of carbon footprint metaphors marks a key intervention.

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Dedication

To my parents, Deanne and Garry Girvan for the critical support in providing feedback on iterations of this dissertation, and for the love, care and devotion you provide to Reina and Kieran. Thank you especially, Mom, Dad and Allison for my childhood in the forest/farm on traditional Lheidli T'Enneh territory. This early formation enabled me to truly connect with what it means to live, struggle and celebrate among larger-than-human relations. My passionate attachment to these earthly relations largely informs the hopes I express in this project.

Introduction



Figure 1: An Image of a ‘Carbon Footprint’¹

Located through a Google search of carbon footprint images, the above figure situates the carbon footprint within a curious entanglement of narratives in the cultural politics of climate change. Featuring a feminized, ‘organic’, curvaceous footprint, coupled with a phallo-centric textual imperative toward bigness, this footprint suggestively inserts itself into the imaginary fabric of a humanity struggling to avert an urgent crisis of its own making, but still hopelessly seduced by its own procreative attributes. Although the carbon footprint has been conventionally and singularly understood as a challenge to fossil-fuel intensive life, close attention to its many figurations suggests more nuanced accounts. The figure above and the many other instances of carbon footprint metaphors intimate that since its historical emergence, the carbon footprint metaphor has traced this fine line, promising to bring human climate impacts into view so that they may be reduced, but also risking a reification of certain cultural preoccupations with, and legacies of, human ‘greatness’ that are themselves dependent on (hydro)carbon-intensive systems. In this dissertation, I trace the promises and risks of the carbon footprint metaphor,

suggesting that this metaphor is a powerful, yet under-examined mediator in the cultural politics of climate change.

The cultural politics of climate change involve “dynamic and contested spaces...where formal climate science, policy and politics operating at multiple scales permeate the spaces of the ‘everyday’” (Boykoff 2011, 3). Having both a scientific valence as a quantifying metric that finds itself in policy circles and a powerful popular cultural valence in its pervasive everyday uses, the carbon footprint metaphor has become what Raymond Williams would call a “keyword” [key metaphor] of our time (1985). Keywords, in Williams’ theorization are not key simply because they are popular or pervasive at any given time, but because their meanings are contested and these sites of contestation hold special significance and political urgency within a particular historical epoch. Bringing Williams’ notion of keywords into urgent matters of the twenty-first century means grasping the particular relationships between key *metaphors* and ecological politics that press upon and challenge political institutions and human ways of apprehending the world through language. To this end, I situate carbon footprint metaphors as critical sites of struggle over how to apprehend and respond to climate change as a complex matter of concern that is paradoxically human-initiated and yet always larger-than-human. As I describe in what follows, while poststructural sensibilities suggests that all language is metaphorical in its humanly world-*creating* rather than world-*representing* effects, the metaphor as a metaphor itself for “carry over” (from Greek) holds particular insights into these world-creating effects. Indeed, the “metaphorical turn” in a range of disciplines from cognitive linguistics (Lakoff and Johnson 1980) to health studies (Sontag 1978; 1989) to environmental science (Larson

2011) attests to a growing sensitivity to the privileged mediating role of metaphor in cultural and material relations and their world-creating effects. Despite such recent attention to metaphor, however, the carbon footprint metaphor *as a metaphor* remains consequentially under-appreciated and unexamined in its key figurations of climate change politics.

A vital sign of this metaphor's key valence is *The Pocket Idiot's Guide to Your Carbon Footprint's* assertion that "the size of your carbon footprint may become one of the most important numbers in your life in the twenty-first century" (Grant 2008, 3). Further, the Government of British Columbia offers its citizens "52 ways you can reduce your carbon footprint" in its Climate Action Plan, a document mandated to direct short and long-term climate change governance and policy directions within the province (2008).² The website carbonfootprint.com and its parent company, Carbon Footprint Ltd. claims to be the "first choice for businesses looking for carbon management consultancy services."³ And the Sony Playstation 3 game, *Trash Panic*, suggests two play styles: "eco-friendly", which features players disposing of garbage in biodegradable ways, and "ego-friendly", in which players "burn items and leave a carbon footprint."⁴ What is remarkable about these statements and the many other iterations of this metaphor, is the diversity of scales and interests expressed, ranging from the corporate player to the individual game consumer to policy-oriented provincial governance; indeed, this diversity reveals that *the* carbon footprint metaphor is not a singular expression of the will to reduce carbon emissions, but rather, a range of expressions, invested with varying interests, affects and agendas, not all of them biospherical.

While I have begun the critical narrative here with a particularly fraught and risky human footprint image that plays out on the level of the individual and is subject to poststructural critique in what follows, I also insist on featuring the promises of certain instances of the carbon footprint metaphor as they create openings for considering political actors that have not yet been accounted for. Some of these instances of ‘carbon footprints’ trace crucially important connections among globally-linked human populations and still others that significantly link humans and non-human actors through the associative work of yoking that is at the heart of metaphor’s functioning. The frivolous-seeming image above and the ambivalent story in which carbon footprint metaphors are implicated by no means render “neutral” the effects of these metaphors; on the contrary, their ambivalence and metaphorical shiftiness are at the very heart of their formidable mediating power. A great deal is at stake in understanding the political and ecological mediations of these metaphors.

The aim of this dissertation is neither to sift through carbon footprint metaphors to find the right one that will definitively produce the best outcomes in all contexts for climate change, nor to dismiss carbon footprint metaphors as fully complicit with fossil-fuel intensive life; rather, the goal is to situate this particular family of footprint metaphors as a uniquely captivating and catalyzing, but tension-ridden site in the cultural politics of climate change. Although the dominant tendency is to apprehend these footprints quantitatively, their qualitatively divergent paths and their notoriously shifty numbers require recognizing these metaphors not simply as numerical representations of ‘impacts’ but as constitutive of material worlds. My claim is that not all carbon footprint metaphors are built equally, nor do they mediate the same political and ecological

practices. By ‘charging’ carbon footprint metaphors as important sites of struggle, the political work of ecological metaphor emerges. Shifting the site of contest to metaphor serves not as a distraction from the ‘real,’ critical politics of climate change, but offers an extended exposition of the cultural spaces in which climate change is constituted and through which interventions must also take place.

The urgency of climate change requires, paradoxically, that we pause and think about the complex effects of these metaphors. Those footprint metaphors that are particularly revealing of relations between diverse humans and myriad non-humans most promisingly illustrate an opening for a politics of metaphors as what I call in Chapter One “affective mediators” of these relations; however, the mediations of the carbon footprint metaphor also risk closing off such potential by carrying over connections to self-referential dominant human systems and relations (especially carbon markets⁵) whose dominating logic may be at odds with the inclusion of alternative actors and approaches to climate change. Thus, tracing carbon footprints responds to a pressing need to attend to *how these metaphors matter* in a time of anthropogenic climate change.

My inquiry begins with two critical questions: 1) What are the promises and risks of carbon footprint metaphors as mediators of political responses to climate change? 2) How can an examination of carbon footprint metaphors generate understandings of the ways in which climate change and other ecological issues are at once culturally and materially constituted?

My approach to answering these questions involves situating carbon footprint metaphors within the context of climate change as a material *and cultural* phenomenon and examining specific instances of this metaphor in-depth. The bulk of the remainder of

this introduction is occupied with the question, *why/how metaphor?* If the power of the ‘carbon footprint’ emerges in large part out of its metaphoricity as I claim, then a survey of key metaphorical functions and effects from studies of metaphor helps to re-situate the carbon footprint within this under-recognized metaphorical play that contributes to its political and ecological composition of worlds. *Tracing Carbon Footprints*, then sets about two related tasks in two parts. In Part One (Chapters One and Two), I describe the historical contexts of the emerging politics of climate change and lay the theoretical groundwork for understanding carbon footprint metaphors as crucial mediators in these politics. To this end, Chapter One traces key cultural, ecological and political conditions out of which the carbon footprint emerged at the turn of the millennium as anthropogenic Climate Change became an urgent matter of public concern. Picking up on the insights of this story of emergence, in Chapter Two, I situate the carbon footprint metaphor as an “affective mediator” which connects various publics to the urgent issue and makes visible a variety of ambivalent political responses to climate change. This chapter involves elaborating the links between metaphor, politics and “affect.” The latter is a term that has taken hold in recent scholarship to attend to how the social, the somatic, and in some cases, the ecological are involved in the process of political sense-making as a moving set of force-relations and encounters that are often unaccounted for in ‘rational’ perspectives of politics (Ahmed 2004; Brennan 2004; Bennett 2010; Massumi 1995; Seigworth and Gregg 2010; Protevi 2009). This is not to centre instead on an “irrational,” emotionalized (and feminized) form of affective politics (against cognition), but rather to understand that “in practice...affect and cognition are never fully separable” and that a political actor’s relational “encounters with mixed forces” (where actors and forces are always

larger-than-human) make possible various kinds of political responses (Seigworth and Gregg 2010, 3-4). Seen through this lens, the carbon footprint as it shifts and attaches to various ‘bodies politic,’ makes possible a diverse and contesting range of responses to climate change.

Part Two gives evidence to these various mediations and ambivalent responses through three case studies in which the carbon footprint metaphor appears in Anglo-North American contexts around the turn of the twenty-first century. I discursively analyze these carbon footprint metaphors in public texts in order to explore the promises and the risks of the politics they enable. I trace the promises of the footprint metaphor in certain instances as a disruptive force that challenges the norms of anthropocentric, fossil fuel intensive and geopolitically asymmetrical relationships of power. By contrast, I trace the risks of carbon footprint metaphors as they serve to further authorize these existing anthropocentric and market-driven norms that constitute the urgent issue of climate change and keep global asymmetries in place. The wager of this dissertation is that becoming sensible to the mediations of this metaphor will, in the words of Jane Bennett, “encourage more intelligent and sustainable engagements” (2010, vii) with the lively larger-than-human forces and relations that are at stake in the urgent concerns of climate change.

The Paradoxes of Climate Change as Physical-Cultural Phenomenon

This exploration of the effects of carbon footprint metaphors begins by taking seriously Mike Hulme’s claim that “climate change is simultaneously a physical transformation and a cultural object” that requires transformative socio-cultural responses (Hulme 2008, 5). Far from spinning an esoteric tale that detracts from the important scientific work on

climate change, I claim that climate change must be understood at its origins to be cultural and political as well as physical or material in the scientific sense. Without the work of climate scientists, there would be no consensus in the world on climate change; however, the expectation that climate science alone can communicate “the facts” and singularly generate movement and solutions on this urgent issue has led to pitfalls in the politics of climate change. Paradoxically, western science’s own founding principles undermine its ability to generate the kinds of certainty demanded by a still-skeptical portion of the global public. Andrew Weaver highlights the principle of scientific uncertainty (of, among other things, emissions trajectories and complex climate interactions) that, when taken out of its context, risks enabling climate change deniers to make claims that climate change is unproven (2008, 24, 63-65). Because science conventionally operates with controls and re-producible experiments, the lack of a control planet similar to Earth and the inability to reproduce the ‘experiment’ of climate change presents deniers with a dubious but endlessly fertile ground for garnering support through confusion, misunderstanding, and manipulation of the very notion of scientific uncertainty. Attempts to establish indisputable facts – connecting particular weather events with climate change or predicting warming accurately, for example – are notoriously problematic. Max Boykoff also connects this phenomenon to the journalistic norm of “balanced reporting” – a logic that often amounts to representations of two sides of the climate change story in the media as if there were still a 50-50 split in climate change belief among scientists and the general public, despite the widespread consensus that exists (2011, 108-109). Such impediments forestall the kinds of questions and discussions that catalyze political movement on the issue of climate change. With Bruno

Latour, I therefore posit climate change neither as a matter of fact, nor as a matter of values that are singularly socially constructed, but as a “matter of concern” (Latour 2004, 96) that inextricably entangles facts and values, biophysical processes and social constructions. One may rightfully claim that climate change is a “matter of fact,” but what it means, for whom, and what should be done about it immediately brings one into the messy realm of values, culture, and politics. This dissertation thus pitches its intervention at the cultural politics of climate change, where shifting and contested “everyday” public cultural spaces like those surrounding the carbon footprint, profoundly bear upon political responses. I acknowledge that these politics are both caught up in discourses that are socially constructed *and* situated within a world that is larger than these human constructions. Climate change itself - and responses to it, including the carbon footprint metaphor - are fully entangled in what Donna Haraway calls “naturecultures,” bundled collections of histories, ecologies, and imaginaries (2004, 1-2). While putting nature and culture together in one word might not resolve an existing problematic binary, this assemblage at least permits two terms – from which there seem to be no easy exits in western epistemology despite on-going valiant efforts – to be thought together, if in paradoxical ways. Climate change and specifically, my analysis of carbon footprint metaphors, requires engaging with this central paradox, and other attendant paradoxes, that are evident throughout the dissertation.

Humans (and culture) are undeniably a part of what is signalled by “nature,” but as the notion/metaphor of the “Anthropocene” (Crutzen 2002) paradoxically attests, there is something about a *human species force* that is conceptually and politically important to recognize, even for postcolonial scholars who are critical of the historical violence that

has taken place through the work of universalizing biological taxonomies of species (Chakrabarty 2009). Anthropogenic climate change and the associated metaphor of the anthropocene name the contemporary epoch as one in which the human species has achieved planetary forms of disruptive agency; thus, such phenomena centrally figure ‘human’ effects and responsibilities. However, such human-induced phenomena also simultaneously and paradoxically displace the logic of the centrality of humans as master agents. Such a logic of mastery has, as commentators attest, not only in part generated the urgent problem of climate change, but it might also further exacerbate socio-ecological issues through proposed solutions that also suffer from delusions of mastery, as do some climate engineering schemes (Hulme 2014). Anthropogenic climate change thus might suggest that we read effects not simply as linear outcomes or “symptoms” of the impacts of a singular human-species agent, but rather in a more complex entanglement, where humans might indeed be seen as exerting the strongest force as a species, but not as singular intentional agents acting in isolation. This is not to absolve (certain) humans of their responsibility for climate change effects, but to locate human forces within a larger-than-human set of relations that must be kept in close proximity in ‘our’ ways of knowing about and responding to climate change. The Anthropocene is another metaphor that requires treatment beyond the confines of this research, but as a figure that might orient “a way of being in the world that recognizes our simultaneous power and vulnerability” (Mikaluk 2013), its paradoxes underlie the cultural politics of climate change in which the carbon footprint metaphor is embroiled. Part of the aim of this research, then, is to explore whether the carbon footprint metaphor is a figure that enables the recognition of

the *simultaneous power and vulnerability of humans (and others)* through the participation of both human and non-human actors.

Relatedly, even as climate change denotes a planetary concern that requires thinking in terms of planetary scales of humanity and larger-than-human collectives, such scales can also be problematically universalizing in their failure to address key differences in terms of unequal power relations, responsibilities and felt impacts of climate change. This linguistic and conceptual conundrum appears in my provisional use of the subject position ‘we.’ I occasionally use ‘we’ in this text to refer to a global collective that is affecting and affected by climate change even as I unpack the hidden asymmetries within this term. As Cary Wolfe enigmatically suggests with regard to climate change “there is no ‘we’, yet there is nothing but ‘we’” (Wolfe 2011, personal communication). For a posthumanities/animal studies scholar to make such a statement reveals a certain need to keep the universal/global *and* the particular/local in play, as mutually-troubling categories.

While the paradoxes mentioned above are more explicitly cited by a number of scholars thinking along such naturalculture axes (Borgman 1995; Cronon 1996; Haraway 1988; 2004; Hayles 1995), perhaps the one that is the most contentious in terms of ecological politics, one on which my dissertation pivotally turns, is the paradox of metaphor. Metaphor might be considered a unit of “discourse” which is, on the one hand, socially (humanly) constructed. A key poststructuralist contribution to science studies and political ecology has been its insistence that the scientific ways in which “we” come to know and talk about the “natural” world and ecological issues like climate change are heavily mediated by language and cultural assumptions that are far from universally

objective (Cronon 1996; Escobar 1998, 1999; Haraway 2004; Hayles 1995; Kuhn 1962; Latour 2004; Mortimer-Sandilands 2010).⁶ Despite being cast in many spaces as scientific metrics, carbon footprint metaphors and the variety of agendas they come to support are exemplary of the various discursive effects that consequentially shape approaches to climate change. We must take seriously poststructuralist warnings about the effects of discourse, especially positivist accounts of the world that fail to reflect on the how “the idea of nature contains, though often unnoticed, an extraordinary amount of human history” (Williams 1980, 67). And yet, “this is not to say that the nonhuman world is somehow unreal or a mere figment of our imaginations – far from it” (Cronon 1996, 25).

Informed by those who think within the interstices of these paradoxes of natureculture and by my observations of carbon footprint metaphors, I attempt to keep these paradoxes open. For thinking simultaneously about carbon footprints as metaphors *and* about climate change as a pressing issue suggests that just as human societies construct “nature” as *trope* with words and practices, these societies also construct and manipulate “nature” as *topos* or “commonplace” that is shared and co-constituted with non-human actors (Haraway 2004, 65-66).⁷ Further, one must find ways of making room for forms of non-human agency – what Jane Bennett calls “vibrant materiality” (2010) – ways that even as they are inescapably mediated by human discourse, partially and contingently index a larger-than-human world of relations and processes. Ecological metaphors (described below) such as “carbon footprints” offer the promise of accounting for these connections⁸ and thus, disturbing anthropocentric approaches to climate change; however, as a critical approach to discourses reveals, these metaphors also risk reifying

the very anthropocentric cultural practices – fossil fuel resource extraction, consumer habits of privileged subjects, and market growth – that are central to the problem of climate change.

As studies of metaphor attest, metaphors and discourses do shape worlds (Radman 1997); however, my own approach to the question of (ecological) metaphor gleaned from studying carbon footprints, is paradoxically both to understand this human world-making function of metaphors and also *to explore these metaphors as potential traces of worldly others that exceed humans in all their diverse and contested forms*. In other words, rather than illustrating that *human*-made metaphors unilaterally make the world, I am also interested in the ways in which ecological metaphors also potentially communicate the agency of larger-than-human actors who come to challenge a given human way of constructing the world.

While, as William Cronon notes, it is easy to make caricatures of one's adversaries along a nature-culture divide in high-stakes environmental politics, it might be rather more productive to step tentatively forward grappling with the paradoxes of *natureculture* as part of the "human project of living on the earth in a responsible way" (Cronon 1996, 22). As one who has simultaneous passionate attachments to: an on-going planetary human community rich with internal diversity and aspiring to achieve more equitable relational encounters; biodiverse companion species that condition local and planetary communities and who exist not only for/in the service of humans; and the play of language and metaphor, I embark on an extended exploration of the possibilities and foreclosures of this particularly potent metaphor. I humbly ask that the reader think of the

tensions that I identify above as paradoxes rather than contradictions. For Donna

Haraway, feminist scholar of science *and* poststructuralist, the challenge is:

...how to have simultaneously an account of radical historical contingency for all knowledge claims and knowing subjects, a critical practice for recognizing our own "semiotic technologies" for making meanings, and a no-nonsense commitment to faithful accounts of a "real" world, one that can be partially shared and that is friendly to earthwide projects of finite freedom, adequate material abundance, modest meaning in suffering, and limited happiness. (1988, 579)

This is no straightforward task, but it is within these paradoxes that I situate my study of carbon footprint metaphors as one crucial site in which contingent knowledge claims, meaning-making and the 'real' world interact. The cultural politics of climate change are embroiled in ongoing debates about nature and culture that turn on complex issues that will not be resolved by any intervention of mine; however, tracing carbon footprint metaphors will help to animate and situate these tensions in particular ways that serve to centre the metaphor's promising (and risky) potential to intervene.

Why (and how) Metaphor?

My approach to 'carbon footprints' begins by identifying them explicitly as metaphors and by understanding their effects as derived, in large part, by their very metaphoricity.

While metaphors have conventionally been conceived as frill, extraneous to signification 'proper,' they occupy a more central and everyday place in creating ways of knowing about the world and in shaping worlds themselves. I begin here with an initial contingent working concept of metaphors which will be fleshed out throughout the dissertation through the particular cases of carbon footprint metaphors I study. Of the two approaches to metaphor identified by Dennis Sobolev within studies of metaphor – 1) identifying structures of metaphor and 2) exploring functions (2008, 905-906) – my own project

falls into the latter agenda. That is, rather than sealing metaphor in a tight definitional construct in order to say what metaphor definitively is, my purpose for this study is to theorize how one particular metaphor – the carbon footprint, itself a multiplicity – produces effects, and to begin to understand some of these effects (and affects). To understand how it produces these effects, however, one cannot completely avoid drawing attention to *what* may be identified as metaphor.

With Sobolev (2008), Ricouer (1977) (and even going back to Aristotle⁹), I contend that metaphors are formally identifiable when considered explicitly through some relationship of resemblance - either pre-existing or created within the metaphor itself – that highlights certain attributes of a given entity when seen through another. Through this poetic function, “carbon footprints” thereby index greenhouse gases (another metaphor) as climate *impacts* (yet another metaphor) when seen through the footprint as a marker of an impact or impression. The above loose definition of metaphor, however, instantly produces other necessary conditions like ‘difference’ since the entities being drawn together must also be somehow dissimilar for metaphors to work; such absent terms and tensions are central to the effects of metaphor which works by connecting together unlikely things. This is a central feature of the functioning of carbon footprint metaphors: its effects are generated in part, by the yoking of unlikely things. *How is it that carbon and footprint get yoked together, despite their un-likeness?* I will explore this question more thoroughly in Chapter Three, but for now, I identify the general feature of yoking that situates carbon footprint metaphors within a “politics of aesthetics” (Rancière 2004) in which metaphors fundamentally help to constitute worlds,

rather than simply describing things in a poetics that is conceived as devoid of political (and ecological, in my theorization) importance.

Aesthetics for Jacques Rancière is not limited to the domain of art but rather, refers more generally *and politically* to the organization of “material arrangements of signs and images, between what is seen and what is said, between what is done and what can be done” (2004, 39). In other words, reflecting on aesthetics reminds us of the ways in which ‘composition’ takes place in politics through words [metaphors], and what they bring into visibility which shapes the actions that flow from such arrangements. While metaphors have long been recognized for their forceful power in the literary arts, this force has not conventionally been cast as political. Although Rancière does not explicitly focus on metaphors in his politics of aesthetics, he outlines a connection between political statements and “literary locutions,” which describes a crucial relationship between politics and metaphor:

Political statements and literary locutions produce effects in reality. They define models of speech or action but also regimes of sensible intensity. They draft maps of the visible, trajectories between the visible and the sayable, relationships between modes of being, modes of saying, and modes of doing and making. They define variations of sensible intensities, perceptions and the abilities of bodies. (2004, 39)

As my analysis of carbon footprint metaphors brings to light, these metaphors produce effects through prescribing roles and models for speaking and acting in the cultural politics of climate change. Each of these metaphors provides a range of possibilities (and forecloses upon others) in ways that profoundly shape politics and ecologies, but these ways are usually overlooked because of the everyday quality of metaphors. I will further develop this politics of aesthetics of carbon footprints through Rancière’s key notion of “distribution of the sensible” in describing my approach to analysis in Chapter Two; my

intention here is to situate metaphors as profoundly political in their aesthetic acts of yoking.

A politics of aesthetics of metaphors compels understanding metaphors not as exceptionally-used language against “proper” language (as do Aristotle and certain other ‘Fathers’ whose canonical political texts are based on Aristotle’s legacy¹⁰), but as everyday mediators that are pervasive, inescapable and bundled up with ways of knowing about the world that in turn shape the world (Chilton 1996; Lakoff and Johnson 1980). Many of the hundreds of metaphors that we use each day are not recognized as such simply because they have been conventionalized.¹¹ There is simply no way in which to communicate literally in both everyday life and even within scientific disciplines, that is, without the use of metaphors. Like many metaphors that are popularized in everyday cultural spaces such as the media, the carbon footprint metaphor has become naturalized as a ‘representational’ concept to account for emissions impacts. This conventionalization, however, does not entirely deprive the carbon footprint of its metaphoric power; on the contrary, as I will show in my analysis, it, or rather *they*, continue to yoke together unlikely things and generate consequential cultural practices, without explicitly drawing attention as metaphors. Metaphors can thereby covertly generate equivalencies where none previously existed. This means that the associations generated also risk becoming conventionalized and closed off as practice, against the promising openings that these metaphors may afford.

Paradoxically, what makes metaphors *seem* exceptional is that in their emergence (and as they yoke together unlikely things), they can effect a kind of disruption to the order of what is assumed to be the normal function of language. As Paul Ricoeur

suggests, metaphors involve suspending or altering ‘reality’ such that the whole referential function of language is marked by ambiguity (1977, 224). In resolving the tensions involved with a temporary dissonance between two unlike entities in order to make sense of a metaphor, new relational orders are created. This is what Radman calls the “world-making” function of metaphors. What is more, as Denis Sobolev (2008, 917) suggests, metaphors emerge in response to a “semantic gap”, where no language exists to respond to a given set of circumstances. This is one of the key functions of carbon footprint metaphors as I describe in Chapter Two; they emerge alongside novel understandings of climate change in the gap of: *now that we know about it, what are we to do?*

As my analysis reveals, how these metaphors respond to this gap depends on the different instances of the metaphor and the different sets of associations and cultural practices yoked within it. Different worldly possibilities are enabled by different instances since metaphors are shifty mediators. As Paul de Man insists, “... not only are tropes, as their name implies always on the move – more like quicksilver than like flowers or butterflies which one can at least hope to pin down and insert into a neat taxonomy – but they can disappear altogether or at least appear to disappear” (1978, 18). In these moments of appearance of disappearance, metaphor’s world-making function is obscured from view. The various carbon footprint metaphors I analyze exemplify this movement of tropes in different times and space, and how they often “appear to disappear” as metaphors. In the many examples of carbon footprint metaphors in discourses that I have tracked, very few mention the carbon footprint as a metaphor at all (Brainard 2008; Berners-Lee 2011; Nerlich 2011). Those that do mention the

metaphorical aspect of the carbon footprint, generally do so only in passing and then move on to what the carbon footprint definitively measures or *means* (Berners Lee 201 1, 5-8). A certain quantitative authority is granted to the carbon footprint when the explanation does not recognize its metaphoricity, but makes claims such as “Carbon footprint *sums up* the impact of human activities...” (Grant 2008, 4) or “A carbon footprint *is the amount* of carbon dioxide...” (Yarrow 2008, 6) (emphasis added). The power of some of the effects of the carbon footprint metaphor derives from this disappearance of appearance of metaphor. Rather than making a claim to neuter these powerful effects by re-exposing its metaphoricity, my goal is to re-charge the carbon footprint explicitly as a metaphor and thereby re-assert its power as a shifty mediator in the cultural politics of climate change. I argue that much of the promise of this metaphor relies on novel understandings of metaphors and explicit recognition of what they might offer in these cultural politics by creating openings for unaccounted human and non-human actors to appear.

The carbon footprint metaphor’s shifting mediations in these politics reveal the final key function of metaphor, suggested in the work of Susan Petrilli. She offers metaphor, in its constant movement, as an ethical or political opening to “the other:”

Metaphorization is a movement of perpetual displacement that leads sense outside the sphere of the common place, of plain meaning. The metaphorical dimension of signifying processes evidences that meaning is not something that can be grasped for once and for all, but is a question of opening to the otherness of sense, to the logic that animates it. (2006, 77)

By shifting from meaning or representation to “sense,” Petrilli highlights the contingency of understandings through language that may be taken as commonplace. Metaphor, from this perspective, reveals sense-making as an on-going dialogic process that features

relational encounters and processes that shift through these encounters. Definitive meaning is not grasped, but explicitly deferred through metaphor. As Marshall McLuhan's evocative twist on a line of Robert Browning poetry suggests: "a man's [sic] reach must exceed his grasp or what's a metaphor?" (1964, 7).¹² *If recognized for their metaphoricality*, carbon footprint metaphors do offer this potential of opening out to otherness in a way that troubles a fixed (and human-centric) account of stable, knowable entities that can be named and managed for once and for all. "Tropes swerve, they defer the literal, forever, if we are lucky; they make plain that to make sense we must always be ready to trip" (Haraway 2004, 2). I will explore the carbon footprint metaphor's promise in its ability to "trip up" given human, managerial, market-oriented norms through fostering humbling connections with larger-than-human relations and process. I will also supplement this promising angle on metaphors with the critical perspective of Rancière's "distribution of the sensible" (2004), which attends to the risks of certain agendas in which carbon footprints reinforce the norms of a given order of the world, rather than challenge it by allowing new actors to appear.

To sum up a provisional working definition of metaphor from the contours outlined above: Metaphors function pervasively in everyday spaces by yoking together unlikely things in circumstances where existing language fails; they thereby create worlds that may shift in different instances. Because new metaphors emerge in a semantic gap, they offer the promise of bringing new entities or sensibilities into view, but because they are "shifty," and situated within wider discourses as cultural practices, metaphors also carry risks of reinforcing problematic exclusions (Rancière). These are the features of metaphor's functioning that I have chosen to highlight from extant literature on

metaphors because these features relate specifically to carbon footprint metaphors. While I provisionally propose that these features may be extended to other “ecological metaphors” (described below), I have not analyzed a wide enough set of metaphors to generalize beyond the carbon footprint metaphors that I take up in this dissertation.

‘Ecological’ Metaphor

While some recent theories of metaphor have formatively centred the importance of *social* context in understanding how metaphors achieve meaning and how metaphors and society recursively shape each other (Chilton 1996; Sontag 1978; 1989), there has been limited explicit work to date on the recursive relations between metaphor and the larger-than-human world.¹³ Although there has been no shortage of ecological metaphors circulating in dominant societies in the last few decades – “population bomb” (Ehrlich 1968/1997), “tragedy of the commons” (Hardin 1968), “silent spring” (Carson 1962), “Earth in the balance” (Gore 1992) to name a few – these have received little scholarly attention *as metaphors*, nor has metaphor attained a place of importance within political ecology. One exception is found in the work of Richard A. Underwood, who explicitly identified metaphor as a site of ecological intervention in 1970 when he stated, “the ecological crisis is one primarily and fundamentally of metaphor...the resolution of the ecological crisis depends, then, upon the extent to which life-giving metaphors can be restored to our communal life.” (1970, 154) While Underwood’s imperative may seem simplistic in its quest to “restore life-giving metaphors” without clear elaboration of what that might mean, he did hint at a crucial agenda for metaphorical interventions and socio-ecological change on a metaphorical level that has rarely been taken up to date.

A second notable exception to the marginalization of metaphor in ecological scholarship is environmental scientist Brendan Larson's *Metaphors for Environmental Sustainability* (2011). In this highly elaborated work, Larson examines a series of what he calls "feedback metaphors," that is, "scientific metaphors that harbour social values and circulate back into society to bolster those very values." (22) He targets the feedback metaphors of "progress", "competition", "barcoding" and "meltdown" in each chapter to demonstrate how each determines a certain approach to the material-ecological world as well as the practices that spring from proposed solutions to environmental crises. In his chapter on barcoding as scientific taxonomizing of species, Larson demonstrates how metaphor, technology (emerging hand-held devices that barcode 'life' in the name of biodiversity conservation) and material practices converge to reify a consumerist approach to biodiversity where "the solution to a problem lies in a product" (139). "Thus the metaphor is not just rhetorical embellishment: instead it drives a particular vision of the world and how it should be. The metaphor is not just language but an encouragement to people to act on the world in a certain way and to develop certain capacities rather than others" (138). The question driving Larson's analysis is "whether the metaphors we use in environmental science nurture sustainability" (96).

My own approach to metaphors is sympathetic with Larson's perspective on metaphors as potentially "driving particular visions of the world" and enabling certain capacities while disabling others, but my analysis differs from Larson's in four important ways. First, my focus is mostly on the popular everyday discourses and uses of carbon footprint metaphors as well as some policy-oriented discourses,¹⁴ rather than on their uses specifically in environmental science. Although carbon footprint metaphors are

connected to a scientific approach aimed at quantifying emissions, they stray so far from scientific discourses and appear in such a wide array of popular discourses and public contexts (unlike, for example the DNA barcoding metaphor and practice enacted by environmental scientists as identified by Larson¹⁵) that apprehending them as partly ‘cultural’ in their origins is necessary. Second, rather than proposing a group of four feedback metaphors (progress, competition, meltdown and bar-coding) that shape all the other metaphors that follow, as Larson does, I explore the effects of one metaphor – the carbon footprint – that reveals itself to be a tense family of plural metaphors. This extended treatment allows carbon footprint metaphors themselves in their shifting emergent appearances to lead the directions I take in my analysis. Although I do come to some similar conclusions as Larson about how carbon footprint metaphors risk securing marketized approaches to the environment, carbon footprint metaphors themselves have surprised me in their shifting accounts of larger-than-human relations and processes that matter (as I describe in Chapter Five). As Lawrence Buell suggests, the nonhuman environment has often been perceived as a context or a “framing device” of human activities and artefacts, but “...human artefacts [themselves]...bear traces” of non-human agencies (2005, 25).

Attunement to these traces and active presences requires reading and sensing with metaphors differently, actively seeking out the traces of non-human agency even though (especially because) such traces offer no stable ground. In other words, carbon footprint metaphors reveal that one must be cautious of positing metaphorical feedback loops that can always be reified in human terms, for these may not present the whole story. Importantly, neither does *this* analysis of carbon footprints claim to represent the whole

story; rather it illustrates that when metaphors are recognized as bearing larger-than-human traces, these metaphors expressly reveal a flawed partiality of understanding in attempting to grasp and represent the whole story in dominant human terms. As Donna Haraway reminds, our understandings are always based on “situated knowledges” that can only ever be partial perspectives (1988). This explicit and sustained understanding of partial perspectives enabled by metaphors thereby opens up to a potentially more inclusive worldly politics. Once again, however, one must be attentive to the metaphorically shifty figure of “carbon” whose footprints may always turn other-ward.

Such shiftiness leads to the third point of divergence from Larson’s work. Whereas the title of his book, “*Metaphors for Environmental Sustainability*” asserts an agenda for finding the ‘right’ metaphors, this study of carbon footprints suggests that their very metaphoricity allows them to shift in a variety of contexts for a variety of agendas such that one cannot render a verdict in all cases as to whether *the* carbon footprint metaphor is *for* or *against* ‘sustainability’ (a notion that, in itself, is notoriously metaphorically shifty). Metaphors are as ecologically responsive as their specific practices, and attachments, permit. As this story of carbon footprints illustrates, in a world as populous and as complex as this, with multiple cultures, discourses and ecological actors, it is not simply a singular instrumentally-conceived metaphor itself that does this work; rather it is through the lively, shifting interactions and associations that are carried over by ecological metaphor that political and material effects take hold. These practices and orientations enabled through specific metaphors in specific contexts are what bear attention.

While I am aware that ecology itself is a contested and evolving term that may be used metaphorically to describe relations in corporations, organizations and networks of all kinds, I am using the notion *ecological metaphor* to highlight the kind of metaphor that explicitly orients thoughts, feelings, attachments and actions vis-à-vis the living world conceived not solely in human terms.¹⁶ This is to again insist that while the way “we” come to know and express the world is certainly mediated by human language, non-human actors exert influence on the need for linguistic and metaphoric innovation and intervention in cultural and material contexts. The emergence of ecological metaphors (and the ways in which these shift after their initial emergence) is related to historical and material-ecological conditions that demand novel accounts. It is in the form of precipitating ‘semantic gaps’ that non-human actors or forces might appear in human discourse. How these actors appear in language is subject to cultural conditioning, but I would like to suggest that humans might not be the sole authors of metaphor if one concedes that metaphors also arise out of ecological conditions; thus metaphors might be thought of as both culturally *and ecologically* conditioned. In fact, my purpose for using this term is to explicitly highlight that *ecological* metaphors are utterly emblematic of entangled relations of “nature” and “culture” in the Anthropocene. The ecological metaphor “invasive species,” for example, no doubt carries over a socially-constructed human military logic that bears scrutiny (Larson 2011). Its emergence, however, signals an ecological interaction that both exceeds the human by suggesting a certain intrusion into an order (or perception of order) and paradoxically, centrally implicates the human (colonial) author of this problem as one who introduces new species into geo-climatic regions where these “invasive” species spread at the expense of “native” species (another

metaphor). It is certainly imperative, as Larson insists, to debate whether the invasive species metaphor and its associated xenophobic practices of “advocating with fear” are the appropriate responses to this phenomenon (2011, 161);¹⁷ however, the point that any ecological metaphor emerges at all (however faulty and subject to critique) to figure this process reveals an active presence of non-humans as an impingement upon given human accounts. Ecological metaphors like the carbon footprint, similarly introduce a host of interacting entities, both human and non-human, that require novel accounts at this historical juncture. These metaphors are not deterministic representational accounts of “objective nature” and thus, they bear scrutiny, but as my analysis demonstrates, neither can they be said to be entirely human constructs, which makes them unique mediators of entangled larger-than-human relations.

While Brendan Larson uses the term “environmental metaphors,” I choose the term ecological metaphor for three reasons. First, ecology is more available to implicate humans *within* the term than is environment, which at times suggests “setting” or backdrop to human activity.¹⁸ Second, ecology seems to resonate with a certain “aliveness” and relationality between species in a way that environment does not, as environment is often conceived as a kind of inert, stable space.¹⁹ Third, and most crucially, in keeping with the Rancièrian-influenced analysis that follows, the term ecology itself implicitly connotes a space for making visible certain actors who have not yet been accounted for, but who are relationally important. A given ecology as a network of humanly-recognizable relations may, at times, be ‘policed’ by ecologists or land managers who attempt to define its contours as bioregions, or national parks. These practices, however well-intentioned, seem always ambivalently marked by particular

lively relations that do not follow such managerial logics. While these managerial practices of ecology bear scrutiny, however, I contend that the notion of ecology still has the potential to focus attention on “the part that has no part” (Rancière) in an anticipation of actors that exceed the givens of a particular ecological configuration.²⁰

Ecological metaphors – those that bear traces of non-humans and that consequentially orient, dis-orient and re-orient thoughts, feelings, attachments and actions vis-à-vis the larger-than-human world – particularly bear scrutiny for their worldly effects. Given the unprecedented pace of ecological change at the turn of the millennium,²¹ metaphors that trace naturalcultural relations must be recognized as crucial figures. As a particularly potent and timely ecological metaphor, the carbon footprint metaphor makes certain relations visible and outlines “sensible” contours through which to think, feel and act in relation to the politics of climate change, thus it is intimately bound up with an aesthetics of worldly politics. The associative work of metaphor carries over effects that are not only poetic and semantic, but also political and biospherical.

A final important contribution to the linguistic study of “carbon” discourses in Climate Change politics is Nelya Koteyko and Brigitte Nerlich’s work on “carbon compounds” (Koteyko 2010; 2012; Nerlich 2012). Using the tools of “corpora linguistics,” a computer-assisted method of collecting and tracking instances of words in texts to derive abstract rules by which language functions, these scholars track carbon “compounds” conceived linguistically rather than chemically. Koteyko and Nerlich’s studies offer an explicit engagement with the public spaces in which these novel carbon compounds occur as profoundly important sites of politics:

Carbon compounds in this lexical sense, seem to have overtaken ‘eco-compounds’ in popularity, that is words which use *eco-* as a prefix to signal

various environmental concerns and issues. A whole new language is evolving using carbon as a hub, which needs to be monitored and investigated in order to discover how climate change and climate change mitigation are framed... (Nerlich 2012, 32)

The forceful emergence of proliferating carbon compounds constitutes a whole new language (and consciousness), but as these scholars point out, these terms have been adopted without extended critical reflection on how political representations are “achieved with the help of which lexical means” (Koteyko 2012, 25).

In the first of her studies, Koteyko tracks the emergence of carbon compounds in the 1990’s and beyond, concentrating on on-line blog posts as sites of non-expert public conversations that shape cultural politics. In the year 2007, Koteyko finds 79 carbon compounds in use; perhaps unsurprisingly, in this, the year that the *Oxford English Dictionary* names carbon footprint “word of the year,” this metaphor is one of the top two most commonly appearing compounds, following “carbon emissions” (2010).

In a follow-up study, Koteyko analyses how dominant marketplace solutions to climate change are “discursively enabled and sustained through the use of so-called ‘carbon compounds’ ” (2012, 25). Koteyko describes how in the lead-up and follow-through of the Kyoto Protocol, multinational corporations advancing business oriented solutions to climate change created the conditions for certain market-oriented carbon compounds, like ‘carbon trading’ to dominate. These “political developments have shifted the focus from the science behind global warming and whether carbon emission could and should be reduced, to who will be doing it and through which economic frameworks” (ibid., 26). As I describe in Chapter One, the emergence of certain attachments between carbon and markets is commensurate with the creation in the 1990s of what Steven Bernstein calls “the compromise of liberal environmentalism” which

promotes “liberalization in trade and finance as consistent with (even necessary for) global environmental protection” (2000, 474). As my case studies reveal, the carbon footprint metaphor is entangled within these risky relations of carbon compounds.

Koteyko suggests:

[t]he first carbon compounds to emerge in the English speaking news, such as carbon trading and carbon credits were part of this shift to market-led climate change mitigation. Corporate support for climate measures became evident in the wave of activities and initiatives to manage emissions through product and process improvements, and the exploration of new market opportunities offered by carbon trading as well as by voluntary offsetting schemes. (Koteyko 2012, 26)

Similarly, in her article “‘Low carbon’ Metals, Markets and Metaphor: The Creation of Economic Expectations about Climate Change” (2012), Nerlich offers an extended analysis through corpus linguistics of how the lexical compound of ‘low carbon’ gained prominence in cultural discourses of climate change over time. While ‘low carbon’ was formerly used in specific fields with reference to low-carbon steel in manufacturing, it gradually came to take on salience in public climate change discourse in the 1990s when climate change was beginning to enter public consciousness: “...low carbon has acquired new meanings, from signifying quite concretely, the low carbon content of a certain metal to signifying, still relatively concretely, a minimal amount of greenhouse gas emissions, to signifying more abstractly and metaphorically, various (market-based) solutions to climate change” (2012, 38). The discourses of economic benefits and opportunities of ‘low carbon,’ especially in terms of competitive advantage of developing “low carbon technologies,” have particularly taken hold according to Nerlich’s analysis (ibid., 40).

These studies offer indispensable attention to carbon compounds in the cultural politics of climate change, especially insofar as they identify the risky associations that come to plague carbon compounds. I do, however, differ in orientation in my own focus on carbon footprint metaphors. Koteyko and Nerlich's approach begins with an important quantitative account of the frequency of certain carbon compounds in their historical emergence and elaborates a taxonomy of these lexical carbon compounds as framing devices as they occur in the media. Rather than counting carbon footprint metaphors and pinning them down as specific framing devices, my approach is to analyze carbon footprint metaphors in their heterogeneous instances, and to locate the metaphorical struggles across these instances as pressing theoretical and practical work in the cultural politics of climate change. I do so by describing these metaphors as "affective mediators" (elaborated in Chapter Two) rather than "frames," which metaphorically suggests a more static version of how these compounds might operate. Nonetheless, I find Koteyko's use of "carbon compound" useful. With its doubled valence in chemistry and language, the notion of compound facilitates an understanding of how carbon binds with other elements in multiple material and cultural contexts. I will further draw out this polyvalence of carbon in Chapter Two.

Some extant metaphorical compounds – *carbon market*, *carbon guilt*, *blue carbon* – will be elaborated in this dissertation as they are co-figured with carbon footprint metaphors. Throughout the analysis, I also propose new critical carbon compounds, including "carbon citizenship" and "carbon vitality," as these offer a lens into the kinds of politics that become associated with the carbon footprint metaphors that I analyze. Crucially, I do not claim the carbon compounds that I propose are 'essential' or any more

legitimate than others; I, too am mobilizing carbon's tropism as a figure to bring into visibility certain critical associations in the cultural politics of climate change. One of my goals then, is to trace the possibilities of carbon bonding with more radical political and ecological entities and processes (especially by suggesting the metaphor of 'carbon vitality' in Chapter Five).

Caveat:

A study like this may be susceptible to the pitfalls of its own overly conscientious attention to metaphors whose important work is foundational, but paradoxically, must be forgotten in order to move through texts and create contingently stable meanings. One cannot avoid metaphorical language in describing metaphors, and each one may entail many other relationships worthy of critique. The proposition of opening up all the potentially-contentious metaphors along the way in this text would be like endlessly "peeling an onion" (another figure!). I will therefore, consciously attend to the carbon footprint metaphor and open up certain other terms as metaphors along the way, but I will inevitably myself depend on many metaphors that are not critically unpacked throughout this dissertation.²² Ultimately, it will be impossible and undesirable to avoid this predicament in a text that must move in a somewhat linear fashion, so I will inevitably end up "tripping on tropes" (Haraway, 2004), both intentionally and at times, unintentionally; this too, however, will offer a generative dialogic encounter if it facilitates attention to how language is reciprocally implicated in world-making, (inescapably, in my own text).

PART ONE

Chapter One: Public Apprehension of Climate Change through Science, Politics and Affect

The ways in which climate change has become visible as an urgent planetary issue at the turn of the millennium have profoundly conditioned the emergence of the carbon footprint metaphor as a linguistic mediator of entangled naturalcultural relations. From its origins in a seemingly curiosity-driven science that did not gain wide traction in public spaces, the idea of *anthropogenic* climate change took a more forcefully and explicitly political turn in the late 1980's. While global political institutions began to arise to address the issue, a key challenge in the emergence of climate change as a pressing issue has been how to explicitly connect the universalizing abstract narrative of climate change to the particular bodies and processes (be they material, semiotic, individual, national, ecological) that constitute the phenomenon. At the turn of the millennium, the carbon footprint metaphor appears as a timely figure to respond to this challenge but as the narrative below suggests, it retains the tensions of the conditions of its emergence. This chapter presents a narrative of these conditions of the public apprehension of climate change as a *chronology with interruptions*. I call my narrative a chronology with interruptions because I am, in part, building on existing narratives of how climate change emerged as a public concern (Boykoff 2011; DiMento and Doughman 2007; Hulme 2009; Oreskes 2007; Weart 2007, 2014; Weaver 2008), but I am also pausing on key dates and texts which particularly reveal the tension-riddled *politics of affect* in which the carbon footprint metaphor is involved. As the following narrative reveals, publicly apprehending climate change has had much to do with how it is experienced affectively as a "certain kind of relationality...of the discursive and the material" (Grossberg 2010,

314). Just as scientists were identifying and speaking about this urgent matter of concern in the public and political institutions were emerging to manage carbon, a host of other visceral relational and material encounters – including ‘weather’ events, the making of carbon markets, etc. – exerted force in shaping responses and finding ways of explaining human impacts in discourse. These discursive and material relational encounters come to shape the emergence and subsequent movements of the carbon footprint metaphor at the dawn of the twenty-first century.

The Modern Emergence of Climate Change: 1834 - 1987

The common story of climate science for lay-audiences usually goes by way of key “forefather” figures who, since the nineteenth century, have made significant contributions to the field.²³ Beginning in 1834, French mathematician, Jean Baptiste Fourier first formulated a theory of what has become known as the “greenhouse effect,” the phenomenon whereby light energy easily passes in and out of the Earth’s atmosphere, whereas heat energy, because of its longer wavelengths, becomes trapped (Flannery 2005; Weaver 2008). Later that century in 1859, physicist John Tyndall’s experiments demonstrated the variable absorptive capacity of different gases, thus contributing to the knowledge that different gases produce different degrees of warming effects for the Earth’s surface (Tyndall 1859; Weaver 2008, 72). In the mid-1890’s the research of Svante Arrhenius associated decreased levels of atmospheric CO₂ on Earth with previous ice ages; thus did Arrhenius hypothesize that increasing carbon dioxide in the future would lead to future warming of the Earth (1896). Arrhenius predicted that, with a doubling of atmospheric carbon dioxide, “the world would warm by about 5 ° Celsius in

the tropics and about 6 degrees Celsius at high latitudes” – a proposition that has informed the notion of “climate sensitivity” later taken up by Manabe and Wetherald (1975) and also crucial to IPCC modelling (Weaver 2008, 73-74, 87).

In the first part of the twentieth century, through statistical data collection, Guy Callendar proposed that the Earth was warming and that the industrial burning of coal was the culprit (1938). Using global temperature records and estimating concentrations of carbon dioxide per million parts of air (ppm) during his time and projecting into the future, Callendar was able to posit a trajectory of warming that though “woefully” underestimating future emissions, marked a key contribution to contemporary climate science (Weaver 2008, 74). According to Tim Flannery, Callendar’s research was widely dismissed at the time both because it was regarded as amateurish and because *the warming trend in global temperatures ended* (Flannery 2006, 41). I will return to this important point below as it speaks to the role of “affect” and an important connection to larger-than-human agency in the cultural politics of climate change. Vindicated in contemporary climatology, Callendar is now known as “the scientist who established the carbon dioxide theory of climate change” (Fleming 2007). Interestingly, as Weaver notes, Callendar and Arrhenius took an optimistic view on the effects of these emissions and warming correlations; combustion of coal, CO₂ emissions and the ensuing global warming were projected to favourably contribute to human societies, especially in the realm of the agricultural benefits of longer growing seasons and the fertilization potential for plants exposed to increased carbon dioxide (Weaver 2008, 76).

Studies emerging in the mid-twentieth century took a more ambivalent stance on the relation between anthropogenic upheaval of carbon, global warming and the

experimental nature of the trajectory. Roger Revelle and Hans Suess advanced the notion that:

...human beings are now carrying out a large-scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future. Within a few centuries we are returning to the atmosphere and oceans the concentrated organic carbon stored in the sedimentary rocks over hundreds of millions of years. (Revelle and Suess 1957, 19-20)

Naming the unprecedented and unrepeatable nature of this experiment and anticipating exponential increases in rates of fossil fuel combustion on the trajectory of industrial development, Revelle and Suess strongly advocated documenting and understanding the relationship between the release of atmospheric carbon dioxide through combustion and weather and climatic processes (*ibid.*). This study was particularly revealing in its estimation of the longevity of carbon dioxide molecules within the atmosphere, where previously it was thought that the ocean might absorb more of this greenhouse gas. Again, however, their estimate of the ten year lag-time before CO₂ molecules dissolved into the ocean seems to have been under-estimated by orders of magnitude compared to more recent data which suggests that “75% of all human carbon dioxide emissions stayed in the atmosphere for an average of eighteen hundred years; 25% had a lifetime longer than five thousand years” (Weaver 2008, 86). The statement above by Revelle and Suess remains one of the most-cited in contemporary accounts of climate change; indeed as physicist and historian of climate change Spencer Weart suggests, this paper is “*widely regarded as the opening shot in the global warming debates*” (Weart 2007).

Just over a decade following the landmark paper of Revelle and Suess, oceanographer Charles Keeling (himself previously working with Revelle and Suess as a postdoctoral researcher) delivered an address to the American Philosophical Society

based on his own decade of collecting data on quantities of atmospheric CO₂. The 1969 talk was entitled, “Is carbon dioxide from fossil fuel changing man's environment?” Originally his talk was to be called, “If carbon dioxide from fossil fuels is changing man's environment, what will we do about it?”, but he was asked to change the title for reasons that were unclear to him (Keeling 1970, 10). Nonetheless, his talk remained aligned with the spirit of his intended title as it marks a key problem statement in the literature whereupon “anthropogenic” or human-induced climate change and specifically, anthropogenic carbon dioxide unequivocally take on a negative valence. As I develop below, Keeling’s address must be recognized as one of the pre-cursors to the explicitly political turn that climate change takes more forcefully at the end of the 1980’s because political and ethical questions strongly accompany the ‘facts’ as told by numerical data in his address and the article that was published in its wake.

The most notable scientific contribution of Keeling to the apprehension of anthropogenic climate change has been the “Keeling curve,” the graph that represents the continued increasing trend of atmospheric carbon dioxide as measured at the Mauna Loa observatory in Hawaii beginning in the 1957 and continuing today (Hulme 2009, 56-58; Keeling 1970). Accompanying his graphs of this curve in his address to the American Philosophical Society, however, was Keeling’s explicit statement that he was “meaning to inquire into what might be the response of scientists, philosophers, and decision-makers if specialists assert that accelerated use of fossil fuels may be harmful” (Keeling 1970,10). Keeling’s appeal at the end of his address from over forty years ago is remarkably similar in tone to many appeals by scientists who have come to inform the “scientific consensus” (Oreskes 2007) on anthropogenic climate change over the past

three decades. In his concluding remarks, Keeling forewarns that the people living in the twenty-first century “...along with their other troubles, may also face the threat of climatic change brought about by an uncontrolled increase in atmospheric CO₂ from fossil fuels” (1970, 17).

Manabe and Wetherald, whose research began in the 1960's, often round out the field of key figures of atmospheric science informing a contemporary apprehension of climate change (Hulme 2009, Weaver 2008). These scientists returned to Arrhenius' question on the sensitivity of the climate to a doubling of atmospheric CO₂, but this time the numbers were more precise. Using computational modelling, they predicted that a doubling of atmospheric carbon dioxide would produce a 2.9 degree Celsius warming of the planet (1975). Although in their ground-breaking paper they express reservations about the exact numbers suggested by their early computational models, these figures on “climate sensitivity” remain in keeping with the IPCC's assessment that a doubling of carbon dioxide would create warming effects “likely in the range of 2.0 C to 4.5, with a most likely value of 3.0” (Weaver 2008, 87). Manabe and Wetherald's paper (and their wider research) has a more objective scientific tone and is less explicitly laden with politics than Keeling's; however, their predictions for an increasingly warming future world generated crucial questions of a political nature that began to be taken up more explicitly in the late 1980's (questions to which I will return following the next section).

A number of other fields of the natural sciences began to coalesce to contribute to climate science in the latter half of the twentieth century. The research contributions of glaciology and paleoclimatology with regard to ice core samples taken in the 1980s confirmed that indeed lower levels of atmospheric CO₂ correlated with cooling glacial

periods on the planet (Weart 2003, 129-131). Through this ice core research scientists have determined that “[t]hroughout the last six glacial/interglacial cycles, captured in this record, atmospheric carbon dioxide levels have never gone above about 300 ppm or below 180ppm...Today carbon dioxide levels are sitting at around 385 ppm ...That’s almost 30% higher than at any other time over the last six hundred and fifty thousand years for carbon dioxide...” (Weaver 2008, 126).

This cursory glimpse at modern understandings of climate science (itself a much richer multi-dimensional field²⁴) for *lay* audiences reveals certain characteristics that shape the cultural politics of climate change and, in turn, the eventual emergence of the carbon footprint metaphor. The first characteristic is that the initial scientific apprehension of climate change has been largely achieved through a numerical abstraction of climate; the second features ‘carbon’ as a lynch-pin in this understanding of the problem; and the third characteristic is an attempt to connect this problematic carbon to an everyday politics of felt human effects and affects. A discursive tracing of some of the key texts reveals this movement from a seemingly disinterested abstract scientific account to what I draw out in this chapter as a tension-ridden “politics of affect;” the carbon footprint metaphor emerges as an affective mediator of these politics, presenting both promises and risks.

One of the salient characteristics that appears in early climate science and is carried through contemporary understandings of climate change is its heavy dependence on abstract numbers and statistics. This numerical-statistical component may be indispensable, but it must be understood as a partial and “situated knowledge” (Haraway 1991) and one that makes it difficult to relate to climate change in the ways that are

required for public mobilization on the issue. The “climate” of climate science is, by definition, only understandable through statistical records; indeed climate within this epistemological framework can be explained as the “statistics of weather” (Weaver 2008, 6-7).

The main articles of foundational climate scientists counsel that collecting numerical data is the first key step toward understanding climate change which in turn informs the predictive hypothesizing of running more numbers in computer simulations (Revelle and Suess 1957; Manabe and Wetherald, 1975). This statistical angle has been crucial in accounting for patterns and changes in scientific terms of climate change. Indeed, this angle has been the one through which we have even come to know about climate change as a planetary concern. As David Demeritt states, however, while statistical models have increasingly become the authoritative figures in climate change debates, these models have built-in assumptions and limits (2001). The Global Climate Model (GCM), comprised of diverse fields of scientific knowledge and super-computer-generated simulations, has become the powerful epistemological tool upon which responses to climate change have depended. Since there is no second Earth on which to run an analogous “experiment” of CO₂ input and cascading climatic processes and events, these simulations are attempts to do what science does: that is to have a ‘control’ on which to run potentially reproducible experiments. As complex as these are, however, the GCMs only account for and *simulate* physical and chemical relations among emissions of greenhouse gases, their atmospheric concentrations and climate; this relationship is rendered numerically (Demeritt 2011). The scale of the statistical model seems ‘holistic’ because these models present the Earth as a planetary system or

composite of other systems, but these systems are reduced to physical-chemical-biological interactions; the models do not (indeed cannot) account for all of the complex political and social relations involved in climate change. The result has been an initial attempt at a universalizing understanding of climate change that is prematurely divorced from the political and social contexts which make up the issue of climate change. These contexts are only belatedly added in the “downstreaming” of science in the public or policy circles (Agrawal and Narain 1991; Demeritt 2001). This separation of statistically-fluent expert climate scientists from a public trying to make sense of climate change remains a source of tension for political movement on the issue.

A key gesture among climate scientists in their communications about climate change to lay audiences is to correct the common public conflation of weather and climate. *Climate is what you expect; weather is what you get. Weather relates to what you wear today, whereas climate relates to the repertoire of clothes in your closet.* On the one hand, this distinction seems important to make and yet, as many commentators have noted, the most significant public belief and willingness to act on climate change seem to occur in the wake of extreme weather events (Hulme, 2009; Ungar 1992). The famous 2012 headline in the Bloomberg magazine in the wake of Hurricane Sandy - “It’s Global Warming, Stupid” (Barrett 2012) - testifies to this phenomenon: a meteorological event, conflation of weather and climate *and* the potential mobilization of a will to respond (I say ‘potential’ here because the will to respond often remains dormant after the immediacy of the event passes). What then, are we to make of this corrective gesture against the conflation of weather and climate, when events such as Hurricanes Katrina, Sandy and Haiyan and prolonged heat waves seem to be the catalysts that potentially

mobilize political action? Needless to say, it would be erroneous to claim every weather event is directly related to climate change; further, the localized ‘weather’ does not always corroborate a generalized longitudinal warming trend so relying on the weather to mobilize political action is dangerous (witness the tendency for increased denialism in the wake of the particularly cold and snowy winter of 2013-14 in populous parts of Canada and the U.S) (Mooney 2014). But there is something in this climate-weather force of relations that bears attention, as it reveals the need to connect the abstraction of climate change to something more proximally and viscerally felt or at least more relevant to lives lived not as statistical numbers. Perhaps one could say that climate change is what Demeritt calls a “statistical abstraction”(2011) and weather is one aspect of what we *feel*, with the additional emphasis that we seem to feel it more when it doesn’t conform to expectations that correlate to norms that in turn, when aggregated, make up climate. It is as if ‘we’ in a dominantly secular world order of human mastery and rationality can believe in what defies our ability to grasp (namely climate change) in those moments when we feel the full force of “nature” as a condition of possibility for our very existence. Although this concept of ecological embeddedness may be theoretically grasped, and may be felt more proximally by those whose ways of living are deeply embedded in such ecological materiality (Watts 2013),²⁵ dominant human societies seem disconnected from such understandings on a day-to-day basis where even basic needs are often met through long supply chains. Daily abstractions of ecologies coupled with the statistical abstraction of global climate change make this phenomenon difficult to sense in ways that generate political responses.

If climate is statistical and climate change then becomes known within this frame as a universalizing statistical abstraction largely described in numbers that cannot be felt, there remains an issue of connecting these numbers and statistics to the political, social and ecological worlds that have long constituted climate change. As I describe further below and throughout this dissertation, the promise of the carbon footprint metaphor, upon its emergence, lies in its potential to connect the numbers to a politics embodied in a larger-than-human world. But a risk of this particular metaphor is that it will foreclose upon this promise by yoking the abstraction of climate change to markets whose primary logic features profit accumulation rather than emissions reductions. Such risky logic is also premised upon existing asymmetrical global social relations.

A second related characteristic of these reduced accounts is that what is most often being tracked, counted and simulated statistically in understandings of climate change (along with correlated temperatures) is *carbon* dioxide. As the most abundant of the anthropogenic greenhouse gases which contribute positive radiative forcing, carbon dioxide bears the burden of being *the* representative anthropogenic greenhouse gas among others that include methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride (Weaver 2008 91-93). Indeed the standard measurement of greenhouse gases is in terms of CO_{2e} (carbon dioxide equivalent), and so the effects of all the other gases are enumerated relative to the effects of carbon dioxide. As the titles of the key papers of forefathers of climatology reveal, carbon dioxide has been the lynch-pin of understandings of climate change as they have evolved since Svante Arrhenius in the 1890's.²⁶ Charles Keeling is noted for having developed the most sensitive

instrumentation for tracking atmospheric carbon dioxide in the late 1950's, and tracking CO_{2e} has since remained a core precept of climate science (Weart, 2007).

Even in its non-CO₂ compounds, the element carbon is implicated in many layers of climate change, including through its presence in other anthropogenic greenhouse gases. Although its common name, methane, does not betoken its relation to carbon, this potent greenhouse gas – sixty times more potent than carbon dioxide (Flannery 2006, 30) – goes by the chemical formula of CH₄ where the lead 'C' refers to the one carbon atom bound with four atoms of hydrogen. Carbon is noticeably present in the names of two other human-created greenhouse gases: hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). The element of carbon is also found within the material antecedents to atmospheric carbon dioxide. "Hydrocarbons" name the liquid or gaseous compounds whose combustion has shaped contemporary societies; these hydrocarbons endure as the compressed organic remains of ancestor species from millions of years ago (Flannery 2006, 70-71). Contemporary climate change, then, implicates this particularly troublesome aspect of the carbon cycle which involves up-ending buried hydrocarbons, combusting them, and releasing carbon dioxide and its equivalents into the atmosphere. Paradoxically, however, the planetary carbon cycle is composed of other complex interactions as well, that is, of other carbon cycles or relationships and processes that are far from troublesome, but rather *foundational* to life. As a ubiquitous and shifty element that "bonds with almost everything non-metallic," carbon is complex (Flannery 2006, 31):

Carbon is ubiquitous on the surface of the Earth. It is constantly shifting in and out of our bodies as well as from rocks to sea or soils, and from there to the atmosphere and back again. Its movements are extraordinarily complex and are governed by temperature, the availability of other elements

and the activities of species such as ourselves. (Flannery 2006, 31)

If carbon is governed by so many things, not least of which are the ‘activities’ of the human species in the era of the Anthropocene, one of the biggest challenges of any attempt to respond to the troublesome parts of this planetary carbon cycle is to connect carbon with particular and complex human relationships and systems that govern its flows while keeping in mind the universal planetary cycle of carbon. To further complicate matters, atmospheric carbon cannot be seen by the naked eye, and climate science tells us that its warming effects are not felt in any immediate way, but may take decades (Weaver 2008). That is not to say that certain parts of the world are not already feeling and struggling with the effects of this warming, but to suggest that its lack of felt immediacy in the global north has stalled political movement. Thus, coupled with the need to develop scientific understandings of carbon from instruments, there is a critically important need to make sense of carbon less in terms of a numerical abstraction and more as *felt* proximal relations and processes in order to mobilize political responses. The question is, if we cannot feel carbon in the immediate somatic way that we feel extreme weather, is there another way to bring its impacts home to humans? As I describe below, carbon’s semiotic liveliness at the turn of the millennium in myriad metaphoric “carbon compounds” (Koteyko, 2010), including the metaphorical compound of the carbon footprint, illustrates an impulse to draw out these connections between bodies, discourses and carbon as the lynch pin of responses to climate change. In short, much of our material and cultural worlds at this historical epoch turn on the elemental figure of carbon and how it builds worlds through shifting attachments.

This realization of the seminal importance of carbon leads to a third key characteristic in the accounts of these foundational figures of climate science: as this realization takes hold, the tracking of carbon (dioxide, and carbon, more generally) becomes increasingly explicitly laden with political and affective questions about carbon and less able to assume a 'neutral' objective scientific position. That is not to say that science is ever neutral and solely fact-based; as Donna Haraway (1988; 2004), Bruno Latour (2004), Thomas Kuhn (1962) and others have suggested, science has always been entangled with values, and partial perspectives. This entanglement, however, often remains implicit in scientific texts such that scholars of science studies need to do a good deal of sleuthing to find the conditions that have shaped the formation of scientific knowledge.²⁷ In looking at the foundational texts of the founders of climate science mentioned above, however, there is a clear and explicit movement from more equivocal studies based on curiosity about the past causes of ice ages (in the case of Arrhenius) followed by modestly positive spins on the warming effects (for Arrhenius and Callendar) to explicitly politically-charged, future-oriented questions that draw causal implications of anthropogenic carbon emissions vis-à-vis the potential harm they induce (Keeling 1970). The fact that Keeling's 1969 talk was addressed to the American Philosophical Society lays bare a movement and interest in climate change beyond scientific circles. While it retains a large degree of numerical data, especially graphic evidence of the "Keeling curve" of correlated atmospheric CO₂ and temperatures for which he has become famous, Keeling's address is also remarkably affectively-loaded for one who comes from the 'objective' world of science. The written proceedings of this address reveal a turn in the tone of his talk, leading with the statement: "I believe that no

atmospheric scientist doubts that a sufficiently large change in atmospheric CO₂ would change the climate: we need only compare our atmosphere with the very hot CO₂-laden atmosphere of Venus to guess the consequences of an unrestricted CO₂ increase” (1970, 14). Keeling then goes on to name CO₂ as “just one index of man’s rising activity today” (ibid.). Among his other examples of ‘rising activities’ are some that may be thought of as positive and/or neutral activities, “rising college degrees, rising steel production” and many that take on more negative valences “rising divorces...severe air pollution” (ibid.). He also suggests “[at] the same time we have diminishing natural resources, diminishing distraction-free time, diminishing farm land around cities...” He then goes on to cite heavily from a 1968 article in the Los Angeles Times about one “Dr. W. Pidd... senior scientist at Gulf General Atomics” who was killed in a traffic accident while attempting to leave San Diego’s heavy smog to avoid a prolonged and intense bout of asthma (ibid.). In telling this story, Keeling recounts that he, himself, drove his own family away from La Jolla that day to avoid the smog attack. As a scientist, he had correlated that particular smog attack with “measurements of atmospheric CO₂ at the Scripps Institution of Oceanography which indicate that during the past year La Jolla [had] sometimes enjoyed levels of contaminated air comparable to severe smog in Los Angeles” (ibid.). So, in a short span of three paragraphs in this address, Keeling moves from the data of his statistical recordings to his “belief” that all atmospheric scientists know large increases of CO₂ would change the climate (with an inhospitable Venus as the worst case scenario), to references to more general messes we humans are leaving, to the circuitous guilt by association of CO₂ in the death by motor vehicle accident of a prominent scientist. One may easily criticize Keeling for what seems like an awkward attempt at mobilizing fear,

beliefs, and connecting scientific data on carbon dioxide to specific emotionally-charged media stories where CO₂ is the villain; in fact, a complex combination of various particulates, ground level ozone, nitrous oxide, and sulphur dioxide are implicated in smog-related asthma rather than CO₂ *per se* (American Geophysical Union 2014; National Resources Defence Council n.d.). Yet there is something in this story of connections that merits attention in the cultural politics of climate change in which the carbon footprint eventually becomes embroiled.

First, this story explicitly reveals that facts and values are always more entangled in scientific matters than is often assumed in attempts to separate scientific fact from value (Latour 2004). Nowhere is this entanglement more evident than in climate change as a knotted cultural and physical phenomenon that presses upon understandings of ‘normal’ science and requires asking more demanding questions than the “why” and “how” questions that dominate conventional science (Hulme 2009, 79). When the shifting numbers of atmospheric carbon dioxide are understood as largely the responsibility of humans and as profoundly impacting humans and other species, Keeling’s question of “what will we do about it” takes on greater salience in circles beyond normal scientific inquiry. Whereas up until this time, the scientific response to the question *what will we do about it* has been, to *monitor and measure carbon dioxide* (Revelle and Suess, 1957), the urgency of the negative effects of increased CO₂ warrants further questions like: *how do we generate interest in this issue beyond science?; what might we do individually and collectively about the issue?; how can the statistical abstraction of climate change as a function of increasing CO₂ be felt/ brought down to an Earthly politics?*

Such questions began to be taken up throughout the 1970's and 80's.²⁸ Amid a growing concern for pollution and wider environmental issues that was evident in foundational best-selling texts such as Rachel Carson's *Silent Spring* (1962) and The Club of Rome's *The Limits to Growth* (Meadows *et al* 1972) as well as through events such as the first Earth Day in 1970, an agenda for treatments of climate change began to emerge. Further, the urgent issue of the destruction of the protective stratospheric ozone layer of the Earth by chlorofluorocarbons (CFCs) brought into visibility the global atmosphere and the unintended impacts of human technologies upon this protective planetary membrane. The first international conferences on climate change such as The World Climate Conference in 1979 and the Villach Conference in 1985, attended to the concerns of both ozone depletion and the emerging issue of climate change (de Souza 2008). The World Climate Conference was held in Geneva in 1979 with the resulting launch of the World Climate Research Programme, a network of international climate scientists who would establish the physical basis of climate and model the effects on the climate of scenarios of human-caused inputs of greenhouse gas emissions (WMO).²⁹ The Villach Conference in Austria in 1985 was the first to call on governments to start thinking about international agreements for limiting emissions (U.N.).³⁰ Thus, the groundwork was laid for a new era of world research aimed at tracking atmospheric CO₂ to understand and govern climate change as a planetary concern.

The second noteworthy aspect of Keeling's intriguing address is that he is describing a network of effects that features larger-than-human agency. As Latour suggests, despite modern narratives of human actors as masters, environmental issues such as the hole in the ozone layer and, more recently, the urgent climate crisis reveal a

fully entangled politics of human and non-human force-relations and processes that challenge such narratives (1987; 1993; 2004). Keeling inadvertently hints at these connections by describing the CO₂ levels (a combination of human & non-human forces) on a particular day which may have been associated with smog (another combination of human and non-human forces), which precipitated movement away from such harm-inducing forces, and ultimately resulted in a fatal car-accident (yet another hybrid of human and non-human forces). This may seem a trivial example of a singular incident that is misused by a scientist to generate responses for a non-scientific audience, but this story of network effects presages the events of 1988 described below, and an on-going *politics of affect* that is foundational to the cultural politics of climate change and one of its key mediators, the carbon footprint metaphor.

Keeling's story suggests that a serious consideration of the cultural politics of climate change might appropriately begin with attention to *affect* as a field of forces and relations that combine facts and values in larger-than-human worlds. Recent political theories of affect have been decisive in establishing affect not as feminized emotion that resides in a human subject and that is gendered in opposition to rational cognition, but as a moving force or set of forces and relations that draw bodies together or away from each other (Ahmed 2004; Bennett 2010; Gregg and Seigworth 2010; Massumi 1995; 2002). Affect therefore does not properly belong to or reside in any particular subject/body but rather moves through relational encounters and "shape[s] the very surfaces of bodies" (individual and collective) that appear in politics (Ahmed 2004, 4). In this respect, affect theory is not occupied with determining what a body is (ontology), but rather how bodies surface, and how they affect and are affected by other bodies. This line of thinking comes

from Spinoza's formative and oft-quoted line "No one has yet determined what the body can do" (1959, 87). How bodies and collectivities – both human and non-human – are drawn together and affect each other through capacities to act is a profoundly political aspect of climate change. In my analysis, I show that by drawing certain bodies together and alienating other bodies, the carbon footprint metaphor plays a central role in this politics of affect.

While Ahmed draws attention to the social relations of affect between people,³¹ with Bennett (2010), Massumi (2002) Deleuze and Guattari (1987) among others, I situate the importance of understanding affective relations and processes in larger-than-human encounters, especially in the politics of anthropogenic climate change. One important note about affect that the above theorists of affect agree on – is that it is claimed to be pre- or perhaps supra-discursive, that is to exceed the discursive fields of meaning and signification and instead to circulate as "energies" or "intensities." The intensities of the larger-than-human relations – through for example moments of extreme "weather" or, in Keeling's story, asthma-inducing smog – have been decisive in drawing certain actors together and orienting responses in climate change politics. The matter of climate change suggests that a politics of affect be thought of (at least partly) in this pre-discursive register because the visceral relations that are tied to this natural-cultural phenomenon of climate change exceed the human enterprise and linguistic representations (thus to engage with metaphor involves paradoxical thinking as I explain in the introduction and more thoroughly in Chapter Two). Nonetheless, with Lawrence Grossberg (2010) and Kathleen Woodward (2009), I suggest that attention to affect does not preclude attention to how discourse enters into relationality with materiality. Affect,

for Grossberg is the mediating term that “constitutes the relationality” (2010, 327) and for him even (human) structures of meaning are “affectively charged” with forces beyond the authorial intent of such structures of meaning (2010, 328). I develop the role of this affective mediation in the particular case of carbon footprint metaphors in the next chapter, and the analysis that follows attempts to trace the forces and intensities that shape key actors and their capacities to act with regard to climate change. As I elaborate throughout this dissertation, the actors described and drawn together in relational encounters through this metaphor can be as ontologically diverse as: individual ‘human’ subjects in the privileged Global North as manifestations of their household interactions with the global economy; physically-embodied CO₂ in mangrove roots as a manifestation of complex larger-than-human relations over time; the international body of the Intergovernmental Panel on Climate Change (IPCC); carbon markets; and ‘global citizens’ with crucial internal variegations as manifestations of disproportionate responsibility for emissions and disproportionate inheritances of negative effects of these emissions.

The hybrid case described by Keeling suggest that these ways of apprehending climate change may not be fact-based rational experiences of climate change as statistic (for how can bodies feel statistics?), nor are they reducible to cases of simple human subject-centred emotion as opposed to rational understanding, but they nonetheless reveal potent political force through relational encounters that can be accounted for through a politics of affect.³² Seigworth and Gregg suggest that “affect arises in the midst of an *in-between-ness*: in the capacities to act and be acted upon” (ibid., 2010, 1). In the cultural politics of climate change, affective relations of *acting and being acted upon* must be

considered under the terms of the Anthropocene (as discussed in the introduction) which flags humans as the species with perhaps the greatest planetary effects, but effects that are nonetheless generated in larger than human relations and processes. Recognizing these affective relations in which humans are both affecting life processes on a ‘geologic’ scale while at the same time being affected by all of the other vital bodies that compose planetary life reveals effects and processes that escape human intentionality, thus starkly troubling notions of human mastery. That is not to say that affect always ‘plays’ to this agenda of a politics of troubling human mastery. Affect is involved in force relations of all kinds:

As much as we sometimes want to believe that affect is highly *invested* in us and with somehow magically producing a better tomorrow, as if affect were always already sutured into a progressive or liberatory politics...as if affect were somehow producing always better states of being and belonging – affect instead bears an intense and thoroughly immanent neutrality.
(Seigworth and Gregg 2010, 10)

As I develop below and throughout this dissertation, the carbon footprint metaphor as an entity that yokes together unlikely things, plays a crucial role as a mediator of the cultural politics of climate change. This process of yoking generates a variety of effects, including re-entrenching fossil fuel intensive trajectories. The metaphor describes the surfaces and draws together affecting bodies (like ‘carbon’ and ‘market’ or ‘carbon’ and ‘mangroves’) for diverse agendas and thereby initiates a range of actions that bear scrutiny. As Seigworth and Gregg suggest, “one of the most pressing questions faced by affect theory becomes ‘Is that a promise or a threat?’ No surprise: any answer quite encompasses both at the same time...” (ibid.). Sympathetically, then, my question about carbon footprint metaphors entails asking, “Is that a promise or a risk?” of the connections and actions fostered in each of the metaphor’s mediations. My case studies

reveal that the answers about carbon footprint metaphors are similarly ambivalent, as their attachments encompass both promises and risks.

I will more explicitly develop the notion of the carbon footprint metaphor as an affective mediator in the next chapter. First, I will return to the chronology of the decade leading up to the emergence of this metaphor in the story of the public apprehension of climate change. This decade began with a number of key political meetings and events as well as some profoundly felt weather that effectively and *affectively* drew publics into an emerging cultural politics of climate change with unprecedented force.

Connecting Climate Change and CO₂ to Emerging Bodies Politic: 1988 – 2001

Despite the almost two centuries of scientific research that has coalesced to produce contemporary climate science, 1988 seems a commonly identified point of departure in the narrative of a public apprehension of climate change (Boykoff 2011; Hulme 2009; McKibben 2011; Weart 2008). The heterogeneous forces that coalesced in that year reveal the cultural politics of climate change to be a complex blend of numbers, carbon, and ‘feeling’ generated in large part by larger-than-human forms of agency that connected the issue to bodies of individuals, states and emerging global organizations. While some might read the forest fires and heat waves that I describe as symptoms of *anthropogenic* climate change, that is of the power of human activities to change the weather and climate, the locus of agency in ecological politics must be read, paradoxically, as always larger-than-human (Bennett 2010; Latour 2004). Again, this is not to remove human responsibility from the mix, but to accord the undeniable presence and power of non-humans as essential to the ways in which human responsibility might be re-figured with this relationality in mind.

Maxwell Boykoff suggests 1988 as a watershed moment for how climate change “flowed into full public view” (2011, 48). First, the year led with the evidence that the previous year, 1987, had been the warmest of 130 years on record and, of those years, the five warmest all occurred in the 1980s, according to the University of East Anglia (Hulme 2009, 64). As the year progressed, forest fires and deadly heat waves ensued in North America and parts of the Mediterranean and China, and Super Hurricane Gilbert hit the Gulf of Mexico and the Caribbean causing so much destruction in its wake that the name Gilbert was retired – a distinction reserved by the World Meteorological Organization for only the most deadly and destructive hurricanes (National Hurricane Center, n.d.). 1988 quickly displaced 1987 as the hottest on record (Weart 2014, 40-42).

Coinciding with the beginning of the heat wave of that year, in June more than three hundred delegates from forty-eight countries convened in Toronto for “The Changing Atmosphere” conference which called on severe reductions of greenhouse gases in order to stabilize atmospheric levels of carbon dioxide (COSPAR 1989). A number of key international figures, including Gro Bruntland, Prime Minister of Norway and lead of the UN World Commission on Environment and Development’s influential report *Our Common Future* (1987), were hosted by Prime Minister Brian Mulroney, key policy experts and scientists. In the wake of this event, significant statements affirming the problem and the need to act were made by politicians including George Bush Senior and Margaret Thatcher who made a speech to the Royal Society in London in September (Hulme 2009, 65). This conference initiated a “Call For Action” to “reduce CO₂ emissions by approximately 20% of 1988 levels by the year 2005 as an initial global goal” (World Meteorological Organization 1989, 296).

In what has become one of the most iconic moments of that year, NASA scientist James Hansen testified to the U.S. Senate at the end of June in the midst of the severe droughts in North America. Notably, Hansen also testified in hearings in 1986 and 1987, but these caused only a “minor stir” (Weart 2014, 38). On that sweltering day of June 23 1988, presenting evidence in graphic form, Hansen drew the following three conclusions that were taken up by the politicians present as well as by the media who spread the word in public fora:

Number one, the earth is warmer in 1988 than at any time in the history of instrumental measurements. Number two, the global warming is now large enough that we can ascribe with a high degree of confidence a cause and effect relationship to the greenhouse effect. And number three, our computer climate simulations indicate that the greenhouse effect is already large enough to begin to effect the probability of extreme events such as summer heat waves. (Hansen 1988/2011, 47)

This testimony in the context of a blistering heat wave can be read as a marked turn in which science, politics and the felt weather coalesced forcefully in the cultural politics of climate change. Hansen’s leap into politics launched an increase not only in media coverage, but also in numbers of annual congressional hearings on climate change in its wake (Hulme 2009, 64).

Hansen has been criticized by his scientist colleagues for the premature certainty of his testimony, especially in relation to his third conclusion – that the probability of extreme weather events like that summer heat wave was correlatable to anthropogenic climate change (Oreskes and Conway 2010, 184); however, perhaps this move reveals Hansen’s keen sense of how a “*connecting thread of experience*,” as Massumi (2002) describes “affect,” was needed to supplement the scientific apprehension of climate change as statistical abstraction in order for political movement to occur within the

public. Sensing that politicians were more likely to accept the evidence of anthropogenic climate change at a time when impressionable bodies might actually be hot in the summer weather, Hansen arranged with Senator Timothy Wirth (a noteworthy keynote speaker at The Changing Atmosphere conference earlier that month in Toronto) to testify at a Congressional hearing extraordinarily during mid-summer after his previous testimony on a chillier November day (Weart 2014, 38). Clearly, Hansen could not have orchestrated the weather to cooperate in quite the way that it did, but he made a wager that a certain larger-than-human affective force or intensity (the warm summer weather) would connect people more viscerally to troubling symptoms of anthropogenic climate change that are due to intensify in an increasingly warming world. His wager paid off when the extreme weather of that summer seemed to hammer home the need to pay attention to this urgent matter that would launch a whole host of cascading regional, domestic and international issues (agriculture, health, economy). Climate change during this summer "...was no longer a scientific abstraction about an atmospheric phenomenon" (Weart 2003, 155), but a profoundly visceral event. In tracking the relative perceived importance of climate change for the North American public in the late 80s and early 90s, Sheldon Ungar suggests, "[w]hat rendered 1988 so extraordinary was *concatenating* physical impacts *felt* by the person in the street" (emphasis in original) (1992, 490). If media attention to the matter offers one clear view into how climate change suddenly mattered in the public, the sudden movement from the secondary newspaper pages of science to front page, leading headlines in most North American media outlets was remarkable. "[A]s media coverage doubled and redoubled, the additional stories moved into social and political areas" (Weart 2014, 45). The year 1988,

given its remarkable weather that connected people through lived experience to what might be anticipated under the impacts of climate change, was an important year in which an extra-human agency registered forcefully and explicitly in the emerging cultural politics of climate. Stephen H. Schneider, an atmospheric scientist at Stanford and a key policy advisor since the 1980's suggested, "[i]n 1988, nature did more for the notoriety of global warming in fifteen weeks than any of us [scientists] or the sympathetic journalists and politicians were able to do in the previous fifteen years" (1988, 203).

Although his use of 'nature' risks reinforcing an artificial separation of humans from nature, Schneider's attunement to larger- than-human factors that comprise climate change politics hints at *distributive agency* or a heterogeneous network of human and nonhuman forces that interact within this phenomenon. When combined, these affective forces suggested that given the deaths, wildfires, agricultural (and economic) losses of that year, especially crippling to the super-power of the United States, it was high time to start governing climate change to mitigate against such vulnerability.

Coincidentally, 1988 is also notable as the year in which the Intergovernmental Panel on Climate Change (IPCC) was created. The IPCC represents an institutional merging of two already interdisciplinary and cross-sectoral organizations, the United Nations Environmental Program (UNEP) and the World Meteorological Organization (WMO). Like its parent institutions, the IPCC explicitly combines science and politics. As Naomi Oreskes suggests, the IPCC is "an unusual scientific organization: it was created not to foster new research but to compile and assess existing knowledge on a politically charged issue" (2007 Oreskes, 68). The IPCC constitutes a key political body in attempts to govern the climate in international circles as an information-compiling,

consensus-gathering organization that enables an information-diffusion model in the politics of climate change. “The IPCC quickly established itself as the principal source of scientific advice to policy-makers” (Weart 2003, 161). The cultural politics of climate change – as partly indexed by media representations – has taken its cues from the tone of IPCC reports with the most decisive IPCC statements generating the most front-page news (Boykoff 2011). The urgency of doing something about climate change is in part generated by the tone of each IPCC report, but also as the year 1988 famously revealed, such urgency is also partly driven by the affects generated by weather as they connect publics and politics around the issue of climate change.

While the conditions of the year 1988 seemed to generate solid momentum toward cooperative political action on climate change, including the curtailing of CO₂ emissions, strong affective forces were also aligning to prevent such action, and to eventually shape specific interest-based marketized responses to the matter. In response to the creation of the IPCC and a growing awareness of the troubling connection between unbridled economic growth and greenhouse gas emissions, a powerful industry lobby group of those who stood to lose a great deal by the curtailing of carbon dioxide emissions assembled to push against consensus on the thesis of anthropogenic climate change. The Global Climate Coalition (GCC) – whose clever naming belies its foundational climate change denialism – formed in 1989 (Weart 2003). Composed of key, mostly Anglo-American, companies in fossil fuel industries (Exxon, General Motors, Ford Motors, Shell, and British Petroleum), the agenda for this organization was to leverage scientific uncertainty to create confusion and sow doubt in the public (Revkin 2009; Weart 2003). With its own retinue of select scientists offering counter -‘evidence’

to that of the IPCC, the GCC became a highly influential body in the cultural politics of climate change, shaping policy treatments that were to develop such as the Kyoto Protocol as I describe below. The methods and tactics employed by the GCC and the wider denialist movement have been borrowed from the powerful, well-funded and highly successful tobacco industry play-book; some of the players, physicists Frederick Seitz and S. Fred Singer, were even the same (Oreskes and Conway 2011, 5). These scientists, their conservative think-tank and fossil fuel industry funders have served not only to forestall consensus on climate change, but also to preserve their own interests even as widespread consensus occurred and global governance agendas began. The mark of the GCC and like-minded organizations appears in the subsequent steering of international agreements toward preserving business as usual and eventually, the attempt to tame CO₂ within a liberal market rationality, thus leveraging carbon's market value in the generation of profit. As my analysis in the following chapters demonstrates, traces of these effects linger in the mediating metaphor of the carbon footprint which affectively pulls bodies towards or away from certain other bodies, and actions.

The first IPCC report in 1990, just two years following the creation of the panel, “rehearsed the usual ambiguous warnings about the possibilities of global warming. This was nothing exciting or surprising and the report got hardly any newspaper coverage” (Weart 2014, 49). As the first of its kind in a very conservative consensus-aimed organization, the report suggested that some of the warming *might* be attributed to non-human causes and that another decade of research would be necessary to confirm the anthropogenic greenhouse gas hypothesis (Weart 2003, 164). Notably, the particularly cold winter of 1989 in North America after the record-breaking heat of the summer of

1988 created a decline in the immediacy of the issue in the public (Weart 2014, 43). In this same period, the Marshall Institute, a conservative think tank of policy-oriented scientists – including Fred Seitz with connections to the Global Climate Coalition – began to generate oppositional reports to discredit IPCC, arguing that ‘natural’ increases in solar output were the causes of recent warming trend (Oreskes and Conway 2010, 187). Their report of selectively-picked data presented by selectively picked scientists who refuted the anthropogenic climate change thesis was embraced by the American Petroleum Institute in 1991 and the World Petroleum Congress in 1992 (ibid., 189). What is more, this report has been credited with generating American opposition to regulating fossil fuels through binding targets and carbon taxes since the Marshall Institute exerted important influence on the White House (ibid., 190).

A number of other related political bodies emerged in the 1990’s that began to shape the surfaces and the tensions within and across climate change politics. From the Rio Conference or “Earth Summit” in 1992, the United Nations Framework Convention on Climate Change (UNFCCC) emerged as the treaty process for dealing internationally with the issue. The goal of this treaty since its inception has been the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (UNFCCC 2014). One of the identified means to reach this goal has been the creation of national emissions inventories which would count the baseline of CO_{2e} of each country and track these emissions with the objective of curtailing the upward trajectory, especially in industrialised countries that are mostly responsible for these emissions. With this proposition, counting CO₂ became the occupation of nation states and a cascading number of other organizations (including

corporations) who had a stake in this new form of accounting. This conference also produced Agenda 21, a voluntarily implemented set of guidelines to be enacted at various levels of governance aimed at fostering development and curtailing environmental degradation, pollution and poverty. The first paragraph of the preamble to this lengthy document sets up a context of a watershed moment in which “sustainable development” becomes the vehicle through which to rectify existing global asymmetries and deteriorating ecosystems:

Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can - in a global partnership for sustainable development. (Agenda 21, 3)³³

178 countries signed on to this program, including the George Bush Senior administration of the United States. This document reveals that emerging agendas of climate change were being tethered to an agenda of “sustainable development,” a notion fraught with tensions. On the promising side, the framework both recognizes the importance of ecosystems and centrally accounts for asymmetrical global relations of power and resources as an object to overcome; however, on the risky side, as many commentators have argued, sustainable development also relies on notions of prosperity that often depend on, or inadvertently result in resource exploitation and unequal power relations (Bernstein, 2000; O’Connor 1994). These tensions have plagued the annual Conference of the Parties (COP) that has been held under the UNFCCC treaty process

since 1995. Significantly, this was the body out of which the Kyoto Protocol emerged at the 1997 COP in Kyoto, Japan.

Agenda 21 and its “defining moment in history” draw the cultural politics of climate change toward what Steven Bernstein calls a new order of “liberal environmentalism” (2000). Whereas from the late 1960s “early attempts to address global environmental problems produced a weakly institutionalized set of norms suspicious of industrialization and economic growth,” in the 1990s as the agenda of climate change was coming to the fore, the norms shifted (*ibid.*, 465). “Norms of liberal environmentalism predicate environmental protection on the promotion and maintenance of liberal economic and political order... [suggesting that] environmental protection, economic growth and a liberal international economy are compatible, even necessarily linked” (*ibid.*). This compromise has allowed wider participation and interest in the global concerns of climate change throughout the 1990s and beyond; however, attaching climate change solutions to a predicated promotion of a liberal economic and political order offers certain actions as appropriate and forecloses upon others. This order of liberal environmentalism shapes a normative “distribution of the sensible” (Rancière 2004) in the cultural politics of climate change in which the carbon footprint metaphor is embroiled, as I describe in Chapter Two. What/who comes into political visibility and speakability is often shaped by these institutionalized norms which in turn shape the available responses in these politics. The norms of liberal environmentalism were subsequently institutionalized through the particular mechanisms of the Kyoto Protocol which created an embodied “carbon market” as described below.

Also in 1995, the second IPCC Report provided more solid evidence that the Earth was warming, projected that future serious warming was likely and that humans were responsible at least in part for this predicament (IPCC 1995). This report made the front page in many prominent media outlets and was immediately recognized as a landmark (Weart 2003, 173). The Global Climate Coalition once again appeared to discredit the forceful evidence of IPCC scientists, especially attacking the credibility of Ben Santer, one of the leading scientists whose research focused on understanding the unique human ‘fingerprint’ of anthropogenic CO₂ as one of the decisive proofs of human effects on warming. (Oreskes and Conway 2010, 204-207). William O’Keefe of the American Petroleum Institute and Donald Pearlman “an industry lobbyist and registered foreign agent of several oil-producing nations” launched a number of attacks directed at Santer and the IPCC, claiming that the report was manipulated to suppress opposition and uncertainty (ibid., 207).

Other notable events occurred that year that have been instrumental in displaying the importance of distributed agency for on-going apprehensions of climate change. In January of 1995, 1500 kilometres of the ice sheet, Larsen A in the Antarctic broke off in what was evidence of abrupt effects of warming event that was to continue (NASA 2002). 1995 also emerged as the new warmest year on record to date, a record that was to be broken in 1997 and 1998. According to Weart, however, the warming effects were mostly felt in the Arctic and other distant ocean regions, so the “impact was muted” in dominant societies (Weart 2014, 52). In a politics of affect, such events and movements were too distant to forcefully connect with certain dominant political bodies and collectivities that mattered (unlike the 1988 events which connected and collected

individual, national and cross-sectoral industry bodies with powerful non-human forces in a globally powerful American context). Given these distant impacts and the powerful lobby that was spinning particular aspects of scientific uncertainty to concoct generalized scientific uncertainty about anthropogenic climate change, the urgency of the matter was not yet forcefully felt by wider publics.

In 1997, the Kyoto Protocol of the UNFCCC was established with the explicit goal of setting binding emissions targets for industrialized nations. Although there was great promise in this particular first step in climate change governance, especially in the wake of the Montreal *Protocol* launched in 1987 which successfully mobilized international governance of ozone-depleting technologies, it was subject to a number of constraints. Key among these constraints was the lobbying of the Global Climate Coalition and its associates who feared the negative economic impacts of governing climate change through curtailing fossil fuel emissions-based development. This lobby was one of the main reasons cited for the eventual American refusal to sign on to the Kyoto Protocol (Weart 2014 50-52). When the negotiations over baselines for emissions targets were taking place, the lobby-influenced U.S. proposed that 1990 be the baseline year, while most other governments suggested more stringent standards. “The greenhouse debate had now become tangled up with intractable problems involving fairness and the power relations between industrialized and developing countries” (Weart 2003,174). Such issues of fairness and global asymmetries also appear within certain instances of the carbon footprint metaphor as I elaborate in Chapter Three, but these issues are often overshadowed by the interests of well-funded lobbying on behalf of maintaining the imperative of global economic development.

The ill-fated Kyoto Protocol was ratified in 2005 with a commitment period for participating nations of 2008-2012. While there is much to be said about the perceived *failure* of this agreement to bind an international community in governing climate change through emissions reduction targets, the principles of commodifying carbon certainly achieved wide appeal and were supported by nascent development opportunities through the Kyoto mechanisms that established a carbon market. For while the Kyoto protocol further bolstered the spirit of the UNFCCC's imperative to count and reduce carbon at the scale of the national body politic of signatory countries (a goal that has achieved little success), crucially, it also established a new international calculus of carbon as commodity (a goal that has proven much easier to achieve):

Countries with commitments under the Kyoto Protocol to limit or reduce greenhouse gas emissions must meet their targets primarily through national measures. As an additional means of meeting these targets the Kyoto Protocol introduced three market-based mechanisms, thereby creating what is now known as the "carbon market." (UNFCCC 2014b)

As outlined above, the primary means of achieving the goal of limiting greenhouse gas emissions was to be directed at national scales whereby quantitative targets set in international negotiations would be met by nations' internal policies and processes. The carbon market approach was to be a *supplemental* means by which to achieve these targets, recognizing that asymmetrical development in international relations and initial costs to transition from fossil fuels might create barriers in the achievement of targets. "The mechanisms help to stimulate green investment and help Parties meet their emission targets in a cost-effective way."³⁴

The three market-based mechanisms instituted through the Kyoto Protocol were: emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation

(JI). The first of these mechanisms, emissions trading, can be seen as the primary mechanism through which carbon shifts semiotically to create a new body, the “carbon market” to which to attach the governing of climate:

Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets. Thus, a new commodity was created in the form of emission reductions or removals. Since carbon dioxide is the principal greenhouse gas, *people speak simply of trading in carbon. Carbon is now tracked and traded like any other commodity. This is known as the "carbon market."* (Emphasis added)³⁵

This passage from the UNFCCC makes explicit three key shifts that shape the cultural politics of climate change and conditions the emergence of the carbon footprint metaphor: first the text reinforces the established importance of a calculus of carbon dioxide as the stand-in for all greenhouse gases, continuing the emphasis on carbon in the cultural politics of climate change; second, through ellipsis, the passage shifts to simply ‘carbon’ as a free-floating signifier that is available in popular discourse to become attached to the market; and third, carbon gets newly captured as a commodity to be tracked and traded.

Following this shift, through the Clean Development Mechanism (CDM) outlined in Article 12, the unit of one tonne of CO₂ then becomes the standard for a certified emission reduction (CER), which sets up the specific means through which industrialised nations (Annex B) can earn credits to help with their targets. This mechanism:

...allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting Kyoto targets.³⁶

While there have been many progenitors to this scheme, including the pollution markets of the 1980s (Lohman 2011), this mechanism as the UNFCCC suggests, is a “trailblazer. It is the first global, environmental investment and credit scheme of its kind, providing a standardized emissions offset instrument, CERs” (ibid.).

Article 6 of the Kyoto Protocol outlines the last mechanism of the carbon market, the Joint Implementation (JI) which:

allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex B Party, each equivalent to one tonne of CO₂, which can be counted towards meeting its Kyoto target.³⁷

At play in the unfolding of the Kyoto Protocol is the institutionalizing through particular mechanisms of a liberal environmental order that began with the UNFCCC’s Agenda 21. These mechanisms must be foregrounded as they usher in the risk through which the carbon footprint metaphor eventually comes to work in the service of a liberal environmental order. The expressed primary goal of the Kyoto Protocol was the reduction of emissions with the ‘additional means’ of meeting targets through markets; however, means and ends seem to have been reversed in the actual unfolding of the protocol. The liberal environmental order of carbon markets has become the primary outcome of this process. According to World Bank data, the carbon market increased almost six-fold, from \$11 billion U.S to \$64 billion over the three year period after the ratification of the Kyoto Protocol in 2005.³⁸

This institutionalizing of an embodied liberal environmental approach to climate change depends on the initial metaphoric shift of carbon in the production of the compound ‘carbon market.’ The shift instituted in the text of the Kyoto Protocol makes

possible an affective attachment of CO₂ to the pre-existing body of an international market, creating a saleable CER unit per tonne of CO_{2e}. Such a liberal environmental rationality relies on the principles of a supposed self-adjusting market but also, as the Kyoto process attests and commentators on liberal rationality suggest, it also depends on international and state actors to create, promote and regulate the order in the first place (Polanyi 1944),³⁹ and on the flows of powers through bodies as individuals and populations to perpetuate this rationality (Foucault 2007; 2008).⁴⁰ This carbon market therefore features a newly institutionalized metaphoric shift to create an explicit new order of carbon within climate change politics, but the move is continuous with the norms of liberal environmentalism that were established throughout the 1990s and first institutionalized in 1992 with the Earth Summit in Rio as described above. Analyzing particular cases of carbon footprint metaphors, as I do in each of the following chapters, one can see the limits of liberal fantasies of “self-organizing markets with beautiful powers of rational self-adjustment” (Connolly 2013, 31) as *the* going solutions to climate change.

I wish to flag this aspect of the Kyoto Protocol as an important part of the story of the heterogeneous conditions leading to the emergence of the carbon footprint metaphor. As noted above, however, in addition to the creation of this new carbon market, the Kyoto Protocol also fosters continued political dialogue on asymmetrical global relations vis-à-vis responsibilities for, and felt impacts of greenhouse gas emissions; such tensions of differing agendas shape emerging instances of carbon footprint metaphors and their promises and risks at the turn of the millennium.

Returning to the chronology of IPCC reports, the Third Assessment Report (TAR) of the IPCC, released in May of 2001 sounded a more forceful alarm by stating that most of the unprecedented global warming in the past half century was likely to have arisen from anthropogenic greenhouse gas emissions (IPCC, 2001). For a conservative body aimed at capturing only what could receive the most broad support as consensus, this report seems to have been decisive enough to have received definitive endorsement from “every major nation from the United States to China” as a wake-up call to address the issue (Weart 2014). Indeed the Global Climate Coalition, the consortium of the strongest industry-led climate change denial lobby, began to lose members and eventually disbanded in 2002 in the wake of this report that gave deniers much less ground for support through uncertainty (Union of Concerned Scientists 2007; Weart 2003, 188). At this point, suggests Weart, “...the discovery of global warming was essentially completed. Scientists knew the most important things about how the climate could change during the 21st century. How the climate would actually change now depended chiefly on what policies humanity would choose for its greenhouse gas emissions” (Weart 2014, 5). Weart’s gesture highlights that the next necessary move in the cultural politics of climate change might then be to explicitly return the ‘humanity’ (and its larger than-human connections) to the issue.⁴¹ Although these social, political and ecological elements and relations have always been constitutive of climate change, they have often been buried through an impossible quest for ‘just the facts’ that have shaped climate change politics.

Once the seemingly-generalized ‘consensus’ of 2001 on anthropogenic climate change was achieved, key questions remained: how would these human actors re-appear

or enter into the speakable terms of Earthly politics and how would these human actors be connected to the larger-than-human relations and processes that constitute climate change? For at the same time as this scientific consensus was taking hold, a quickening understanding of political “dissensus” was arising along with the need for interventions in making this phenomenon register with force in the everyday spaces of public life. As Oreskes suggests “there are reasonable differences of opinion about how best to respond to climate change and even about how serious global warming is relative to other environmental and social issues” (2007, 76). Further, some have “confused – or deliberately conflated” these differences of opinion and scientific complexity with scientific uncertainty on the whole proposition of anthropogenic climate change (ibid.). The mediations of language are at the heart of such matters. Acknowledging the scientific complexity that plagues treatments of climate change, Nerlich et al suggest that there remained an issue as to “how this complexity is brought down to earth, is made communicable and manageable though language” (2011, 46). As noted above, however, the question need not simply lead to a diffusion model of linguistically rendering scientific complexity understandable to an ignorant public and managing it through the tools of language; the complexity of anthropogenic climate change had already been reduced through climate science in a sense since this science necessarily brackets social and political questions. Part of what was at stake then, was to explicitly return the social, political and ecological complexity to the notion of climate change since the bodies, relations and processes involved in this urgent matter are not simply numerical abstractions. This work had begun throughout the 1990s with the instituting of

international political and market-based bodies to begin to address the issue (with all the ensuing tensions of liberal environmentalism) but connections were yet missing.

At the turn of the millennia in the cultural politics of climate change, an opening to understandings of the mediating role of ‘discourse’ appears in the IPCC’s Third Assessment Report (2001). Working Group III: Mitigation, Section 5.3.8.5 of the report entitled “Discourse and Symbolism” highlights the need to connect climate change to language through “discourse,” as a political practice that involves power relations. “Discourse or narrative – the written and spoken word – is one of the most important ways in which governments, business, NGOs, and the media influence each other and build agreement on policy directions” (IPCC 2001). This section of the IPCC report not only newly identifies discourse as a key site to consider for the working group on mitigation, but it also implicitly recognizes *political struggle mediated through language* at the centre of the politics of climate change. For while *scientific* consensus on the problem may have been largely achieved,⁴² political consensus on responses to the issue remain far from decided. The IPCC passage acknowledges the need to “build agreement” on political responses, thus illuminating on-going struggles and tensions that take place through discourse. Importantly, these tensions and struggles do not suddenly appear when the IPCC first acknowledges the role of discourse; these tensions have been part of the conditions I have been describing in narrating the apprehension of climate change. The Kyoto Protocol negotiations gave evidence to some of these tensions which do not go away with what Weart calls the “complete” discovery of climate change. Nonetheless, what was perceived as a new shared consciousness of human impacts at the turn of the millennium led to an opening for new discursive mediators to connect responses to public

bodies at multiple scales, not simply the international bodies that had been emerging in the past decade.

Enter the carbon footprint metaphor...

Significantly, this explicitly discursive turn in climate change politics at the turn of the millennium coincides with the entrance of the carbon footprint metaphor that popularly caught the imaginations of publics and took root in the cultural politics of climate change. Metaphors are tropological figures *on the move* and involved in human struggles to *represent* in language at the same time as they involve affectively connecting larger-than-human force relations through visceral impacts; these figures then, are central to the politics of climate change vis-à-vis who/what they bring into presence and what actions are possible or not for actors. As mentioned previously, compound metaphors involving carbon – what Koteyko (2010) calls linguistic “carbon compounds” – had been appearing sporadically over the last decade, but they had received little attention as part of these politics, nor had these carbon compounds entered into daily discursive practices of the ‘subjects’ and ‘citizens’⁴³ – those who have footprints and who were involved in the urgent concerns of climate change. I suggest that this metaphor emerges in part out of a timely quest to affectively describe the surfaces of bodies and collectivities in order to apprehend the ways in which they can respond to these emerging politics. This metaphor, then, in part responds to the question: *how can shifting carbon connections be attached, grounded and fixed (if contingently so) to bodies across individual, national and other scales that are part of this urgent issue of climate change?*

The carbon footprint metaphor appears very sporadically in the early 2000s, and achieves a ‘viral’ quality in 2007 in public discourse with much attention to its novelty.⁴⁴

2007 is the year in which the carbon footprint becomes the Oxford English Dictionary's "word of the year" (OED) and this is the year that my first textual case studies in what follows (carbon footprint reduction lists) begin to emerge with force. No single person or source has claimed either authorship of this metaphor or definitively identified its source. Finding the exact point of origin of the carbon footprint remains an elusive task. What is clear from looking at its earliest iterations, is that those who first use it and attempt to define its contours are suggesting that this metric (not metaphor) contributes to climate change solutions, but who they imply as having a footprint and what they suggest these footprint makers do about it profoundly shapes a diverse range of solutions.

The first carbon footprint metaphor that I have been able to trace appeared on the now-defunct website, safeclimate.net, a project of the Washington DC-based non-profit organization World Resources Institute.⁴⁵ Although the website and its carbon footprint calculator are no longer operational, the traces of carbon footprints linger.⁴⁶ On September 1 2001, CIO Magazine, a magazine aimed at Chief Information Officers in Business, reported on the launch of a website, safeclimate.net and its new tool, a carbon footprint calculator⁴⁷ aimed at "helping individuals and organizations calculate and reduce their output of carbon dioxide" (Kaplan 2001, 1). "SafeClimate.net's main tool is a calculator that measures your 'carbon footprint' or the amount of carbon dioxide emitted by your activities or those of your business" (ibid.). While the World Resource Institute (WRI) is a not-for-profit policy-research organization, it has at its origins, the tensions of its founding funders – The MacArthur Foundation, Ford Foundation and the Rockefeller Brother Fund – whose philanthropic power emerged in large part out of a liberal economic order of profit generation intimately connected to oil extraction and

related industries.⁴⁸ Further, the WRI has been centrally involved in the promotion of “offsetting” (a notion and problematic practice to which I return in Chapter Three) carbon impacts through carbon markets (WRI 2010); thus its approach to global environmental (“resource”) issues and specifically, climate change is apparently shaped by this liberal economic order. Although the carbon footprint calculator and safeclimate.net no longer exist, the fact that this carbon footprint metaphor is next picked up in a business magazine suggests that this footprint is significantly attached to the bodies of organizations that have a stake in preserving the norms of a liberal environmental rationality. In the wake of the seeming consensus at the turn of the millennium, publicists of many major corporations were “abandoning the claim that there was no global warming problem and shifting to claims about the most business-friendly way to address it” (Weart 2014, 51). This is not to suggest that denial of anthropogenic climate completely vanished; as Weart suggests, “ExxonMobil continued to spend tens of millions of dollars on false-front organizations that amplified any claim denying the scientific consensus” (ibid., 51-52). When the visceral effects of climate change seem distant, the power of such denial seems to play more easily to widespread passivity, even amongst “believers” in responding to the crisis. The fact that climate change became a more mainstream concern linked with ‘business-friendly’ approaches, however, again highlights the tensions of a liberal environmental order that risks addressing climate change through business-as-usual profit-oriented systems.

I will not dwell on this particular instance of the carbon footprint both because it no longer exists for analysis and because I am interested in the metaphor’s viral emergence in the public in 2007, but I wish to briefly flag this vanishing instance to

illustrate this aspect of the carbon footprint metaphor's emergence which draws on and risks bolstering a liberal order of economic development.

Most who try to define or take up the metaphor however, also suggest that its roots lie within the metaphor of the ecological footprint – a metaphor/metric stewarded by ecologists that deliberately and explicitly highlights and critiques human “overshoot” of a planetary carrying capacity that results directly from a liberal expansionist economic order (Wackernagel and Rees 1996). As I describe in the next chapter and in my case studies, these and other tensions exist within and across the instances of the carbon footprint metaphor. The struggle in metaphoric meaning resulting in a disturbance to the norms of liberal market-oriented anthropocentrism is what I identify as the promise of this metaphor.

Because of the conditions out of which the carbon footprint metaphor emerges, and because of its very metaphoricity, there will be no singular defining way of making connections through the metaphor, but certain normative orders will exercise pull. My analysis of case studies in Part Two explores these normative orders and also the disruptions to these orders that are mediated through the carbon footprint metaphor. Owing to the specific scientific inheritances of the apprehension of climate change, this metaphor is involved in a calculus of carbon, so forms of carbon accounting and numbers will feature in the functioning of this metaphor. Further, as the unfolding cultural politics of the 1990's attest, this carbon calculus has become tethered to an international order of liberal environmentalism whereby counting carbon (in order to reduce emissions) depends on the accounting principles of a carbon market. The carbon footprint metaphor will shape and be shaped by these norms; however this metaphor also mediates tensions

and paradoxes that trouble such norms. Since there is no particular and singular author of this metaphor, I argue that it emerges out of an affective flow of distributed agencies that includes forces as ontologically diverse as ‘felt’ weather, scientific instruments involved in the numerical apprehension of climate change, a shifting semiotics of carbon (including through carbon markets), and the pre-existing metaphor of the “ecological footprint,” to which I will briefly turn in the next chapter. Due to these hybrid conditions, the carbon footprint metaphor appears at the turn of the millennium as a shifty figure.

Continuing into the early 2000s until the present, public interest in, and responses to climate change seem to ebb and flow according to heterogeneous forces that include carbon markets, IPCC meetings, “weather events,” and increasingly, cultural texts such as films, books and magazines geared at popular audiences. I will not delve in depth into these but briefly situate some key illustrative events as they pertain to the case studies of carbon footprint metaphors that follow. The illustrative cases I draw on here are largely from Anglo-American contexts both because these contexts are largely the ones in which my carbon footprint case studies emerge and because the hegemonic (though waning) global leadership position of the United States situates this country as a key player (and crucially, a key emitter) in global climate change politics.

Reminiscent of the events of 1988, in 2005, the power of larger-than-human forces again propelled climate change onto a public agenda. Hurricane Katrina presented an ominous harbinger of things forecast to come including inundations of water to coastal areas, violently dislocated peoples and intense storms. Once again as one climate scientist pointed out, it is “absurd” to directly correlate this particular event (or any other) with anthropogenic climate change (Kerry 2006); yet the same scientist’s research

also suggests that the thermodynamics of land and sea temperatures are intimately connected to the intensity of storms: “My results suggest that future warming may lead to an upward trend in tropical cyclone destructive potential, and – taking into account an increasing coastal population – a substantial increase in hurricane-related losses in the twenty-first century” (Kerry 2005, 686). Regardless of the accuracy of the specific correlation in the case of Katrina, in these everyday cultural spaces that draw publics into the issue, images of the effects of the hurricane were connected to questions around how “we” humans were contributing to an increase in such catastrophes. Even *as* the hurricane was making landfall in New Orleans, *Time Magazine* featured the article “Is Global Warming Fueling Katrina?”⁴⁹ In the wake of Katrina’s devastating effects, many other popular news magazines similarly made the connection.⁵⁰ World leaders beyond the U.S. also made connections, especially in efforts to call out the U.S. for not signing on to the Kyoto Protocol which was to be ratified in 2005. John Prescott, the Deputy Prime Minister of the U.K. controversially asserted, “[t]he horrific flood of New Orleans brings home to us the concern of leaders of countries like the Maldives, whose nations are at risk of disappearing completely. There has been resistance by the US government to Kyoto - which I believe is wrong” (Jowit and Temko 2005, np).

With the images and felt effects of the previous year’s storm still fresh in the cultural memory of publics, 2006 presented a number of important political forces that came into play. The 2006 release of the film, *An Inconvenient Truth* (Gore and Guggenheim) compellingly launched the science of anthropogenic climate change into the popular spaces of cultural representations. This film won numerous awards, including an Academy award for best documentary in 2007, and garnered both box office success

and critical acclaim. One of the only notable criticisms of the film from climate scientists centred on the legitimacy of using images of Hurricane Katrina to tell the story of anthropogenic climate change, when such a single event could not really be correlated with climate change as a series of aggregated events (Borenstein 2006); yet animating the scientific graphs with seemingly sensationalized images of real people in encounters with larger-than-human forces was surely one of the most compelling provocations of the film. For many, such connections drew publics to what the abstraction of climate change *might* increasingly feel like. This film still ranks as one of the best documentaries of all time on many current lists.⁵¹

Also released in 2006, the unprecedented and widely cited *Stern Review: The Economics of Climate Change*, made the strong case that to act immediately to mitigate against worsening climate change and to adapt to the inevitable changes would be more cost effective than to delay. The economist and lead author, Nicholas Stern suggested that the costs of stabilizing the climate to between 500 and 550 ppm CO₂e would amount to about 1% of GDP if such measures were to be taken immediately, as opposed to costs of about 5 - 20% of GDP if actions were to be delayed past the 10-20 year mark (Stern 2006, vii). Comfortingly appealing for many, however, was the proposition that tackling climate change would be a market opportunity:

Action on climate change will also create significant business opportunities, as new markets are created in low-carbon energy technologies and other low-carbon goods and services. These markets could grow to be worth hundreds of billions of dollars each year, and employment in these sectors will expand accordingly... Tackling climate change is the pro-growth strategy for the longer term, and it can be done in a way that does not cap the aspirations for growth of rich or poor countries. (Stern 2006, viii)

Such statements echoed the liberal environmental order dominating responses to climate change. Business Week in its popular “best of” year-in-review suggested the global warming was the “best idea” of 2006 (Business Week 2006). According to this popular magazine, 2006 was “the year global warming went from controversial to conventional for much of the corporate world” (ibid.). This article cited a number of cases in which major corporations – including DuPont, GE, and Wal-Mart – began to address climate change due to multiple pressures including “personal awakenings” of CEOs and threats to the ‘bottom line’ due to insurance liabilities and court cases resulting from climatic changes (ibid.).

As Max Boykoff’s studies of American media attest, reporting on climate change again peaked in 2007 with the IPCC’s Fourth Assessment Report (Boykoff 2011, 21). This report more forcefully stated the “unequivocal” nature of the warming of the climate (IPCC 2007), and “in the range of possibilities the IPCC had warned about, the worst was coming to pass. For example, the summer ice covering the Arctic Ocean was shrinking remarkably swiftly” (Weart 2014, 68). The release of the IPCC’s AR4 led to a dramatic spike in news headlines and reporting in its wake (ibid., 110). To cap off the year of the IPCC’s release and of the Academy award for *An Inconvenient Truth*, Al Gore and the IPCC scientists were awarded the Nobel Peace Prize for “their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.” (Nobelprize.org, 2007).

According to Boykoff’s analysis, public attention and reporting on climate change slowed slightly in the latter half of 2007-2009 due to many factors, most pressingly, the

onslaught of a global economic recession that directly and immediately affected many people in their daily lives (Boykoff 2011, 21, 116). Yet as my analysis of carbon footprints metaphors demonstrates, many popular carbon footprint reduction books were emerging at this time as well. Notably, as my first case studies of these lists reveal in Chapter Three, the money-saving effects of reducing one's carbon footprints features prominently in these lists. It is within these lists that one can see the shifting of responsibility for addressing climate change from the regulating bodies of nation states and intergovernmental organizations onto the individuals who are asked to conduct themselves appropriately according to a carbon footprint reduction list. The carbon footprint in these list resonates with wider reporting patterns identified by Max Boykoff that are coherent with "dominant market-based and utilitarian approaches to discussing the spectrum of possible mitigation and adaptation action on climate change" (2011, 117).

Another watershed moment occurred in 2009, with the much-anticipated 15th Conference of the Parties to the UNFCCC in Copenhagen. The resulting Copenhagen Accord, which was supposed to provide a strong successor to the Kyoto Protocol, ultimately created only a weak document with soft targets and no binding commitments. The well-timed public release of so-called cover-up e-mails of Climate scientists in advance of the meeting – the scandal known as "Climategate" – also dominated news coverage and affected public opinion on the necessity to act swiftly and globally on mitigation efforts. This scandal involved the breach/hack of a server at the Climate Research Unit (CRU) at the University of East Anglia and the leak of personal e-mails of a number of key climate scientists whose comments, taken out of context, seemed to

confirm for denialists the “hoax” of anthropogenic climate change. Although the official inquiry into the scandal cleared the scientists of the charges of falsifying data, the trust in climate scientists and the proof of anthropogenic global warming had been shaken (Weart 2014, 69). Record cold temperatures in many parts of the States in December of that year, coinciding with the Copenhagen Summit, also played into public ambivalence on the need to act (Leiserowitz et al, 2010).

Fluctuating public attention to climate change in the last five years has continued to be influenced by such factors as “weather events,” political contexts and scientific reports, such as the IPCCs Assessment Report 5 (AR5) which was released over the course of 2013-14. Continuing the pattern of increasing confidence in the growing evidence of human impacts on the climate system (but still conservative in its claims),

The Summary for Policy Makers from the IPCC states:

Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems... Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen (IPCC 2014, 1)

This report again made headlines during its release, with many world leaders quoted on the need to act decisively (Harvey 2013). In September 2014, a key UN sponsored meeting of world leaders was held in New York in anticipation of a pivotal Paris Conference of the Parties (COP 21) to take place in 2015. The UN Summit in New York also presented the occasion for a “Peoples Climate March” that drew 400, 000 people to the New York streets in the largest ever rally of its kind (Visser 2014). The political will expressed at this event and others around the world compelled leaders to respond. In his

publicised address at the UN Climate Summit just two days after the rally, President Obama declared, “Alarm bells keep ringing. Our citizens keep marching. We cannot pretend we do not hear them. We have to answer the call” (Obama 2014). Both Pope Francis and Ban-Ki-Moon have expressed similar public messages of urgency beseeching leaders to finally take strong cooperative and binding action at the Paris COP 21 meeting (Vidal 2014; Volcovici and Taj 2014). At the dawn of the year 2015, NASA AND NOAA (The National Oceanic and Atmospheric Administration) confirmed the suspicions felt by countless publics around the world over the past year: 2014 was the warmest year on record in modern history (NASA 2015).

My point in providing a brief sketch of some of these key moments in an ongoing public apprehension of climate change is to situate the carbon footprint in these dynamics of the cultural politics of climate change where larger-than-human affective forces are at play. As Boykoff suggests, cultural politics of climate change weave together “intersecting political, scientific, and ecological/meteorological climate themes” (2011, 117). The stories and movements in various publics “are not expressed in isolation from one another; rather, they are both consciously and unconsciously deployed in the dynamic arena of larger political, economic, social, environmental and cultural conditions” (ibid., 117). My aim, then, is to trace the mediations of the carbon footprint in this interplay of: the risks of liberal environmental market-based approaches that come to dominate responses to climate change, and the promises of the appearance of larger-than-human actors that might animate alternative political responses.

Chapter Two: Affective Mediations of ‘Carbon Footprints’

Before setting the stage to analyze carbon footprint metaphors as affective mediators in three case studies, I will first briefly parse the metaphor to unpack some of its constitutive tensions that arise alongside the apprehensions of, and responses to climate change described in the previous chapter. My approach to this metaphor’s constitutive linguistic elements – carbon and footprint – is to understand them as double-valenced, that is to see each of these linguistic elements as simultaneously carrying both material and cultural meanings. I begin below by expanding the discussion on *carbon* as the preeminent but highly shifty material signifier of ecological crisis in the late twentieth and early twenty-first century, then I turn to the foundational metaphor of the *footprint*.

Allotropic Carbon

Following the carbon footprint metaphor as a guide to the high stakes material and cultural significance of *carbon* at the turn of the millennia offers a glimpse into its valences in seemingly endless contexts. There is a certain dissonance that might be posed by a *carbon* footprint; as mentioned in the Chapter One, the actual concern indexed by this metaphor features a set of carbon compounds – not carbon in general (or in isolation) – as well as other greenhouse gases. Clearly, none of these gases has a “footprint” in the literal sense but the metaphor has strong resonances nonetheless; indeed, these gases are invisible suggesting that one function of the metaphor is to make visible and tangible something that can’t be seen. Carbon as a scientific term has entered public discourse more recently as a kind of vague signifier that connects to coal and other fossil fuels that are burned and produce unpleasant, even harmful effects; thus, it may be that the carbon

footprint easily stands in as a measure of negative atmospheric effects. But carbon is also implicated in all kinds of other cycles (materially and metaphorically) that come to influence its modifying role in the footprint metaphor.

A cursory glimpse at carbon's origins as a word and an element reveals an entanglement of "nature" and "culture" at its roots. While what we now call carbon has always been a foundational element of planetary life, it was not scientifically identified as such until the late 18th century when chemists began to isolate the various 'elements' of which matter was made.⁵² The word, carbon, derives from the Latin for charcoal or "burning coal" (*carbo*), but different words were used to describe other elemental forms of carbon like graphite and diamonds,⁵³ that were not associated with the fuels that people used in antiquity. Carbon is therefore 'modern' as a scientific-discursive element, although ancient in its various manifestations in human history, and prehistoric in its material conditioning of planetary life.

As a chemical element, carbon exhibits the property of *allotropy*: "the existence of a chemical element in two or more forms, which may differ in the arrangement of atoms in crystalline solids or in the occurrence of molecules that contain different numbers of atoms" (Encyclopedia Britannica).⁵⁴ Allotrope combines the Greek origins of *allo* meaning "other"⁵⁵ and *trope* meaning "turning toward", or "affinity to."⁵⁶ Thus, the epistemological contributions of chemistry foreground the tendency of elemental carbon to turn toward other or multiple forms even in its elemental manifestations as: diamond, graphite and more recently, fullerenes and fullerene-related nanotubes (Hirsch 2010). In other words, the embodied forms of carbon as an element are highly diverse because of the relational encounters and processes in which it is involved. Carbon is currently

recognized as having three to five allotropic forms, but there is also a category called “hypothetical allotropes” which leaves open the possibility of forms such as chaoite that are thought to exist in meteorites (*Handbook of Mineralogy, n.d.*).⁵⁷

What is remarkable is that carbon as an element can take on such widely divergent structural forms depending on the arrangement of atoms; each of these forms not only looks different to the naked human eye, but it generates different effects and affects. The politics and affects associated with diamonds as symbols of wealth, devotion and fraught geo-political relations, are quite different from those generated by the allotrope of graphite, as an early material used to record information. Recently, graphite has been gathering value as a key component in a growing market for fuel cells and nuclear reactors (Lifton 2012). Meanwhile, the newest discovery of carbon nanotubes apparently holds the promise of “solving humanity’s most pressing problems,” including climate change related ecological issues, according to the Smalley Institute Grand Challenges research group at Rice University.⁵⁸ Paradoxically, then, a certain elemental carbon (though strictly in its compounded bonding with oxygen as CO₂) takes on the burden of being *the* material index of the problem of climate change, even as certain other carbon allotropes, such as carbon nanotubes, promise to fix problems associated with food, water and other environmental issues that are brought about or exacerbated through climate change. Understanding this allotropic property of carbon as a chemical element suggests that relations, processes and bonding capacities matter profoundly in its manifestations, its movements, its promises and risks.

Notably, carbon as a discursive or cultural element displays a similar polyvalence, taking on different forms and arrangements according to myriad relations and processes.

In other words, carbon as a *trope* – a *turn* of phrase or figure of speech – is similarly susceptible to allotropic attachments that manifest in different cultural and material forms (eg. carbon *as* commodity, carbon *as* index of greenhouse gases, carbon *as* life). This is not to say these discursive forms are “natural” or elemental; rather they are political, contested, and consequential. For this reason, I do not claim to “discover” and analyze specific allotropic discursive forms of carbon as arrangements of semiotic carbon atoms, as chemists have done with the chemical element of carbon and its allotropes; to do so would be to black box certain semiotic forms of carbon as more primal than others and to enshrine a one-to-one scientific representational logic of language that metaphor explicitly overturns. Rather, my purpose for explicitly considering carbon’s allotropic character is twofold. First, understanding carbon’s non-essentialist allotropic qualities functions to unsettle the ways that carbon footprint metaphors are used to grant authority to questionable practices by virtue of their assumed empirical-quantitative status. Because of carbon’s scientific associations, this linguistic element is often used in discourse to legitimate questionable claims (witness climate change denialist Ezra Levant’s use of the carbon footprint metaphor to legitimize development of Canada’s bitumen sands – described in Chapter Four). Second, explicitly recognizing the semiotic and material *turning* of this element foundationally situates carbon as a kind of *trickster* figure⁵⁹ - both material and metaphorical itself - whose shiftiness is all-too-well becoming clear at a time of changing climates. Carbon has been an indispensably constant figure that has shaped planetary life and has enabled human progress through technologies of fire, internal combustion engines and even aeronautical engineering technologies that ironically promise to reduce greenhouse gas emissions of air travel

through reductions of airframe weight brought about through the use of lightweight carbon fibre (Edwards, 2008). However, carbon is now turning on humans – or perhaps more accurately, dominant human societies are overturning (hydro)carbons – such that carbon seems at times, a duplicitous associate. ‘Our’ fraught history with this element suggests that, from an anthropocentric perspective, “carbon represents the best and worst of life” (Miodownik 2006, 6). Of course, paradoxically, the Anthropocene also gestures at ‘humanity’ as a duplicitous associate – both in terms of certain dominant societies of humans and their disproportionate impact on other humans, and in terms of the human species’ generalized effects on our fellow species. But rather than reading carbon (or ourselves) as duplicitous, the more pressing task is to trace the ambivalent possibilities of certain associations and processes. To nuance Mark Miodownik’s statement above:

carbon’s allotropic associations and processes (including carbon footprint metaphors) present political promises and risks. Carbon is enigmatically present in cultural-material entanglements as both an enabler and an impediment, both a ‘problem’ and a ‘solution;’ teasing out what is being enabled or obstructed, by and for whom, is a central goal of tracing carbon footprint metaphors.

Upon the allotropic formation of carbon as an element, another layer of shiftiness occurs in its compounded forms. Carbon as material actor has a unique ability to “bind to itself and to nearly all elements in almost limitless variety” (Hirsch 2010, 868). As Nelya Koteyko’s investigations of lexical carbon compounds reveal, linguistic or discursive carbon is equally promiscuous in its compounding attachments. Given that carbon in neither its material nor cultural forms “naturally” bonds singularly with a specific form or political agenda, carbon compounds must be read as profoundly ambivalent mediators in

the cultural politics of climate change. I propose, via my case studies, that the political promise of carbon as a trope lies in its capacity to bring into visibility what Jane Bennett calls a “vibrant materiality that runs alongside and inside humans” but is also avowedly larger-than-human (Bennett 2010, viii). Such a move affords a lively force to entities normatively constructed as “passive matter” (ibid.,vii). By contrast, the political risks attaching to carbon’s tropological movements feature carbon as an object to be managed and mastered by intentional human agents in human-centric systems. Paradoxically, even as carbon is recognized as an element that has been disastrously ‘upearthed’ by humans through pretensions of human mastery that belatedly recognize the power of larger-than-human forces, these same pretensions of mastery are evident in certain proposed solutions for ‘managing’ carbon. As my analysis demonstrates, such human-centric instrumental solutions risk not only reinforcing existing globally asymmetrical human relations, they also risk bolstering existing destructive emissions trajectories that worsen the effects of climate change. These promises and risks resonate with the movements of carbon’s tropological partner in the compound metaphor of carbon footprint.

Shifting Footprints

While carbon has only recently achieved widespread circulation as a modern cultural trope, the trope of the footprint traces back within a longer cultural history that extends well beyond modern western culture and into antiquity. Footprints have been integral to signifying systems of early peoples from all continents of the globe and have come to trace the imprints of beings as diverse as “early men, giants, heroes, devils, saints, animals, ghosts, witches, fairies and monsters” (Bord 2004, 1). With so many valences signifying both ‘good’ and ‘evil’, ephemerality when pressed in sand and permanence

(when preserved in stone⁶⁰), the footprint is a mark or trace that is pregnant with possible meaning. Thus, it is a highly ambivalent trope in political and ecological contexts. In terms of its compounded manifestation in the carbon footprint metaphor, I am interested in focusing on a particular set of tensions revolving around the footprint metaphor's capacity to figure: western humanist orientations of selfhood; orientations toward material connections with other (humans); and orientations toward a larger-than-human relationality/ecological sensibility. Although dictionary definitions are only part of the story of footprints as metaphors, the *Oxford English Dictionary* offers a glimpse into a range of denotations from “the impression left by a shoe or a foot on a surface” to “the area covered by something in particular” to “the impact on the environment of human activity in terms of pollution, damage to ecosystems, and the depletion of natural resources.”⁶¹ The latter part of the definition no doubt owes in part to the now normative sense of the ecological footprint analysis/ metaphor (discussed below). Notably, the OED definitions are particularly humanist in their orientations, although they do figure humans centrally in ecosystems. Perhaps its initial appeal to western humanist subjects – those whose lifestyles may be most problematically implicated in climate change – is one of the “footprint's” initial promises, as I describe in Chapter Three; however, appealing only to this position also limits the footprint's other generative capacities. Here, I will briefly gesture at some of these possibilities and limits as they will be further unpacked in the analysis of particular carbon footprint metaphors.

Humanist Footprints

The footprint occupies a distinctive, even canonical place in dominant western humanist imaginaries. From Lucy's fossilized footprint to “humanity's footprint” as a sign of a

species that has dangerously overshoot the Earth's capacity to support us (Dodds 2008), this figure inscribes both the origins and the potential ends of the human as a species. In short, the footprint chronicles a fragile and precarious species history of humans and humanity. An often-quoted verse in the classic poem "A Psalm of Life" by Henry Wadsworth Longfellow suggests:

Lives of great men all remind us
 We can make our lives sublime,
 And, departing, leave behind us
 Footprints on the sands of time;
 (1838)

In the poem, Longfellow argues against reading life fatally as fleeting and futile and he elevates works of art of "great men" as part of their enduring legacies, their "footprints" that are read by others as comforting. In this case a footprint is a positive signifier of lasting legacies (like the tongue-in cheek image of a carbon footprint that leads my dissertation). The allusion is paradoxical, however, because although the footprint outlives the bodily presence, the mark is on the "*sands* of time" which still betokens a fleeting impression. Such paradoxes of the footprint put this metaphor into play in myriad contesting ways; the footprint both calls attention to a precariousness and ephemerality of humanity that might be signified through the devastating and deadly impact of the human footprint as responsible for producing climate change *and* suggests that the footprint might be a comforting legacy, a sign of existence within larger communities over time.

Another one of the most canonical texts in which footprints appear to express this western humanist imaginary of precariousness is the story of *Robinson Crusoe* by Daniel Defoe (2003/1719). Upon spotting Friday's footprint for the first time after many years on the island as a lonely castaway, Crusoe plummets into a profound psychosis that

disturbs both the “normal” routines of everyday survival in his island life and even his fundamental belief in God:

It happened, one day about noon going towards my boat, I was exceedingly surprised, with the print of a man's naked foot on the shore, which was very plain to be seen in the sand. I stood like one thunder-struck, or as if I had seen an apparition; I listened, I looked round me, I could hear nothing, nor see any thing; I went up to a rising ground to look farther; I went up the shore and down the shore, but it was all one, I could see no other impression but that one. I went to it again to see if there were any more, and to observe if it might not be my fancy; but there was no room for that, for there was exactly the very print of a foot, toes, heel, and every part of a foot; how it came thither I knew not, nor could in the least imagine. But after innumerable fluttering thoughts, like a man perfectly confused and out of my self, I came home to my fortification, not feeling, as we say, the ground I went on, but terrified to the last degree, looking behind me at every two or three steps, mistaking every bush and tree, and fancying every stump at a distance to be a man; nor is it possible to describe how many various shapes affrighted imagination represented things to me in, how many wild ideas were found every moment in my fancy, and what strange unaccountable whimsies came into my thoughts by the way.

Many postcolonial scholars have commented on Crusoe’s colonial, racist reading of the footprint of the “savage other.”⁶² The perspective of the colonizer who has built up an attitude of entitlement to his property and its accompanying resources resonates within many humanist imaginaries, including in some instances of the carbon footprint as I describe below. The footprint in this passage also functions as a figure bound up with existential issues featuring individuals with/against other humans and/or species. The passage hints at the footprint as an “apparition,” one which foundationally shifts the ground upon which Crusoe walks. Significantly, the shift that Crusoe experiences gestures toward a profoundly relational entanglement of presence and absence: *where is the (absent) maker of this footprint, and how does his/her presence on the island threaten to bring about my own absence through death?*

The footprint may not always indicate a threat, but it does carry the force of a presence-absence and self-other set of relations. In this narrative, the footprint also functions as a kind of mirror reflecting back to “man” an image of identity and difference whereby Crusoe sees in the footprint an image of a fellow human who is at once the same and different. While by the end of the narrative of *Robinson Crusoe*, Friday’s presence transforms to one of comfort and community (albeit crucially still within a colonial asymmetry), the initial footprint inaugurates a profound shift in consciousness and practices, for Crusoe. As Stephen Curkpatrick affirms, “[p]aradoxically, the footprint provokes a desire to destroy his [Crusoe’s] own traces” (2002, 249). Friday’s footprint therefore functions first, to make Crusoe’s own footprints *appear* as one of (at least) two humans on the island, and second, to produce the need to hide his own traces from view. While Crusoe had carved out a self-interested means of subsisting on ‘his’ island over a number of years (asserting a sovereign autonomy that also functions in the making of a Western subject whose ‘footprint’ I explore in Chapter Three), the hint of a threatening presence from another human suddenly inaugurates a shift in his perception whereupon he situates himself as one among others with whom he might compete for the resources of the island and even bare existence itself.

So it may go with carbon footprints. Although a single footprint may provoke no crisis, the accumulated carbon footprints of the human species (again, with crucially differing sizes) figure a more daunting prospect that haunts future survival and produces the desire to remove or hide from view these individual traces. The footprint thus not only produces effects that operate irresolvably within and across the complex scales of individuals and species (or subjects and citizens as theorized in Chapters Three and

Four), it also appears paradoxically to figure certain forms of “self-erasure” that are figured in the instances that follow in this dissertation (for example, the mechanisms of making one’s imprint disappear through the market).

The passage from *Robinson Crusoe* in its allusion to apparitions suggests that the footprint metaphor be situated as a profoundly political “trace,” which intimates the footprint as a metaphorical opening for conceiving of political relationality in a politics of appearance and disappearance.⁶³ As a space that literally figures a once-present being to be read by another, a footprint invites a special sensibility to the shifting politics of appearance in relational encounters.⁶⁴ This sensibility serves as a means of tracing what/who is made present or visible (or not) in certain carbon footprint metaphors. Carbon footprints can be tracked instrumentally in order to strictly define and operationalize a contained quantifiable ecological impact that *appears*, and they can also be traced for openings to others (not yet accounted for) that haunt such quantified appearances.⁶⁵ The politics of this metaphor are energetically charged within this play of attempted (en)closures and openings provoked by heterogeneous actors who are entangled in climate change politics.

Even if one is not familiar with the story of *Robinson Crusoe* or the significance of the fossilized footprint of Lucy, the iconic original ancestor of modern-day humans, footprints also carry familiar and everyday metaphorical associations that shape the effects of carbon footprints. Although accumulating footprints can engender feelings of danger as described above, they can also evoke associations with romantic love or even transcendental love as does the popular Christian poem “Footprints in the Sand” (Stevenson 1936),⁶⁶ which tells a tale of the footprints of a comforting invisible God

walking alongside a human subject/narrator of the poem throughout the course of her life.⁶⁷

Footprints may evoke these positive everyday associations, but the associations that the “carbon footprint” is *meant* to evoke are negative, rather than positive,⁶⁸ reminding on even a mundane level, of messes that are left behind – dirty footprints in clean places – even though they may be unintentional. Carbon footprints suggest that while there is a certain inevitability to human impact on earthly environments, we can do many things to minimize and mitigate the human traces. Thus, the metaphor seems to capture the popular imagination because it suggests both that individuals are bound to have some environmental impact and that they can do various things to mitigate that impact. The footprint thereby locates a particularly apt metaphoric site for considering ecological relations. As I elaborate in the next section and throughout the dissertation, the metaphor of the carbon footprint both continues problematic western humanist traditions that tie into contemporary liberal environmental logics, and breaks with these same traditions depending on its associations and the openings it fosters. The degree to which it breaks with such traditions is crucial to what I’m calling its promise and the degree to which it perpetuates a certain history of human sovereignty and its current manifestation through the market is crucial to what I am formulating as its risks.

Ecological Relations of Footprints

The *ecological footprint* was coined in 1991 by William Rees and Mathis Wackernagel through their work on urban sustainability within the framework of ecological carrying capacity (1992). This framework, conventionally measured in terms of numbers of organisms, provides a means of hypothesizing the size of a population that can be

sustained within a specific region without irreparably damaging the ecosystem. By inverting the notion of carrying capacity, Rees suggested we can conceive of the amount of land required to sustain a given community within a material standard as the “ecological footprint” (measured in hectares) of that community. Revolutionary in its subversion of carrying capacity, this framework allows an understanding that certain human populations not only exceed their immediate regional basis of sustainability, but that they appropriate carrying capacity from distant lands while exporting ecological degradation.

Notably, Rees and Wackernagel were initially indexing this inversion of carrying capacity through the term “regional capsule,” conceiving of a kind of glass bubble or hemisphere that enclosed a given urban area and considering how big that glass bubble would have to be to support a given regional human population within it (the inspiration they cite for this metaphor is the failed “Biosphere II” project in Arizona that attempted to recreate an (en)closed self-supporting ecosystem like the Earth) (1996, 9). In a moment that Rees recalls as an “epiphany” (or what studies of metaphor might connect to the filling of a “semantic gap” that occurs at the site of emerging metaphors), he swapped in the metaphor of the footprint, as an indicator of land surface area. When Rees was given a new tower computer in his office, a colleague asked him how he liked it and he responded (no doubt influenced by his epistemological background in sustainability and land use) “I especially like it because of the small footprint” (2008). The footprint metaphor resonated with the work he was doing with Wackernagel so they removed the references to the “regional capsule” as an index and substituted the ecological footprint as “an *accounting tool* that enables us to estimate the resource consumption and waste

assimilation requirements of a defined human population or economy in terms of a corresponding productive land area [my emphasis]” (1996, 9). Although Rees himself acknowledges that the metaphor has been “powerfully evocative” and partly responsible for the success of the ecological footprint concept he does not delve any deeper into the power of ecological metaphors more generally (2006, 149); the ecological footprint remains widely understood as an accounting tool, in the instrumental terms of its founders.⁶⁹ The carbon footprint metaphor also tends to be read as an empirical measure, although close analysis of its uses and appearances in the following analysis reveals that its metaphoricity is productive of numerous cultural, ideological and affective effects.

The notion of the ecological footprint received significant attention within specific circles of interest in the years immediately following the release of the book, *Our Ecological Footprint* (1996), and it continues to gain currency in certain organizational ecological governance circles, but it did not take imaginative hold in certain everyday public spaces the way the carbon footprint would.⁷⁰ In fact, it still is not as prevalent as the carbon footprint, within most public contexts in North America.⁷¹ The reasons for the dominance of the later metaphor pertain in part to the emergence of climate change as a planetary matter of concern, and also to the singular capacity of carbon footprints to traffic among so many different agendas, especially marketizing ones (as elaborated in all the following chapters of analysis). Both elements of this compound metaphor – carbon and footprint – themselves shift between literal and metaphorical senses; as Rees understood intuitively, the footprint is a powerful metaphorical frame for the ecological footprint metric by virtue of its associations with measured space in land use as well its associations with grounded ecologies and evocative humanist imaginaries.

Although the quantitative measuring of a carbon footprint is accomplished through weight (tons of carbon dioxide equivalents) rather than by geophysical space (hectares), as with the ecological footprint, the metaphor of the footprint functions to create an imaginative space, or opening that shifts between a literal measurable entity and a metaphorical quality. This metaphor then, makes use of the two kinds of associations mentioned in the dictionary for this word: the land area; and the (environmental) impact. As studies of metaphor attest, the relationship between the literal and the metaphorical is not as tidy an opposition as one might think (Radman 1997; Franke 2000); indeed, as William Franke evocatively asserts, the *literal itself is figured* by the image of the written letter (2000, 140).⁷² The ‘footprint’ is exemplary of this paradoxical relationship between the literal and the metaphor. As the image and quotations at the beginning of this study suggest, the carbon footprint’s diverse textual iterations reveal a heterogeneous field of possible interpretations and practices. While there may exist a strong visual connection between the literal footprint, as a geophysical imprint and environmental (carbon) impact of activities and habits measured by carbon footprint indices, a whole range of other activities – including purchasing consumer goods or offsets – also get figured through carbon footprint metaphors. The “letter” or sign of the impactful footprint is read and deployed in multiple ways with unlikely alliances.

The human footprint also figures prominently within cultural imaginaries and codes of ethics for Western public encounters in “wilderness;” these imaginaries become complexly entangled with carbon footprint metaphors, sometimes reifying problematic humanisms, but also at times challenging them. *Leave nothing but a footprint* is a well-known camping expression, used by twentieth century scouting organizations (Guides,

Scouts, etc) and campers more generally, and recently, it also appears as an associate of carbon footprint metaphors in certain instances (McClung 2008; Energy Results 2011; Ramirez 2013). The *leave nothing but a footprint* edict gestures at a kind of camping/hiking ethics that prohibits damaging ‘natural’ spaces and especially draws attention to the potential for visible human detritus to contaminate what is usually thought of as a pristine wilderness environment. No doubt the footprint in the original ‘camp-out’ expression makes strong reference to a literal and physical footprint – a geophysical marker of a former presence (and, as Derridean philosophy suggests, an *absence*, as described above) - that is thought to be the only impact permitted/unavoidable in the instance of camping or hiking in “the wilderness;” however, the expression carries a metaphoric meaning as well. Here, the literal geophysical mark and the absence of other common artefacts of human consumption (bottles, cans etc) may carry over a range of associated practices of a “responsible” camper. If we look more deeply at what is thought to be the origin of this phrase, these metaphoric circuits appear more clearly. “*Take only memories. Leave nothing but a footprint,*”⁷³ beyond a camp-out ethic in the wilderness, may also suggest ways of being in the world that are more generalizable to an ethics *against* taking from, or adversely impacting ecosystems (though as this study demonstrates, this is a latent potential conditioned by historical and cultural contexts and associations).

What is notable is that the footprint in this instance attaches a strong visual reference to a literal footprint, but also evokes a footprint metaphorically as a *positive* environmental legacy, one that might be unusual or at least anomalous in Western cultures where ephemerality and ‘lightness’ of impacts do not generally figure

prominently. The legacies of human built environments are dependent upon an everyday economy of resource extraction and leaving big imprints. From this angle, the *leave only footprints* ethic seems highly fraught in that it fails to acknowledge the many ways in which the “everyday” non-camping lifestyles of Western privileged subjects also severely impact ecosystems. Crucially, however, one cannot simply dismiss all carbon footprint metaphors as complicit with this logic of reinforcing the lifestyles of western privileged subjects. Many of the instances of the carbon footprint metaphor that draw an initial connection to the ‘leave nothing but a footprint’ expression, clearly appealing to such Western privileged subjects, also then mobilize the carbon footprint to problematize the notion that one can ever leave simply a ‘footprint’ as a geophysical mark when lifestyle and habits are concerned (McClung 2008; Energy Results 2011; Ramirez 2013).

Paradoxically, then, the affective appeal to this *leave nothing but a footprint* discourse might shape how carbon footprint metaphors function to instantiate this very Western liberal subject at the core of individualist solutions to climate change as I describe them in Chapter Three, but the trope of the footprint also turns critically on these very subjects to bring into visibility problematic lifestyles:

While making visits to national parks or forest preserves, you’ll often be told to “leave nothing but footprints.” This is always a good policy in these types of situations. However, we often forget, or simply do not know that wherever we go, we actually leave two sets of footprints. Your physical footprint is, for the most part, a harmless indentation left behind wherever you step. Your other footprint is what is known as your carbon footprint, essentially the level of greenhouse gases your lifestyle and activity emit into the environment. (Energy Results 2011; Ramirez 2013)⁷⁴

This metaphoric shift significantly initiates movement from thinking about visible physical impressions that are unavoidable to countless other everyday impacts that involve lifestyles that involve *some* degree of choice (although, as elaborated in Chapter

Three, problems arise in the foisting of all of this responsibility onto individual bodies when larger systems are involved). These complexities of associations with and of footprints situate carbon footprint metaphors within a complex and tension-ridden politics of ecological relations.

While footprints can inscribe particularly problematic humanisms, as described above, they are also, paradoxically, particularly ripe for conceiving of larger-than-human relational encounters in material ecologies. Adrienne Mayor and William Sarjeant suggest “fossil footprints were recognized as traces of living creatures long before petrified bones were perceived as being organic remains” (2001, 143). Such creatures traced through footprints ranged from dinosaurs to oxen to birds to humans and even mythical creatures such as dragons (ibid., 149-152). Although the footprints in question were still being ‘read’ by early *humans*, their existence and the powerful force they carried did not refer uniquely to humans. Owing to the fact that literal footprints may suggest an impression of an ecological actor in a certain space and time, they offer the unique capacity of tracing forms of presence that are not uniquely human. Tracing carbon footprints in texts suggests that this this capacity connected to “literal” footprints also extends to the metaphoricity of the footprint as an opening for more-than-human agency. Certain instances of this metaphor, like the “carbon footprint of shrimp” (Chapter Five) more explicitly trace the presence of ecological actors that are larger-than-human.

Relatedly, the footprint may tell a story not only of an ecological actor leaving an impression, but of a reciprocity of impression-making whereby what is often discursively neutered through the word “surface” or “environment” comes to actively participate in the footprint-making process. An impression made in the sand by a walking animal

(human or otherwise), for example, presents itself through its mutual constitution with its surrounding relations with sand, water and a host of other actors in place. How deep the impression and how long it lasts are subject not only to the weight of the footprint-maker but also to the characteristics – permeability, porosity, solidity, etc – of the relational actors that are co-constituted within the footprint. Many of the footprints of early creatures have recently been located because they were initially made in impressionable volcanic ash that has since become petrified (Mayor and Sarjeant, 2001). These properties of the footprint lend to its place as an elemental figure for mediating larger-than-human vital relations. When the footprint not only implies a single actor but is multiplied to the level of a species and beyond at a time of climate change, this metaphor figures existential questions and shifting consciousness that potentially impart new accounts of human and larger-than-human conditions. A footprint may not just be a ‘surface effect’ of what we humans can see with our partial vision, but something much more profound; considering footprints in mangroves ecosystems (Chapter Five), for example, initiates a deeper appreciation for, and humility toward vital relations and processes that we cannot immediately see.

While the above gesture at the imaginaries, politics and affects involving “carbon” and “footprints” is by no means exhaustive,⁷⁵ what is evident is that each of these two elements is at play in ambivalent cultural and material histories. Carbon is both value-laden as ‘good’ as a foundational element to life on Earth, *and* troubling as the stand-in for greenhouse gas-inducing climate change that threatens life as we know it. Footprints can be both problematic *and* comforting, and further, they can both inscribe problematic humanisms *and* trace larger-than-human impressions. Footprints can be

tracked for instrumental purposes and capture of the “objects” they signify or they can be traced as an affective blurring of subjects and objects in relational trajectories. These tensions and paradoxes of carbon and footprint significantly shape their compounded forms in carbon footprint metaphors. What I describe as the “promises” and “risks” of carbon footprint metaphors pertain to the particular associations and processes they make visible and the actions they foster as “affective mediators.”

Mise-en-Scène: Metaphor, Affect, Politics, Ecology

In the analysis that follows, I situate carbon footprint metaphors as “affective mediators” in the cultural politics of climate change. I take the notion of mediator from discourse and communications studies which insist that the mediations of language (here metaphor) are never neutral, but are recursively involved in the formation of worlds (Dryzek 2005; Fairclough 2001). This active notion of mediation renders visible a politics constituted within and through language rather than simply reading language as an instrumental tool. I also wish to build on popular notions of mediation as an active process of opening dialogue in dispute or struggles, although as I illustrate through the cases of carbon footprint metaphors, there is a politics involved in keeping these struggles open rather than aiming for dispute “resolution.” By resisting the totalizing imperative to ultimately “resolve” the specifics of the who/what/how that are indexed through the carbon footprint metaphor, one might gesture toward a different orientation of mediation whereby larger-than-human actors may register in iterative processes. The affective forces and processes that come together within each instance of the carbon footprint metaphor reveal specific ways of perceiving the issue of climate change and how to address it. A certain tendency exists to mobilize such affective forces instrumentally towards specific human-centric

solutions; as I draw out below, this tendency is equally “affectively mediated” by carbon footprint metaphors. And yet, by acknowledging that these metaphors are involved in mediating processes that involve larger-than-human relationalities, one can also affirm a role for this metaphor as affectively mediating larger-than-human forces. As my final case study suggests, understanding larger-than-human relations requires un-packing highly specific interactions, rather than simply re-inscribing a human/non-human binary or universalizing what “larger-than-human” might mean in a totalizing way that erases differences. Understanding the “carbon footprint of shrimp” in Chapter Five, for example, entails bringing into visibility a *connecting thread of experience* that links local and global populations, shrimp, mangrove roots, and many other actors within and beyond a social and material network of mangrove ecosystems in Southeast Asia. The benefit of drawing on the affect theories and political theories that I do below is that they do not insist on prescribing a specific ontology of the body or of political actors that might come to count through this metaphor. The interacting terms of mediation that I have begun to tease out thus far are metaphor, affect, politics and ecology. I will bring these more explicitly into play below.

Theories of metaphor and theories of affect that explicitly engage with political questions share many traits, not least of which are how they insist that each – metaphor and affect – function politically through 1) binding entities/bodies together in contingent linkages; and 2) movement. From the perspective of metaphor studies, acknowledging that both “carbon” and “footprint” carry histories of cultural meaning and exert their own metaphorical force suggests that the compound metaphor is caught up within metaphorical relations that bind to create resemblances or yoke together distinct entities

with profoundly political effects. As the cultural case studies that follow suggest, the meanings shift as carbon footprint metaphors turn towards or bind with different entities. Different worlds may come into visibility through each of this metaphor's diverse iterations. For metaphor studies scholar, Dennis Sobolev, "the question is not whether the terms of a given metaphor are similar (they are in one sense or the other), but whether this similarity plays a central role in the production of meaning" (2008, 909). This creation of resemblance then, is key to metaphor; however, paradoxically, the relationship is dependent upon dissonance and contradiction. The fact that metaphors are generally not easily paraphraseable, suggests that they initiate a relationship between entities that are in some kind of contradictory relationship. As Paul Ricouer suggests, "the interplay of resemblance...consists in the initiation of a *proximity* between formerly 'remote' meanings" (1977, 230). This is the process whereby 'carbon' (as a stand-in for all greenhouse gases) comes to be seen as having a 'footprint' despite the initial dissonance generated by bringing these two entities together.

Generating proximities between meanings is not just a matter of semantics as a representational act, but an act of political world-creation. This is the site of what William Franke calls the "uncanny onto-linguistic power" of metaphor (2000, 143). Metaphors help bring worlds into being through fostering attachments and creating/reinforcing cartographies of what is visible. As Paul Chilton elaborates, security metaphors circulating around the time of the "Cold War" did more than just name or represent an existing geo-political situation; discursive analysis of key policy and public texts reveals that these metaphors helped to draw the maps of the visible geo-political world as a "house divided," thereby both playing into material realities of tensions

between Western Bloc and Eastern Bloc countries, and also significantly shaping them (1996). Similarly, carbon footprint metaphors not only describe/ represent the climate change impacts as their definitions suggest; they function to shape how to view these impacts in the world and, crucially, what to do about them in diverse and complex ways. This force is called an “onto-linguistic power” in Franke’s words because it involves not only reinforcing existing worlds, but creating new ones. Metaphor encompasses a:

...dynamic capability of bringing absolutely new possibilities of significance – and even the possibility of sense itself – into existence. The metaphorical significances thus created would be not just variations on literal significances but absolute metaphorical creations of significance that set teetering all previously established, presumably stable, literal meanings and even beings. (Franke 2000, 144)

Franke’s formulation is suggestive of an understanding of metaphor not as a signifying power, but as an affective one that isn’t necessarily attached to, or instrumentally wielded exclusively by human subjects. Extended to the cultural politics of climate change, this power is evocative: might not metaphors that attempt to account for ecological relations vis-à-vis carbon offer the potential to “set teetering” the stability of representational accounts that feature in these politics? Might they shift the terms of who appears in these politics in terms of differentially-conceived human actors and, if we acknowledge their metaphorical force, might these metaphors even shift the terms of “beings” that count in these politics beyond the exclusively ‘human’? The affective mediations of carbon footprint metaphors would suggest that we might keep attuned to this promise, even as we critically examine the attendant risks of these metaphors in their reification of both geo-politically asymmetrical human relations and human-centric fossil fuel dependent systems. If metaphor, like affect, as I describe it below, bears a “thoroughly immanent

neutrality” (Seigworth and Gregg 2010, 10), such neutrality does not render metaphor politically neutral. Understanding this metaphor as an affective mediator entails a “generative pedagogic nudge aimed at a body’s becoming an ever more worldly sensitive interface, toward a style of being present to the struggles of our time” (Seigworth and Gregg 2010, 12).

While theories about metaphor and theories about affect overlap in many respects, some distinctions must be made in order to understand how affect theory contributes to my analysis of metaphors as mediators of affect. As mentioned in the previous chapter, my approach to affect, following a combination of affect theorists in the ‘vitalist’ tradition (Bennett 2010; Massumi 2002) and those in the tradition of analyzing affective relations in texts and discourse (Ahmed 2004; Ngai 2005; Woodward 2009), is to insist that a politics of affect might encompass, but not be reducible to, emotion or something captured in discourse. Understanding the complex mediations of carbon footprint metaphors entails attention to both linguistically (metaphorically) rendered human subject-centric affects/feelings (like guilt) and to those affects, still metaphorically mediated, that are less capable of being pinned to definitive personalized and human subject-centred circuits. The reduction of affect to an exclusively human-subject centred emotion (like guilt) signals one of the risks of the carbon footprint, for as I describe in my analysis, the politics that ensue are shaped by certain problematic liberal human subject-centred concerns. Whereas when the metaphor functions as an opening or threshold onto affect in the vitalist or Spinozian sense, it is arguably most politically promising in its capacity to figure larger-than-human relations that orient responses. From this branch of affect theory, Brian Massumi suggests that affect gestures at a “*connecting thread of*

experience” that runs prior to, throughout, and after the “sociolinguistic fixing of quality or experience which is from that point onward defined as personal” (Massumi 1995, 88). Whereas emotions are captured linguistically and may follow conventional “narrativizable action-reaction circuits,” affect is something less deterministic for Massumi (2002, 28). I concur with Massumi on the need to understand affect as encompassing more than emotion as it is captured in language, especially in the cultural politics of climate change where human language (and also emotion) must always be read as partial in its re-presentations of larger-than-human worlds. As I described in Chapter One, affect, formulated as “intensities” in this Spinozist tradition, is considered a vital force that exceeds human subjects and is immanent to *every* body, including the non-human.

The role of what has been called “weather” as a political force of relations and processes is one example of a politics of affect that is not easily rendered in language. The force of ‘weather’ or ‘meteorological events’ is difficult to capture because weather is not directly correlatable to climate change, and so to even begin to talk about this relationship requires a difficult discursive dance between a scientific logic of knowable causation along with the principle of uncertainty symptomatic of the abstraction of climate change as statistic. This dance is situated within a cultural politics of climate change that seems to demand indisputable scientific proof ‘translated’ into public discourse in order to justify making the significant socio-ecological transitions that are called for. Rendering these paradoxes linguistically seems an impossible task; and yet, as those who are savvy to cultural politics of climate change will attest, “weather” does exert a profound force or intensity within the politics of climate change. (Boykoff 2011;

Hulme 2009; Weaver 2008).⁷⁶ This is but one example of the many important larger-than-human sets of force relations that get short shrift in the politics of climate change. While humans cannot specifically account for or count on the trajectories of such larger-than-human force relations, we can orient ourselves to anticipate and make room for these relations to appear to disturb our representations. This is one key example of the importance of bringing a politics of affect into conversation with climate change which pushes on the limits of what have been understood as human systems, including the system of “representational” language.

With Woodward, however, I do not dismiss the importance of linguistically-rendered feelings or emotions as potential sites of analysis since as she states, “we live in a mixed economy of feelings, one characterized by both the psychological emotions and intensities, and my point is that they often stand in a dialectical relationship to each other, with the narrative of our experience a crucial capacity” (Woodward 2009, 25).⁷⁷ These two positions on affect, expressed by Woodward and Massumi, inform two aspects of my hybrid reading of affect.

First, with Woodward, Sarah Ahmed, Sianne Ngai and others who follow a discursive approach to understanding affect, I contend that narratives of experience, which are inescapably linguistically-rendered,⁷⁸ do offer crucial insights in understanding a politics of affect. Many political affects are undeniably created and mediated within and through language. Sarah Ahmed illustrates how affect pulls the bodies of ‘white’ subjects together into British nationhood and away from immigrant/refugee ‘outsiders’ who are seen as making injurious claims upon the nation for support; understanding these politics of affect entails understanding discursive circuits of ‘hate’ which appear in the media,

and in other public texts (2004). Ahmed considers “the role of hate in shaping bodies and works through the way hate generates its object as a defence against injury” (42). Ahmed’s work informs my method of understanding texts as affective “contact zones” for critical analysis as described below. In order to understand the affective work of carbon footprint metaphors, I explore how critically understanding certain socio-linguistically captured feelings such as individual subject-centred “carbon guilt” allows for the narration of the appearance of certain bodies and worlds and the disappearance of others. Such an analysis brings into visibility this metaphor’s complicity in bringing fraught solutions to climate change which rely on a reduced or captured interpretation of the issue and reproduce a liberal order of environmentalism which leaves intact global asymmetries and fossil fuel intensive systems. In Chapter Four, I explore what I call “carbon fellowship” to trace citizen-oriented feelings affectively mobilized through carbon footprint metaphors; while in some instances such affects draw together and make visible differentially responsible and impacted human bodies, other examples of this fellowship brought about through carbon footprint metaphors connect nation-bound citizens into affective relations and processes that both distance global others, and insist that support for carbon-intensive resource extraction is a key condition of being a “good” citizen.

The second aspect of my interpretation of affect aligns more closely with the vitalist branch of affect theory which centrally recognizes the limits of discursively-rendered affects as outlined above in the words of Massumi. Affect, he suggests can be something less determinate than what can be captured in language; thus attending to affect might entail what Jane Bennett describes as the impossible task of “giv[ing] voice

to a vitality intrinsic to materiality” (2010, 30). Tracing such a vitality of ecological materiality is especially essential for understanding relations in the politics of climate change which inescapably and centrally entails larger-than-human circuits (as opposed to the *human* social circuits of hate that Sarah Ahmed traces). Paradoxically then, I make sense of these vital connections and processes through language (as do affect theorists), but through an explicitly metaphorical language that suspends the representational logic and mastery of human representation. Gesturing toward “pre-personal intensities” (Deleuze and Guattari 1987) or circuits of associations and moving processes is an especially necessary move in attending to larger-than-human relations that exert force in the matter of climate change. I elaborate on the possibilities of the affective force of what I call “carbon vitality,” following Bennett and Connolly on vitality as a necessary antidote to human-centric rationality and instrumentalism. This metaphorically-rendered affect is only partially captured, but remains deliberately fuzzy as a notion in order to account for moving relations and processes. Affect does not entail the “generic figuring of ‘the body’ (*any* body) but, much more singularly, endeavoring to configure *a* body and its affects/affectedness, its ongoing affectual composition of a world, the *this-ness* of a world and a body” (Seigworth and Gregg 2010, 3). Rather than generically configuring *the* carbon footprint metaphor, I am interested in teasing out certain specific affective relations brought into political visibility through diverse instances of carbon footprint metaphors in their worldly compositions. Again keeping in mind that affect plays to no particular agenda, but “bears an intense and thoroughly immanent neutrality” (ibid., 10), it is important to trace the affects of these particular instances of carbon footprint metaphors that offer both promises and risks (with both promises and risks often

emerging from the same instance or text as it moves and shifts to connect to different worlds). Carbon footprint metaphors act in part through this interplay of: semiotic capture of effects and affects by connecting footprints of specific bodies (be they individual, national, human, non-human) to a planetary carbon calculus that is associated with other bodies (for instance, carbon markets, but crucially, not only these); and the movement beyond such affects towards other bodies not yet accounted for.

To bring metaphor and affect into conversation is to begin by understanding paradoxically, that affect is involved in language, but it is also constrained by language because language involves a (contingent) closure to create meaning and to represent, while affect encompasses more than what can be captured by language. Metaphor, as a linguistic entity that has only a tenuous claim on representation (*if* it is recognized as metaphor), keeps this place of contingency even more open and thus, might be thought of as more susceptible to affective forces and movements. To return to the words of William Franke, the force of metaphor offers the potential to “set teetering all previously established, presumably stable, literal meanings and even *beings* (2000, 144) (emphasis added). This teetering away from stable meanings and beings enables metaphor to bring into visibility affective relations in larger-than-human circuits of being. A ‘connecting thread of experience’ that has yet been unuttered or sensed may thereby be carried over by metaphor as metaphor plays a “key role in expressing what exceeds conceptualization altogether” (ibid., 147). While the carbon footprint metaphor in many contexts tends toward a literal meaning/interpretation, as a metaphor it remains affectively charged by the excesses that continue to escape its conceptualization or literalization. This metaphor moves toward the edges of existing articulations of the world and beyond the actor-

beings that are already represented in its calculus. This creative power of metaphor draws these connecting threads into a politics of affect. Metaphor, then, as an entity that suspends the referential function of language (Ricouer 1975, 224-225), has a special role to play in the affective politics of climate change.

Because metaphors are tropes that turn, analysis requires attending to the particularities of each textual instance of the carbon footprint metaphor rather than asserting their definitive function; however neither are these metaphors entirely free-floating signifiers as their *onto-linguistic power* comes into play with past histories of association that shape the possible worlds they can make. I draw attention to certain tendencies and ‘naturalized’ associations that cut across many instances of the carbon footprint; these tendencies come from the past histories of association and norms that I have described within the cultural politics of climate change in Chapter One. On the risky side are certain anthropocentric forces of managerial control that attempt to discipline carbon footprint metaphors into acting as if they are linguistic representations of stable accounting tools. The carbon footprint metaphor is often taken as a linguistic representation of a calculus of carbon, or quantifying metric of carbon. Removed from its explicit metaphoricity, the affective mediations seemed constrained by human instrumental reason. As my analysis emphasizes, such forces tend to pull the footprint metaphor towards certain human-centric managerial solutions to climate change; these metaphors then often get caught up in liberal environmental norms of carbon commodification as the pre-condition of any climate change solutions. On the promising side, however, carbon footprint metaphors as mediators of relations and processes that always exceed such norms, also offer the opportunity of bringing larger-than-human

relations and processes into political visibility to interrupt certain illusions of human mastery.

Because carbon footprints as metaphors linger in the zone of what Jacques Rancière calls “literary locutions and political statements,” their world-creating power to map political responses suggests a return to Rancière’s politics of aesthetics (2004, 39). The politics of Rancièrian aesthetics is intimately suggestive of the movements of affective intensities as they shape actors and capacities to act, especially in terms of ecological politics (Bennett 2010, 104-107). Who comes to appear as an active political actor through carbon footprint metaphors, and who does not evokes what Rancière’ signifies as “la partition du sensible” (the distribution of the sensible) (2004).⁷⁹ This framework describes “the system of self-evident facts of sense perception that simultaneously discloses the existence of something in common and the delimitations that define the respective parts and positions within it” (ibid., 12). The “something in common” that is described by this distribution is nothing less than a particular world order that prescribes the actors, roles, ways of acting and the relations between these.

Rancière’s critical illustration of the distribution of the sensible begins with Aristotle’s notion of the speaking citizen who takes part in politics. “Aristotle states that a citizen is someone who has a part in the act of governing and being governed. However, another form of distribution precedes this act of partaking in government: the distribution that determines those who have a part in the community of citizens” (ibid.). For Rancière, although Aristotle’s elaboration of all citizens’ rights to participate in governance seems an inclusionary principle enabling democratic engagement, a prior partitioning out of the voiceless (‘slaves,’ artists, women, etc.) that undergirds the notion of citizen

consequentially shapes public engagement. Rancière's gestures reveal that even in those institutions that claim to be democratic, certain dispositions are already written into these institutions (who can participate and how) such that exclusions are made. In other words, this system provides a kind of "map" or shared way of seeing the world or a particular part of it. The notion of 'partition' also signals interplay between the normative system as it paradoxically *permits* the participation of those who register within it by being heard or seen within this system, just as it *bars* from participation those who do not register:

This partition should be understood in the double sense of the word: on the one hand, as that which separates and excludes; on the other, as that which allows participation. A partition of the sensible refers to the manner in which a shared common (*un commun partagé*) and the distribution of part and shares (*parties*), itself presupposes a distribution of what is visible and what not, of what can be heard and what cannot. (Rancière 2010, 36)

The partition of the sensible is alternately translated from French into English as either "partition of the sensible" or "distribution of the sensible" since the notion of partition in French connotes both: "partition" as a walling off or separation, *and* "distribution" in the sense of sharing out (*partager*) or distributing among participants. For the sake of consistency and because of its possible resonances with distributed networks of sentience/affect that are larger-than-human, I favour the use of "distribution of the sensible" to signal this political relation; however, I linger on the above quotation momentarily to tease out what might get lost in translation with the loss of the notion of partition. The *partition* of the sensible as outlined in the above translation both functions to exclude and provides the terms of political engagement. A partition is no doubt meant to exclude, but it is premised upon the notion of introducing an artificial barrier that did not exist; partition in this phrase signals that something has already been constructed or

composed, and thus, that it may be subject to forces that un-do/re-work it. In other words, as Rancière notes, a partition requires boundary control that is bound to be thwarted from time to time because its very existence suggests forces that exceed it, forces that cannot be contained. “The whole democratic process is about the displacement of that boundary” (2010, 58). Thus paradoxically, the existing partition of the sensible sets up the conditions for its own displacement. This movement towards a not-yet (not ever completely) achieved inclusion of all is “politics” for Rancière. “*Politics* means the supplementation of all qualifications by the power of the unqualified” (ibid., 58). I will extend the notion of the supplemental power further below as I position the carbon footprint metaphor within this interplay of closing off of, and opening up to supplemental political-ecological actors that exceed the given account of carbon footprints.

There is a limit to the metaphor of a walled-off partition when extended into too ‘literal’ an interpretation of a wall in English because it forecloses upon the other important aspects of “la partition”/distribution as in “sharing out;” this second aspect of Rancière’s notion is equally important. In order to get a share of something, to participate in the distribution, a participant must *appear* and this involves what Rancière suggests is an “aesthetics at the core of politics that has nothing to do with...the perverse commandeering of politics by a will to art, by consideration of the people qua work of art” (2000/2004, 13). Rather aesthetics for Rancière is “the system of *a priori* forms determining what presents itself to sense experience” (Ibid). What or who appears as present to sense experience in this system is not based on “self-evident facts,” but a world-making aesthetics; Rancière thereby returns the element of “construction of common objects” that is at play in politics (2009, 72). In other words, a normative

distribution of the sensible involves a kind of authoritative *putting into place* of qualified actors attributed with certain roles. These givens and proper roles, taken as shared ways of seeing or sensing the world, establish a normative distribution of the sensible with built-in exclusions; such exclusions are, in fact composed aesthetically by “delimiting the sphere of the political...shrinking the political stage” and through “a ‘purification’ of politics” that results in the “eviction” of those deemed inadmissible (2010, 54). For Rancière, however, politics cannot ultimately be so neatly purified because the active presence of those excluded inevitably challenges and displaces the boundaries drawn.

Carbon footprint metaphors are integrally woven into these political relations of foreclosures and openings described by Rancière as they:

...can be implemented in opposite ways depending on the sense of the ‘common’ in which they are framed. They can circumscribe the sphere of the political and restrict political agency to an activity performed by definite agents endowed with the appropriate qualification; or they can give way to forms of interpretation and practice that are democratic, which invent new political places, issues and agents from the very same texts. (Rancière 2010, 54)

The movement of carbon footprint metaphors sets in motion “another setting of the stage, producing different relations between words, the kinds of thing that they designate and the kinds of practices they empower” (ibid., 54). In Chapter Three, for example, I analyze carbon footprint reduction lists as mechanisms through which “carbon subjects” (largely western privileged humanist individuals) are hailed into specific modes of action within the cultural politics of climate change. While this call to certain subjects through the carbon footprint metaphor offers the promise of having these subjects *appear* to take responsibility for their disproportionate role in contributing to climate change, the call also in part reinforces a normative distribution of the sensible in which individualist and

consumer-based solutions to climate change prevail. This normative distribution of the sensible prescribes roles and relationships for certain actors who have carbon footprints, but leaves many other actions and crucially, other human and non-human actors out of the (ac)count.

For Rancière, this existing normative distribution of the sensible does not shut down politics, which is an inherently disruptive process; a supplementary power (in his problematic terms, “power of the people”) in excess of the normative distribution always comes to challenge the givens. Politics then, hinges on a form of perpetual democratic movement that incites iterative emergence of “the part of those who have no part” (2010, 70). Picking up on Derrida’s notion of a “democracy to come,” and with latent resonances with Emmanuel Levinas’ notion of “infinity” as an ethical space of radical alterity (Levinas 1969),⁸⁰ Rancière suggests that the essence of politics is “an infinite openness to that which comes – which also means, an infinite openness to the other or the newcomer” (2010, 59). Because carbon footprint metaphors are involved in the inherently disruptive processes of politics and ecologies through which previously unaccounted actors appear, certain carbon footprint metaphors can be seen as enacting novel distributions of the sensible or *re-distributing the sensible* such that ‘newcomers’ appear. With the help of Rancière’s thought, I theorize a means of accounting for the ways in which carbon footprint metaphors become yoked to certain practices and mechanisms in the cultural politics of climate change and the ways in which they also potentially disturb these practices through new attachments. That is to say that these metaphors are involved in both processes of reifying normative distributions of the sensible and processes of un-doing these very distributions as new actors emerge to

challenge the givens of the metaphor as it is understood. This is the interplay of what I identify as the “risks” and “promises” of this metaphor; thus, in my analysis of this ambivalence, I lead each chapter with the promises offered through a certain case of carbon footprint metaphors which creates an opening for “newcomers,” but I then turn to the risks associated with the same case differently inflected or contextualized with different attachments such that exclusions are made and promises shut down.

Using Rancière’s thought in this way, however, is not without its complications. Indeed, ecological metaphors animate Rancière’s distribution of the sensible in particular ways that expose the limits of his own humanist assumptions within a notion that never reaches beyond the human at the centre of his elaboration of politics. Reading Rancière within and against himself entails understanding the ways in which he exerts his own form of boundary control by “delimiting the sphere of the political” (54) to the human species – the *power of the people*. Nonetheless, his thought remains ripe for opening up his own boundaries (with the help of Bruno Latour and Jane Bennett below). My claim is that carbon footprint metaphors act in this way as (co-)constituted elements of cultural politics of climate change. These metaphors risk delimiting the sphere of politics to specifically fraught human systems and agents who ‘qualify,’ thereby foreclosing upon political participation; however, as my analysis highlights, these same metaphors (though in different contexts with different co-constituents) also offer the promise of new interpretations, agents and politics.

I am cross-pollinating the work of Rancière with that of Jane Bennett and Bruno Latour despite their significant differences. I am re-contextualizing *ecological* actors that emerge through carbon footprint metaphors within a Rancièrian play of emerging

political actors via Latour and Bennett who insist on an explicit place for non-human actors against what Bennett calls Rancière's own "prejudice:"

Though Rancière objects to the "Platonic" prejudice against the demos, which positions commoners as defective versions of men in possession of logos, to imagine politics as a realm of human activity alone may also be a kind of prejudice: a prejudice against a (nonhuman) multitude misrecognized as context, constraint or tool. (Bennett 2010, 108)

When Jane Bennett explicitly asked of Rancière in a face-to-face encounter "whether he thought that an animal or a plant or a drug or a (nonlinguistic) sound could disrupt the police order" (another phrase he uses for the normative distribution of the sensible), his answer was 'no' (Bennett 2010, 106). Nonetheless, Bennett insists that Rancière's own theory of how politics entails disturbance from forces that are "irreducible to the particular bodies" that fall within the existing order, "invokes flow through nonhuman bodies" (ibid.). "Rancière implicitly raises this question: Is the power to disrupt really limited to human speakers?" (ibid.). Jane Bennett's quest to sense the politics of a "vital materiality" in the world thus entails taking Rancière seriously beyond his own limits.

Latour also makes important claims about the role for non-human actors in what he calls a "progressive composition of the common world" (ibid., 86; 247). Reminiscent of Rancière's theorization of distribution of the sensible and the appearance of "the part that has had no part," Latour insists that a composition of a common world explicitly entails iterative acts of emergence of actors that come to challenge a given order in the world. Latour's term for this order, "collective" re-calls Rancière's distribution of the sensible, with the agencies involved in disturbing this order not strictly limited to "the power of the people" but those associations of larger-than-human actors that come to challenge the always exclusionary collective as it exists. A collective similarly evokes an

active process of bringing together bodies; such a process might aim at inclusion, but it also features exclusions that appear in the form of political provocations from actors that emerge. “Actors are defined above all as obstacles, scandals, as what suspends mastery, as what gets in the way of domination, as what interrupts the closure and the composition of the collective” (2004, 81). Latour’s is not a teleological progression where one ultimately reaches the goal of having composed the world, but a messy process which permits only contingent and partial closures in order to reach certain political decisions that must be reached, only to be opened up again in follow-up accounts, in a constant groping for a “sense of the common” that escapes (human) mastery (ibid., 182). Built into Latour’s agenda is a process of assembling a collectivity of actors involved in a “matter of concern,” as opposed to a battle between matters of “fact” versus “values” (ibid., 22-23). Although assembling the voices of the human and non-human actors involved in any proposition involving climate change is a complex and “perplexing” process (104), arguably, this process of slowing down and entertaining the presence of diverse actors is one that would inform an intervention in the cultural politics of climate change.

In my own *mise-en-scène*, carbon footprint metaphors are cast as potential parts in this process of iteratively adding actors who come to challenge a given order in a collective or in Rancière’s terms, “distribution of the sensible.” My analysis elaborates on how this process may be mediated through metaphor and I will return more explicitly to these themes in Chapter Five and in the conclusion. As mentioned at the outset, however, this is not the only way in which carbon footprint metaphors are put into play; understanding the various roles this metaphor plays is central to my critical analysis.

While Latour and Bennett do insist on elaborating a role for larger-than-human actors that emerge to challenge a given political order, they do not permit an explicit role for metaphors or aesthetics in their accounts as does Rancière; therefore, my cross-pollination of Rancière, Bennett and Latour permits each to supplement the others as a way of making room for both aesthetics and larger-than-human affects as necessary in my approach to unpacking the promises and risks of carbon footprint metaphors in the cultural politics of climate change. If Rancière's theorization of the distribution of the sensible is meant to gesture at the aesthetic order at the heart of all politics, it is also simultaneously aimed at addressing and re-connecting the fundamental split dividing aesthetics and politics that began with Plato and Aristotle and still today effects a partitioning of what is thought proper to aesthetics and politics, seen as independent spheres. This rift parallels the way in which Aristotle, in his trademark taxonomic logic, launched a legacy of *putting metaphor in its place* by presenting a certain regime of intelligibility or a normative distribution of the sensible that metaphor has always exceeded.⁸¹ Since Aristotle's definitions of metaphor in *Rhetorics* and *Poetics*, metaphor has conventionally been cast within political thought as literary frill, or at worse, in the political philosophy of Thomas Hobbes (whose own theorizations of the *leviathan* and the *body politic* are unabashedly metaphorical), an "absurdity" or "danger" to be avoided at all costs (1651/1891). The tendency has been for *The Poetics* to have informed an evolving literary studies, and *The Rhetorics* to have been marginalized within the study of politics and philosophy. This conventionalized dismissal of a political place for aesthetics is, as mentioned above, carried over by Bruno Latour, who outlines the important occupations of scientists, economists and politicians in his *Politics of Nature*; these

prescribed actors and roles can be read as a profound distribution of the sensible of a rational “politics of nature” at work in which aesthetic compositions are foreclosed as political. Further, Latour’s own work fundamentally depends on metaphors that *appear to disappear*.⁸² Against this tendency, I locate metaphor explicitly within a tension-ridden affective form of politics by other means.

Texts as “Contact Zones”

In order to attend to the political struggles and particularities of diverse carbon footprint metaphors in what follows, I analyse a variety of public texts, including: popular print-based texts (both periodicals and books); web sites; and government or policy-oriented documents. “Metaphors have no context-free, constant, core meaning that could then be applied differently in different contexts. Their meanings are completely context dependent and, in effect, context-created” (Franke 2000, 146). The “contexts” of carbon footprint metaphors are not limited to textual relations with other texts, but are shaped by a wider political context of “distributions of the sensible,” (Rancière 2004) which might include “past histories” (Ahmed 2004, 13) and larger-than-human impingements upon the meanings of these metaphors.

To tease out affective mediations using linguistically-rendered texts might seem a contradiction, given the ‘vitalist’ imperative to attend to affects that are pre-discursive; importantly, however, even vitalist theories of affect theorize *through language* as an inescapable conundrum. Notably, such theorists think at the limits of language and use metaphorical language that defies easy representation.⁸³ When I tease out associations among “carbon footprints” and other novel carbon compounds such as “carbon subjectivity”, “carbon citizenship” and especially, “carbon vitality,” in what follows, I am

foundationally situating these *as metaphors* that bring into visibility key struggles in the cultural politics of climate change. Like Sarah Ahmed (2004), Kathleen Woodward (2009) and others who analyze texts to elaborate a politics of affect, I do not claim that affect is *in* the texts that make up my case studies (just as affect is not resident in human subjects); rather I consider these texts to be “contact zones” (Ahmed 2004, 14) that draw together particular actors, histories, norms, disruptions and movements. As contact zones, texts reveal that affective associations are performative since these texts “involve speech acts which depend on past histories, at the same time as they generate effects” (ibid., 13). While the notion of “contact zones” may, in other places, be strongly associated through the work of Mary Louise Pratt with the postcolonial perspective on ‘contact’ as a colonial enterprise,⁸⁴ Ahmed’s perspective on contact is not tied to this pejorative version of contact as an exclusively colonizing force, but rather a more neutral version of contact as an inevitable affective coming-together of forces/ intensities through texts.⁸⁵ Ahmed suggests contact as a way of understanding how “the public and the personal, the individual and that social...take shape through each other, or even how they shape each other” (14). Textual contact zones reveal this active shaping of individual bodies and collectivities.

In my own study, the generation of bodies (human and non) with “carbon footprints” is at stake in such contact zones, as well as the effects of the actions and associations specified by these texts and associations. As Ahmed’s statement above brings to light, the texts I examine are not simply static descriptive entities, but are charged with speech acts that incite various individuals and publics to respond to climate change in diverse ways; the repertoire of actions that can be performed by participants in

these texts are in some ways prescribed by existing histories and associations such as those I describe in the previous chapter. In Rancièrian terms, these histories and associations delimit the existing “distribution of the sensible,” as a cartography of actors, roles, and relations within a political field. As Ahmed insists, figures of speech such as metaphors are crucial in the generation of effects in these contact zones because they leaves traces of “how different ‘figures’ get stuck together, and how sticking is dependent on past histories of association that often ‘work’ through concealment” (ibid.).⁸⁶ This statement is reminiscent of Rancière’s insistence that “[p]olitical statements and literary locutions produce effects in reality...[by drafting]... maps of the visible, trajectories between the visible and the sayable, relationships between modes of being, modes of saying, and modes of doing and making. They define variations of sensible intensities, perceptions and the abilities of bodies” (2004, 39). Metaphors may thus smuggle in problematic normative associations when they disappear as metaphors. Bringing into visibility the politically active *carrying over* force of metaphor is therefore crucial to critically examining its associations. In addition to attending to past histories and associations figured in speech through the carbon footprint metaphor, I also highlight the potential novelty of associations involved in contact through the emerging and shifting movement of the metaphor; although this metaphor traffics among familiar themes and associations it also, as I have begun to elaborate, generates new previously un-figured associations. So in attending to the affects circulating within and through carbon footprint metaphors, it is important to allow for an as-yet unfolding history at a time of climate change, one which is not yet over-written by an all-encompassing and definitive logic (ie. either an all-encompassing logic of global capital or its similarly all-encompassing

critiques). Based on Spinoza's refrain, "No one has yet determined what a body can do" (1959, 87), affect theories keep this notion of not-yetness of bodies and networks in play. Bodies are not ontologically sealed immutable beings; they only come to be sensed through relational encounters and processes that result in new bodies or "assemblages," themselves subject to shifting relations and processes (Deleuze and Guattari 1987). Neither is *the* carbon footprint metaphor definitively sealed as a device that tracks pre-scribed bodily imprints of pre-scribed bodies; rather, as the textual contact zones that I analyze reveal, this footprint metaphor attaches to and traces shifting bodies. I wish to explore the radical implications of: *no one has yet determined what a carbon footprint can do*. My own extended study gestures at *how* the carbon footprint metaphor might do what it does in an on-going process, and in these particular cases as contact zones, suggests effects of these particular cases, but there is no reaching a definitive answer on what the carbon footprint metaphor can do in the last instance:

It is this Spinozist imperative, ever renewed by the not yet knowing of affective doing that drives affect – as well as those theories that attempt to negotiate the formative powers of affect - forward toward the next encounter of forces, and the next and the next and the next... (Seigworth and Gregg 2010, 3)

As the carbon footprint metaphor of my final case study/textual contact zone in Chapter Five reveals, attention to the unfolding history of this metaphor might also centrally figure attunement to larger-than-human sensibilities that impinge upon past histories and conventional epistemologies and critiques. So, once again, while it is important to understand texts as affective contact zones that re-produce past histories and norms, as does Ahmed, it is also important to be attuned to larger-than-human traces that figure in texts. Although Ahmed's project remains tethered to a *human* circulation of affects, she

hints at an embodied materiality that is alive through texts: “words are not simply cut off from bodies, or other signs of life” (13). As such, *words* have a profoundly material relation to *worlds* and their ecologies (Higgs 2003, 124). Each impinges upon the other; just as words shape worlds, so do worlds (in all their lively contingency and specificity) shape words in often unanticipated ways. In these contact zones, “some forms of contact are presented and authorised ...whilst other forms of contact will be missing, will be erased, even though they may leave their trace” (Ahmed 2004, 14). Thus, tracing carbon footprint metaphors involves: critically grasping how certain presences, contacts and orientations are normatively authorized and valued in response to climate change through textual contact zones; *and* more centrally perceiving the trace-effects of other less-authorized contacts that might challenge norms.

PART TWO

A Tale of Three Footprints⁸⁷

In the following chapters, I elaborate my analysis of carbon footprint metaphors through three instances of carbon footprint metaphors found within recent texts that have popular or public currency (including books, websites, and news articles). This analysis clearly does not comprise a comprehensive corpus of these metaphors, but rather features case studies of three different forms of usage of carbon footprint metaphors that each offer key insights. There are compelling reasons for focusing on the three aspects or cases of the metaphor that I highlight in the three central chapters: In focusing on carbon subjectivity in Chapter Three, I am drawing attention to the way that this metaphor shapes individuals as the locus of climate change interventions; in focusing on carbon citizenship in Chapter Four, I am foregrounding the way the metaphor shapes wider geo-political (but still particularly human) connections as the scale of action; and, in focusing on carbon vitality in Chapter Five, I am drawing attention to the instances in which carbon footprints make clear manifold connections between humans and non-humans as key to the politics of climate change. Each of these case studies could be thought of as a different story of carbon footprints that has a kind of internal coherence of its own, and a discreet theoretical support of their elaboration. When combined in a series however, each productively troubles a singular reading of *the* carbon footprint.⁸⁸ An implicit chronology accompanies the analysis since each of the chapters describes a case or cases of carbon footprint metaphors that are roughly two years apart, beginning in 2008 and ending in 2012. These three have been chosen from an extensive collection, because each in turn, demonstrates how the metaphor shifts over time and in different contexts such that new associations and practices are potentially brought into view.

Each of these contact zones offers different theoretical registers through which to engage an analysis that attends to the promises and risks inherent to each carbon footprint metaphor. In Chapter One, “Carbon Subjectivity,” I explore the promises of the emergence of carbon subjectivity as a new apprehension of the ways in which human individuals are connected to the matter of climate change, but I also highlight the risks of the subsumption of carbon under the logic of the ‘*visible hand*’ of the market (for it certainly requires a very explicit and visible mechanism to make it so). Here the emergence of carbon subjects is commensurate with the viral spread of carbon metaphors that can be viewed as discursively supporting this marketized logic and disseminating it to the many individuals who in turn support the system. Feeling guilty and dispensing with this guilt, I argue, are intimately connected to how carbon is made visible to carbon subjects in these instances of the carbon footprint metaphor. Orienting the footprint in this way risks reifying an economic system that externalizes the vast elements of non-human ‘nature’ until this economic system belatedly recognizes their human value (as ecosystem services, as I take up in Chapter Five).

Chapter Four, “Carbon citizenship” explores instances of the carbon footprint metaphor which propose a new sense of political community. I draw into play notions of shared ecological and political space and citizenship as the metaphor fosters connections to fellow carbon footprint makers who are distant, in terms of both geographies and of relative carbon footprint ‘impacts.’ The rights and responsibilities of variably culpable and variably impacted sets of human fellows touched by these carbon flows bring into sight a different distribution of the sensible through this metaphor. This aesthetic recomposition may feature a politics of distributive justice for the people of the planet;

and yet, its association with some of the struggles inherent to “citizenship” (as a theory and a practice) risk limiting the sphere of the political to problematic nation-bound discourses and practices which end up, once again bolstering economic development.

As I elaborate in my fifth chapter, ecological metaphors offer the potential to explicitly present larger ecological issues through their larger-than-human traces. Chapter Five, “Carbon Vitality,” features an instance of the carbon footprint metaphor as it connects (farmed) shrimp of Southeast Asia (and the up-rooting of mangroves) to the dinner tables of an increasing human population with a taste for shrimp once considered a rare luxury. Here the up-ending of “blue carbon” – that which is stored in living coastal ecosystems – reveals a complex ecological relationality vis-à-vis carbon that this form of aquaculture significantly disregards. Bringing into visibility “blue carbon” as an index of the important marine life systems in the life of the planet, this carbon footprint metaphor promises to make marine life count in new ways; however, bringing such marine life into human accounts of the carbon footprint metaphor also risks domesticating them within carbon accounting schemes whose goals are encumbered by marketized capital.

Although each of these tales of three footprints begins with a particular instance of the metaphor and suggests a particular interpretation based on its context and a certain theoretical engagement that will vary in each chapter, there is necessary traffic between these contexts and interpretations (both within my dissertation and within public discourse). Carbon footprint metaphors do not exist in a vacuum; rather they are mutually imbricated intertextually such that they obtain significance from each other and also from other discourses⁸⁹ that may even have little to do with climate change and human responsibility. The chapters that follow are thus explorations of somewhat re-

contextualized or “re-mixed” carbon footprint metaphors such that some of their metaphorical struggles are staged for novel understanding of potential effects. Similarly, there is a certain amount of theoretical re-mixing across the chapters (eg, subjectivity, citizenship, affect theory) such that these notions throw into relief particular processes, actors and relations at play within carbon footprint metaphors. In one sense, the theoretical line in each chapter may appear as a continuum that begins with the carbon footprint of the individual subject in Chapter Three and attempts to push the boundaries from the individual subject to the connected citizen in Chapter Four and then finally through Chapter Five to the carbon footprints implicating larger-than-human ecologies; yet as my analysis reveals, the plot is not so linear and uncomplicated. Whereas stepping from the carbon footprint of a subject to those of connected human citizens and then further to those that explicitly connect humans and non-humans implies a promising intervention in the cultural politics of climate change, a certain risk for these emerging actors to be re-cast in a normative distribution of the sensible exists. What follows as analysis then, should be thought of as much as politico-aesthetic re-composition, rather than a singular course of interpreting the effects of instances of the carbon footprint metaphor; these interpretations figure ecological metaphors as important sites of political struggle at a time of climate change.

Chapter Three: Carbon Subjectivity

Small changes can add up to big results for the planet – and for your wallet. *How to Reduce Your Carbon Footprint* is full of easy ideas for saving energy and cutting pollution that will also benefit your health and finances. Enjoy doing your part to protect the earth!

How to Reduce Your Carbon Footprint: 365 Simple Ways to Save Energy, Resources and Money (Yarrow, 2008, back cover blurb)

In the year 2007, the carbon footprint metaphor went viral in Anglo-American contexts and was named “word of the year” by the Oxford English Dictionary (OED n.d.). This is also the time in which carbon footprint reduction lists were beginning to proliferate. The above call to carbon footprint makers from one such list, brings ‘carbon subjects’ into view by affectively hailing certain individuals to situate themselves within the crisis of climate change and to act in ways that the accompanying list promises will be easy and mutually beneficial. Carbon subjects are, in theory, individual people who are aware of climate change as a pressing matter of concern in which they themselves are implicated and feel an affective pull to respond to varying degrees. Yet the idea of carbon subjectivity is a complex one, both in theoretical and practical terms, and its unfolding associations present both promises and risks. *Carbon* subjectivity in this chapter elaborates a theoretical framework for understanding evolving mechanisms for making carbon appear and connecting these mechanisms to individuals – carbon footprint makers – who effect and are affected by climate change.

The key textual contact zone through which carbon subjectivity appears as an unfolding process is the carbon footprint reduction list, usually inciting subjects to change the light bulbs, among other actions. Evolving cultural sensibilities around carbon

may be traced to how a potent allotropic ‘carbon,’ bonds with other discursive elements to affectively connect to individuals in the politics of climate change. Instances of the carbon footprint metaphor like those above illustrate that bringing carbon into view is a complex undertaking that simultaneously involves (among other things): identifying carbon as the lynch-pin of a new political concern for these individual subjects via its scientific apprehension; problematizing the existing patterns and relationship with carbon for these subjects; and directing carbon subjects to self-manage through affective appeal to their guilt. I use subjectivity to describe this visceral package of effects because this term encompasses both mind and ‘gut,’ that is, the arousal of both consciousness about carbon, and feelings that accompany this consciousness. This chapter explores both the promises of newly bringing individual responsible carbon subjects into view, and the risks of particular associations that offer dispensation of guilt through human carbon markets. Here, the reduction of “affect” to the subject-centered or subjective emotion of guilt also emerges as a problematic re-centering of the human at a moment when there’s a chance of ecologically humbling humanity. While my *mise-en-scène* featured in the previous chapter asserts this metaphor’s affective *potential* to mediate larger-than-human relations, this case reveals a particularly human-centric social emotion of carbon guilt, an affect that moves toward a particular reification of a liberal consuming Western self and risks effacing other key human asymmetries and more-than-human relations and processes. Thus, while I acknowledge that affectively connecting climate change to individuals through the footprint metaphor may be necessary, I also highlight the limits of a normative distribution of the sensible in which certain modes of acting and doing as a

carbon footprint making subject structure “the field of possible action for individuals” (Paterson and Stripple 2010, 346).

How Do I Become a Carbon Subject? Let me count the ways...

As an important textual genre to emerge when the carbon footprint metaphor went viral, the list enumerating ways to reduce one’s carbon footprint enables a particular means by which certain individuals become connected to the planetary concern of climate change. I am identifying the list as a “genre” - a new but quickly recognizable form of address that follows the same patterns or conventions in addressing subjects. To supplement conventional associations of genre with a category of literature, music or art, I bring the insights of contemporary genre theory that “connect a recognition of regularities in discourse types with a broader social and cultural understanding of language in use” (Freedman and Medway 1994, 1).⁹⁰ In other words, I am suggesting a degree of shared form, content and importantly, *cultural practices* around these lists that pertain to the fact that individuals are historically coming to identify as having carbon footprints and considering a suite of individual-oriented responses. The following is one short example of many much longer lists, including full-length print-based book lists:

10 Everyday Cheap and Easy Ways to Reduce your Carbon Footprint:

1. **Replace 3 frequently used light bulbs with compact fluorescent bulbs.** Save 300 lbs. of carbon dioxide and \$60 per year.
2. **Keep the tires on your car adequately inflated. Check them monthly.** Save 250 lbs. of carbon dioxide and \$840 per year. If everyone in the United States did it, gasoline use nationwide would come down by 2 percent. If every household in the United States did it, we would save a trillion pounds of greenhouse gases from entering the atmosphere!
3. **Check your car’s air filter monthly.** Save 800 lbs. of carbon dioxide and \$130 per year.

4. **Run your dishwasher only with a full load.** Save 200 lbs. of carbon dioxide and \$40 per year. Use the energy-saving setting to dry dishes and don't use heat when drying.
5. **Make sure your printer paper is 100% post consumer recycled paper.** Save 5 lbs. of carbon dioxide per ream of paper. The paper industry is the third greatest contributor to global warming emissions.
6. **Move your heater thermostat down two degrees in winter and up two degrees in the summer.** Save 2000 lbs of carbon dioxide and \$98 per year.
7. **Keep your water heater thermostat no higher than 120 degrees Fahrenheit.** Save 500 lbs. of carbon dioxide and \$30 per year.
8. **Air conditioner check.** Save 175 lbs. of carbon dioxide and \$150 per year. Clean or replace dirty air conditioner filters as recommended.
9. **Take shorter showers.** Save 350 lbs. of Carbon Dioxide and \$99 per year. Showers account for 2/3 of all water heating costs! Using less water in your shower means using less energy to heat the water which means less pollution.
10. **Install a low-flow showerhead to use less hot water.** Save 300 lbs. of carbon dioxide and \$150.⁹¹

The brief description that follows each item on the preceding list (a characteristic of this genre) features cost-reduction since it appears on a blog whose goal is promoting frugality. Notably, however, this list is actually excerpted from a longer list on a more general web site (stopglobalwarming.org) in which these cost-saving hints also appear, suggesting that these lists help to reinforce and shape a certain liberal consuming subject as a carbon footprint maker at the centre of climate change. I will pick up on these risks of carbon subjectivity in a later section, but first, I will explore the promises offered through bringing certain responsible individuals into accounts of climate change through this list genre.

This genre varies slightly across on-line environments versus conventional print texts, and according to the agenda of the creators of each list, but a sufficient number of common elements suggest it as a fairly cohesive genre that builds on a pervasive societal "list mania" enumerating (and often ranking) all aspects of life.⁹² Importantly, the print-

based books, which I excerpt in my analysis go into more detail and offer a more nuanced account of the possible range of practices than those in the list above. These books include: *How to Reduce Your Carbon Footprint: 365 Simple Ways to Save Energy, Resources and Money* (Yarrow 2008); *The Environmental Equation: 100 Factors that Can Add to or Subtract From Your Total Carbon Footprint* (Shimo-Barry 2008); *101 Ways to Reduce Your Carbon Footprint* (Bomholdt 2010); *Pocket Idiot's Guide to Your Carbon Footprint* (Grant 2008); *You Can Save the Planet: A Day in the Life of Your Carbon Footprint* (The Guardian 2007). I will particularly attend in my analysis to the important introductory statements in these book lists as they map out an unfolding landscape of carbon subjects vis-à-vis climate change by connecting the bodies of these individuals to the problem and orienting the kinds of solutions subjects may undertake. Recalling Rancière's notion of the distribution of the sensible, these introductory statements present "facts" that "simultaneously disclose the existence of something in common," in this case, climate change as a matter of planetary concern, "and the delimitations that define the respective parts and positions within it," in this case, carbon subjects and the roles and positions they may occupy (Rancière 2004, 12). The bulk of the lists appeared in 2007 – 2009, the early days of the viral existence of carbon footprint metaphors. While the publication of these prescriptive lists has slowed somewhat, their historical importance remains in the launching of carbon subjectivity. Recalling that metaphors emerge in semantic gaps, this carbon footprint list genre is particularly important because it responds to the urgent question, *what is to be done about climate change?*, by giving individuals a sense of meaning and control through a set of micro-practices that will presumably add up to mitigation results.

Keeping in mind the precept from discourse studies that contexts of discourses matter, I do not claim that this list genre produces monolithic effects, but rather that when these discreet lists are taken together and multiplied in various public contexts, they foster a certain generalized orienting response to climate change; this response is individualized and privatized, often calling on the actions of homeowners as they go about their everyday activities. Such lists prescribe actions like: changing the lightbulbs, adjusting the thermostat and planting a tree, among a suite of options.⁹³ Many of the lists from 2007-2008 also suggest offsets⁹⁴ (a point that will be addressed later). Taking these texts as contact zones that authorize particular orientations and foreclose upon others, I analyze the specific political practices that these lists enable. First, I briefly draw attention to an unfolding theoretical understanding of carbon subjectivity, and then elaborate on its promises and risks that I wish to highlight as central to the effects of the carbon footprint reduction lists.

The emergence of carbon subjectivity heralded through carbon footprint metaphors describes an ambivalent affair in both practical and theoretical terms. Among a long tradition of political theories of subjectivity (Hegel; Althusser; Lacan; etc.) that describe a process of individuation through social or political forces, I am building on Foucauldian notions that insist there is no pre-existing category of “the subject” as a thinking, knowing, transcendental or psychologized individual that enters into a political arena in a generalizable way, but that specific “positions of subjectivity” arise as effects of discourses and practices in a political and historical arena (Foucault 1969/1989, 60-61):⁹⁵

In the proposed analysis, instead of referring back to the synthesis or the unifying function of a subject, the various enunciative modalities manifest his [SIC]

dispersion. To the various statuses, the various sites, the various positions that he can occupy or be given when making a discourse. To the discontinuity of the planes from which he speaks. And if these planes are linked by a system of relations, this system is not established by the synthetic activity of a consciousness identical with itself, dumb and anterior to all speech, but by the specificity of discursive practice. I shall abandon any attempt, therefore, to see discourse as a phenomenon of expression – the verbal translation of a previously established synthesis; instead, I shall look for a field of regularity for various positions of subjectivity.
(1969/1989, 61)

“Carbon subjectivity”, I propose,⁹⁶ emerges at the turn of the millennium as a novel and ambivalent “position of subjectivity” brought about through discursive practice in the politics of climate change. Foucault’s analytic attention is occupied with how individuals with certain political positions discursively emerge on a political “plane.” Against conceiving of a fixed structure or naturalized system connecting these planes and the subjects within them, Foucault insists that such systems are constructed through discursive practice. This aspect of Foucault’s thought resonates with Rancière’s notion of distribution of the sensible which draws attention to how “political statements and literary locutions” draw a cartography of a visible system and the constructed occupations of those with positions in this system (2004, 39); however certain differences also exist between the two.

Unlike Foucault, Rancière asserts an aesthetics at work within the distribution of the sensible and thus his thought fosters attention to the composing work of *metaphors* and how they affectively pull bodies together as I have described in the previous chapter. Another key difference is Rancière’s naming of “subjectivity” as the active force of newcomers appearing to disrupt a normative distribution of the sensible. Rancière suggests that:

...the political process of subjectivation... continually creates ‘newcomers’, new subjects that enact the equal power of anyone and everyone and construct new words about community in the given common world...Subjects... are ‘newcomers’, who allow new objects to appear as common concerns, and new voices to appear and be heard. (2010, 59-60)

Rancière describes subjectivation as a process whereby agents come to have a say in politics, to potentially interrupt an existing construction of the world. Foucault does not accord subjectivity such a role, but rather sees it as an effect; thus Foucault, by contrast with Rancière, is occupied with historical specificities, the everyday micropolitics of how various subjects come to be through discourse. For Foucault, understanding how ‘subjects’ like medicalized bodies or sexualized bodies come to occupy these subject positions in a particular time and place entails tracing the specific discursive practices of and historical struggles of these times and places (1978/1990; 1969/1989).

Drawing attention to a generative metaphorical struggle over subjectivity itself in these theorizations on the theme by Rancière and Foucault (as well as those who take up Foucault’s notion of governmentality and Judith Butler who takes up subjectivity more broadly⁹⁷), I am interested in exploring the sympathies and tensions between understanding carbon subjects as “newcomers” and understanding carbon subjects as “discursive effects;” the promises and risks of the affective pull of carbon footprint metaphors emerge in this interplay that I will tease out below. I propose with Rancière, that “the opening of an interval for political subjectivation” (2010, 69) enacted through calling on individuals with carbon footprints offers the potential to make visible previously obscured actors or “newcomers” that have had no explicit part within the given distribution of the sensible of climate change; with Foucault, however, I also attend to the discursive practices that define the roles and fill in the content of what these

“newcomers” can do. In what follows, I bring the notion of carbon subjectivity as a Rancièrian opening into conversation with Foucauldian notions of “governmentality” which describes an ambivalent process of how these subjects come into political play to manage their own carbon, “directing their conduct, constraining their actions and reactions...”(Foucault 2008/2004, 2).

The Promise of Reconfiguring the Power and Responsibility of Individuals

The promise of carbon subjectivity affectively launched through an appeal to reduce one’s carbon footprint hinges on its ability to bring certain responsible individuals centrally into the politics of climate change⁹⁸. As described in Chapter One, during the decade of 1990-2000 when climate change visibly emerged as a planetary public concern, a certain regime of climate change politics began to take hold. While the previous planetary abstraction of climate change (and carbon) had been brought ‘down to Earth’ in certain ways, climate change remained largely abstract for individuals in their daily lives. The political bodies of the IPCC and Kyoto Protocol-enabled carbon markets inscribe roles for scientists, architects of global governance and policy, national governments, environmental economists, global corporations, and some local organizations but they left individual people out of political accounts. In the forward to the book, *101 Ways to Reduce Your Carbon Footprint* (Bomholdt 2010), Bill Burtis, Manager of Communications for the non-profit Clean Air-Cool Planet, suggests: “People aren’t taking action to do something about global warming because they feel powerless”(10). Citing a general trend of climate change communications and (in)action following an IPCC report that sets up the solution through a proposed new bill (in an American context), Burtis states:

But bills and wonderful ideas like deserts full of solar cells and algae, while they make great goals and terrific targets, lack a crucial ingredient: We can't do them. We – the people who have to keep our heads out of the sand; who have to listen to the tales of feedback loops, floods, droughts, starvation, and war; who have to stay in this in order to get Congressional delegations to pass a climate bill and governors to allow off-shore wind and state legislature to pass renewable energy incentives – we need things we can do. They need to be simple, easy, inexpensive, normal, unweird things. (ibid., 11)

Burtis expresses a common feeling of debilitation and dis-connectedness from the massive planetary problem of climate change and its proliferating and cascading effects. This, in Burtis' testimony, is the genius of the book, *101 Ways to Reduce your Carbon Footprint*; the list empowers certain individuals who want to do something about climate change by allowing them to appear in these politics. While Burtis' phrase "we – the people" in the above quotation deserves critical attention, I will suspend this judgment of the liberal environmental subject momentarily in order to attend to a necessary shift that occurs. This shift generates "another distribution of the sensible, another setting of the stage, in producing different relations between words, the kinds of thing that they designate and the kinds of practices they empower" (Ranci re 2010, 54). Rather than reinscribing the normative sense of climate change in which, as Burtis suggests, disaster narratives predominate and certain experts occupy the positions of authority to speak about and act upon climate change in a global order, this new affective connection of a carbon footprint to individual people marks an *opening for political subjectivation* of these individuals. Such individuals must be affectively connected to climate change politics to register, to have a say and to act in these politics. Crucially, the carbon footprint metaphor in these lists enables certain subjects to see their own 'footprints' attached to the issue of climate change and to do something about these impacts. In a world partly constructed on a discursive and political exclusion of the relationships

between carbon, various publics and their constituent individual actors, conventional terms of political subjectivity and the norms of daily individual life are tested with the advent of anthropogenic climate change. The metaphor of the carbon footprint promises to address this semantic and political gap by registering the mark of an individual carbon-emitting human at the centre of climate change. The emergence of carbon footprint metaphors thus initiates, in language, this new form of subjectivity to challenge the given terms of politics. The kind of newcomer that emerges in this discourse is an emitting individual who is susceptible to examining his or her daily practices vis-à-vis climate change and *potentially* shaping these practices differently. I am not suggesting that these largely privileged Western individual subjects do not already appear in politics writ large, but rather that they are being invited to appear differently in climate change politics by thinking of themselves as carbon producers who have a responsibility to reduce their carbon production. The emergence of a carbon subject thus entails connecting the politics of climate change to an individual who shares in the distribution of how carbon is accounted for (and managed) with the discursive practices of carbon footprint reduction lists further bolstering the terms of carbon subjectivity.

Even those who take up a Foucauldian frame of governmentality in order to critically examine the managerial practices discursively constructed in climate change politics begin by acknowledging the promise of bringing individuals into these politics (Paterson & Stripple 2010). As I describe below, there exists a certain sympathy between the initial discursive hailing of a carbon (governmentalized) subject and what Rancière calls the “opening for a space of political subjectivation” for these individuals in the cultural politics of climate change. Before I describe these sympathies, I will first draw

attention to how these carbon footprint reduction lists might lend themselves to a Foucauldian analysis of ‘governmentality’ through which carbon subjects come to self-govern.

The textual contact zones of these carbon footprint reduction lists do not issue from a central authority that forcefully charges and threatens individual subjects to self-manage; rather, they emerge from various public fora and institutions such that individuals willingly participate in the call to become subjects; the many extended book lists, for example – *How to Reduce Your Carbon Footprint: 365 Simple Ways to Save Energy, Resources and Money*; *The Pocket Idiot’s Guide to Your Carbon Footprint*; *The Environmental Equation: 100 Factors that Can Add to or Subtract from your Total Carbon Footprint* and others – are popular books that must be purchased or borrowed from libraries voluntarily by emerging carbon subjects who are conscious of climate change as a problem and upon whom an affective appeal to connect to mitigation efforts works. Similarly, the on-line lists are generally accessed through an intentional act on the part of individuals. Carbon subjects, then, are part of a complex circuit of power. As Foucault’s historical analysis demonstrates, in contemporary times, power does not singularly issue from a centralizing authority or (sovereign) power of state government over the subjects it rules; rather power operates in a diffuse network, flowing through various non-state and state institutions, as well as *through the bodies of individual subjects themselves*. Thus, rather than top-down governmental forms of authority that make or discipline political subjects through force (or penalty of death in previous historical times), Foucault conceives of a dispersed “governmentality,” a new kind of

rationality that enjoins individuals themselves to freely submit to forms of self-discipline according to the specific rationalities at work (2004/2008).

Matthew Paterson and Johannes Stripple have taken Foucault's well-known governmental formulation of the *conduct of conduct* into the realm of climate change politics by suggesting that we may now talk about the "conduct of carbon conduct:"

...a government of people's carbon dioxide emission that does not work through the authority of the state or the state system, but through people's governing of their own emissions. Different regimes of 'carbon calculation' operate so that individuals either work on their emission-producing activities or to 'offset' their emissions elsewhere. The conduct of carbon conduct is therefore a government enabled through certain forms of knowledge (measurements and calculations of one's own carbon footprint), certain technologies (the turning of carbon emissions into tradable commodities), and a certain ethic (low-carbon lifestyle as desirable). (2010, 347)

In their ambivalent analysis of this evolving governmentality, Paterson and Stripple caution against reproducing a simple critique of a 'misplaced' individualism written into the governmental forms of conduct of carbon conduct and instead suggest a more nuanced account of how "knowledge," "technologies" and a "certain ethic" work together to shape this conduct as part of a larger dynamic of climate change politics. This nuanced perspective suggests that while there is reason to critique a singular focus on individualism in these politics, some focus on individual loci of control and the market is, in fact necessary. "Sure the creation of markets does so in a way that pursues commodification, but such commodification cannot logically exist without individuals. Power operates through individual practice, not over and against it. At the same time, such remaking of individual practice involves reconstructing collectives themselves" (Paterson and Stripple 2010, 344). Understanding the affective mediations of carbon

footprint metaphors entails understanding how individuals are being drawn together to produce collective responses with a variety of ambivalent effects.

In the above quotation, Paterson and Stripple suggest the carbon footprint as a measure located within the realm of “knowledge” in this locus of governmentality. This characterization is partly accurate since subjects do use the metrics of carbon footprint calculators to inform their knowledge, as I describe further below; however, the normative reification of the carbon footprint as a quantitative metric also bears scrutiny. My analysis of the carbon footprint *metaphor* (not only calculus) suggests that through these lists, this metaphor affectively mediates relations between all three of these sites, bringing knowledge to subjects about the problem of climate and measuring their impacts, providing “certain technologies” of tradable carbon commodities as mechanisms to lower *your carbon footprint*, and featuring a “certain ethic”/ morally-coded affect of lowering one’s carbon impacts (though this ethic is ambivalently connected to the affect of carbon guilt as I describe below). I will draw these out with specific examples from the lists below, but first I will remain for a moment on the promise involved in this form of governmentality.

Problematizing Carbon Conduct

As Paterson and Stripple insist “government is a problematizing activity. Issues and concerns have to be made to appear problematic” (2010, 345). The knowledge that launches this form of governmentality for carbon subjects, affectively mediated through carbon footprint lists, begins with self-reflection about one’s conduct in relation to an identified problem, in this case, climate change. While there is reason to examine certain liberal environmental practices that “structure the field of possible action for individuals”

(ibid., 346), the fact that liberal subjects are coming to question their conduct at all with the advent of climate change, offers a generative opening. Such a problematization of one's own conduct, especially with regard to the practices of carbon subjects vis-à-vis climate change creates what Paterson and Stripple call a “dynamic of awareness raising which gives resources to individuals to change practices” (345). The promise for Paterson and Stripple in this account is the very act of connecting individuals to a problem in which they are implicated. “Problems are not pre-given, but have to be constructed and made visible. This process can occur in different ways in different sites and by different agents” (346). In this case, metaphor itself is a site through which problems are constructed and made visible through worldly acts of yoking. The mediations of carbon footprint metaphors, especially these carbon footprint reduction lists help to make the problem of climate change newly visible within the daily lives of individual carbon subjects.

Many of these carbon footprint reductions lists lead with a problem statement about anthropogenic climate change before connecting the problem to the bodies of individuals with footprints. After briefly defining a carbon footprint as “the amount of carbon dioxide (CO₂) emitted as a direct or indirect result of an activity,” Joanna Yarrow's book-length list follows with the heading, “What's the Problem?” (2008, 6). This section defines greenhouse gases, their beneficial historical impact upon planetary living conditions and the unprecedented historical scale of contemporary human impacts:

Since the Industrial Revolution, human activity – primarily through the burning of fossil fuels... – has been releasing CO₂ that was absorbed over millions of years at a rate far faster than it can be reabsorbed, and it's building up in the atmosphere.

At the moment, CO₂ is being released about three times faster than it can be reabsorbed. Every second, human activity emits another 770 tons – enough to

fill 140 Olympic-size swimming pools (2008, 6).

After making climate change visible as an unprecedented historical problem in pace and scale, in a following section, “What can we do about it,” Yarrow connects to the individual scale of the footprint:

The fact that almost every area of human activity contributes to our carbon footprint might sound like an overwhelming problem. But the good news is that this gives us scope to reduce our footprint in almost every aspect of our lives...Governments worldwide are debating how best to regulate emissions, and businesses are beginning to take responsibility. But the issues are so enormous... that change at every level is crucial.

As individuals, there are numerous things we can each do to reduce our carbon footprints – in our everyday actions and in our wider sphere of influence as consumers, voters, and global citizens. We all have the power to significantly reduce our footprint by making low-carbon choices. (2008, 8-9)

Yarrow makes reference to the global scales at which action has been directed thus far, but notes that an individual scale must also be addressed. Resonating with Yarrow’s words and the comments of Burtis above in Bohmholdt’s book list, Paterson and Stripple suggest that a shift to individuals marks a necessary re-distribution in climate change politics. During early efforts to address climate change, “the focus of action had been on states and firms but in the early 2000s this started to be complemented by a focus on individual practice” (2010, 341). Newly recognizing that political subjects have carbon impacts or “footprints,” means acknowledging a prior exclusion in the conventional terms of political subjectivity; thus, the emergence of carbon footprints constitutes the carbon subject, not a real individual or set of individuals, but a category or un-acknowledged relationship between individual subjects and carbon. Making these associations clear – how individuals are connected of the issue of climate change – is part of the promising

work of the texts that enable carbon subjectivity to take hold through appeals to carbon footprint makers.

A characteristic of carbon subjectivity expressed through carbon footprint metaphors in the list-genre is a certain quasi-scientific engagement with “carbon selves” that has developed as a result of the ways in which carbon has become visible for a wider public at a time of climate change. This is part of the “governmental” knowledge generation that allows for the conduct of carbon conduct for subjects. Among the first published books in 2007-2009 for lay-publics (following the on-line versions) that brought carbon subjects into existence through the carbon footprint metaphor, a certain opening statement in these book lists features a scientific engagement with the element of carbon as it relates to climate change, industrialization as the combustion of carbon, and to the footprint of each individual on the planet. *The Pocket Idiot’s Guide to Your Carbon Footprint* (2008), for example, briefly defines carbon footprint and then situates it within a discussion of the element of carbon and the carbon cycle of the planet.

Let’s get started with a look at the *carbon cycle*. Carbon appears in many forms throughout the planet. Carbon is a part of every living thing, even dead things that are decomposing. Carbon is an *element*. Carbon molecules can be alone, or they can move around to combine with other elements. In one form or another, carbon is under our feet in the soil and rocks, around us in the plants and animals and people we live among, in the foods we eat, and in the air we breathe. Carbon is one of the building blocks of life... Carbon is the sixth most abundant element in the universe. (4-5)

Reading like a somewhat reduced science lesson on carbon, reminiscent of an introductory unit on chemistry/Earth sciences, this section situates carbon as a foundational planetary element to which a planetary “we” are already *subject* as we enter the planetary scene as a species. Similarly, *How to Reduce Your Carbon Footprint: 365*

Simple Ways to Save Energy, Resources and Money (2008) names a carbon footprint “as the amount of carbon dioxide emitted as a direct or indirect result of an activity” and then contextualizes this new definition within a planetary carbon cycle that precedes humans but foundationally facilitates their entrance onto the planetary stage. The book-length lists often feature some description of “the good greenhouse,” the non-anthropogenic heat-trapping gases which, along with foundational element of carbon, “makes life on our planet possible” (Grant 2008, 9).

The next problematizing move implicates human activity since the Industrial Revolution. These carbon footprint lists thus reinforce the idea that the planetary scale of recent climate change, attributed to contemporary human civilization itself, suggests nothing less than the need for a massive intervention in what have come to be normal patterns of human life for a dominant many at the turn of the millennium. Our relationship to carbon has been largely identified as the one that is off kilter; the landmark study of Revelle and Suess (1957) mentioned in Chapter One is exemplary of this identification:

Human beings are now carrying out a large-scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future...we are returning to the atmosphere and oceans the concentrated organic *carbon* stored in the sedimentary rocks over hundreds of millions of years (19). (emphasis added)

As Spencer Weart (2011) insists, the above excerpt has gained recent currency in a wide variety of texts; such statements have helped shape a cultural imaginary around climate change, relationality and processes vis-à-vis carbon. Thus, it is at the ‘carbon-level’ that intervention has been proposed. Intervening, however, may be difficult for those for whom carbon dioxide and other greenhouse gases still remain largely abstract. For many

lay-people, until the emergence of climate change consciousness, “carbon” as a named element was not as explicitly relevant to daily life. Linking this allotropic element to the metaphor of the footprint as a symbol of imprints/ impacts affectively connects this scientific abstraction to the day-to-day experiences of subjects. As mentioned in Chapter One, this form of scientific apprehension of carbon as it relates to climate change is reduced in complexity for a lay-audience, so paradoxically, carbon gets both discursively reduced *and* generalized, which allows it to function for a variety of agendas. The scientific ‘facticity’ involved in representing the problem initiates a sense of authority that is carried over in the subsequent “mobilizing of individual subjectivity and individuals’ capacity to govern themselves” (Paterson and Stripple 2010, 346).

Crucially, however, the specific metaphoric capacity of the “footprint” also helps to mediate the visible and invisible relations in these politics such that certain actors and relations appear (and others do not); thus, while the carbon footprint comes to be normatively understood as a metric, its powerful metaphoricity is also affectively at play in drawing out what/who comes into visibility and what is problematized. In the introductory pages of the *Pocket Idiot’s Guide to Your Carbon Footprint*, for example, Nancy Grant explains, “[y]our carbon footprint is invisible – you can’t look down at the kitchen floor and see it the way you might notice snow⁹⁹ from your boots...but this imaginary symbol represents the focus of intense interest today” (Grant 2008, 3). By carrying over these associations of footprints as messy imprints and encouraging subjects to use their imaginations, these carbon footprint reduction lists present an opening for yoking together the unlikely entities of carbon and footprints; attaching these carbon footprints to the bodies of carbon subjects brings these messy imprints of individuals into

view. “Unfortunately, no one has yet invented a cheap, reliable, easy-to-read, all-purpose environmental impact gauge. But you can use your imagination to visualize how your actions affect the natural world” (ibid.). The carbon footprint provides the “imaginary symbol” for visualizing impacts in the absence of such an “all-purpose environmental impact gauge.” Such statements reveal a pivotal point about carbon footprint metaphors as entities that reveal an aspiration beyond what is apprehensible. This aspiration again recalls Marshall McLuhan’s evocative pun, as mentioned in the Introduction: “a man’s [SIC] reach must exceed his grasp or what’s a metaphor?” (1964, 7). The carbon footprint in this instance expresses a reach exceeding a grasp, where the grasp would be a metric or gauge that is not yet available (nor ever will be, as I insist). The grasp is towards a scientific, quantitative, all-in definitive calculation in this instance, but the reach is an always-partial account that requires the imagination to fill in. The risks of the political “filling in” of the content of this metaphor for carbon subjects also require critical attention, as I elaborate below, but I would like to linger on one further promise enabled through the metaphor’s affective drawing together of bodies.

The political promise of carbon subjectivity enabled through carbon footprint metaphors consists in its potential not only to connect carbon to responsible individuals, but also to connect these individuals to a comparative planetary calculus of footprints. While it is important to note that the appeal in this new form of subjectivity is generally made to a western consuming liberal subject, arguably *these are the very subjects that most need to appear in a governmental frame of problematizing their carbon conduct*. Such a calculus, opened through the metaphor in the first instance, reveals a profound disparity in existing freedoms to emit among carbon footprint makers; identifying carbon

subjects with carbon footprints potentially brings to light such disputes over freedom to emit greenhouse gases associated with certain lifestyles and the relative (in)equality in the distribution of these freedoms. The genre of lists that establishes carbon subjectivity through carbon footprint metaphors may function to bring these inequalities to light, revealing that some are more subject to the appeal to carbon subjectivity than others. In the introductory section of her book, *How to Reduce Your Carbon Footprint*, Joanna Yarrow states:

People all over the world are emitting CO₂ at unsustainable rates. But some of us are worse than others. The average European emits around 11 tons per year, while the average American emits over 22 tons – more than 5 times the world average (4 tons). In contrast, in sub-Saharan Africa the average footprint is less than 0.8 tons per person. (2008, 8)

Similarly, in her introduction to *101 Ways to Reduce Your Carbon Footprint*, Andrea Bohmholdt suggests, "...as a nation, Americans tend to consume more energy per person than do residents of any other country" (2010,15). Attention to pre-existing, but somewhat more urgently pressing global inequalities is enabled by the calling to account of carbon subjects through carbon footprint metaphors.

Crucially as these lists reveal, not everyone appears 'equally' as a carbon subject; the appeal to carbon subjects to reduce their carbon footprints is not an appeal to a carbon subject in sub-Saharan Africa where "the average footprint is less than 0.8 tons per person" (Yarrow 2008, 8). In terms of a Rancièrian opening for subjectivation, these subjects with already low carbon footprints do not really appear to have a 'say' in the micropolitics of a daily carbon footprint inventory (changing lightbulbs, lowering thermostats, etc). And yet paradoxically, they do appear to trouble or question the gargantuan footprints of those in the global north. When a comparative calculus is

featured, this knowledge of widely divergent carbon footprints potentially plays a part in the governmental problematization of carbon conduct (I will develop how the carbon footprint metaphor brings these inequalities into view through the frame of “carbon citizenship” in Chapter Four). A prolonged attention to disparities, however, remains an unfulfilled potential within the carbon subjectivity initiated through carbon footprint reduction lists. Most other publicly-directed carbon footprint books or lists of the same era do not contain explicit statement of inequities of a systemic kind (be they oriented at nations, or sectors, or lifestyles, etc) and even the two mentioned above do not develop this notion of inequity beyond an initial cursory statement. Some texts, in fact, feature the uniqueness of *your* carbon footprint; the *Pocket Idiot’s Guide to Your Carbon Footprint* insists that, “your situation is unique – and that’s where this book can help you. Instead of trying to come up with nationwide averages...we look at numbers that will have value in your particular case. A carbon footprint is definitely not one-size fits all” (Grant 2008, 21). This kind of statement metaphorically connecting a carbon footprint to a kind of shoe-shopping enterprise that is highly individualized, reveals a normative distribution of the sensible in which carbon subjects appear as domesticated consumers within a liberal environmental order.

Attention to such discourses compels understanding the ambivalent tropic shifts of the metaphor even within this textual contact zone of the list genre. The carbon footprint is generally elaborated in the lists in both qualitative and quantitative terms in its appeal to carbon subjects. Words like “impact” in many definitions partially suggest a qualitative mode of engagement where carbon subjects theoretically embrace a will to reduce emissions and make gestures to improve their legacy, while words like “amount”

or measure speak to a quantitative mode. Crucially however, even when these lists propose a quantitative definition or metrics, the metrics are notoriously variable. In *The Pocket Idiot's Guide to Your Carbon Footprint* Nancy Grant suggests “the size of your carbon footprint may become one of the most important *numbers* [emphasis added] in your life in the twenty-first century,” but then goes on to suggest a few pages later that the number and complexity of the calculations would take a long time to compute...Something else makes calculating your carbon footprint even trickier. It has two parts!” (2008,8;18). Grant then proceeds to explain the “primary” and “secondary” carbon footprint of an activity, whereby the primary carbon footprint consists of the direct impacts of an activity and the “secondary carbon footprint consists of the greenhouse gas impact of the things that are an indirect part of this activity [or product]” (ibid., 19). The secondary footprint is notoriously tricky to calculate definitively, especially with the partial “situated knowledges” (Haraway 1998) coming from ‘humans’ and their instruments that represent only a partial picture of the actors, relations and processes involving carbon. These relations and processes cannot be easily isolated and understood in a finally transcendent “objective” way¹⁰⁰. In short, the infinite number of possible calculations exposes the carbon footprint as (among other things) an aspirational quantifier that will never reach a definitive mark, but rather, offer trace effects.

Some call to quantify carbon footprint analysis more rigorously (Berners-Lee 2011), yet the metaphor is evasive and owes allegiance to no singular metric or interpretation. Carbon footprint metaphors operate in these qualitative and quantitative tensions. The book *How Bad Are Bananas: The Carbon Footprint of Everything* (Berners-Lee 2011) is a more recent manuscript in the list genre that, in some places,

encapsulates these kinds of tensions; significantly, it is the only one among the lists that explicitly uses the term “metaphor:”

I’m using the word *footprint* as a metaphor for the total impact that something has. And I’m using the word *carbon* as shorthand for all the different global warming greenhouse gases. So I’m using the term *carbon footprint* as shorthand to mean the best estimate that we can get of the full climate change impact of something. (Berners-Lee 2011, 5)

Berners-Lee’s definition implicitly acknowledges some key elements. First, he affirms that the (carbon) footprint is a metaphor, which suggests a certain critical semantic gap between the assumed direct representational equivalence of language and what it nominates. While he does not explicitly name the element of carbon as a metaphor, he implies that it works metaphorically (or ‘metonymically’ as a part used to express an associated whole) by suggesting it as “shorthand” for all the various greenhouse gases. Acknowledging the carbon footprint’s metaphoricity therefore hints at a certain non-representability that will defy even his own efforts to pin it down definitively. Further, he states “I’m using the word” each time he defines a term, thus acknowledging the wide range of practices that surround carbon footprint metaphors. Using the personal pronoun “I” positions Berners-Lee as one of many who use the carbon footprint metaphor for a variety of purposes.

Another element of the definition, the term “shorthand”, underscores the elliptical and metaphorical nature of “carbon” in the footprint metaphor. As a stand-in for a host of greenhouse gases, carbon here discursively reduces not only these other greenhouse gases, but also a range of other ecological actors that will not be counted, except if they weigh in on a carbon scale. “Best estimate” in the above definition further highlights the imprecision that both plagues this metaphor as a metric and allows it to powerfully

proliferate for a number of competing agendas. A best estimate may be a grasp for a number, but one that by definition remains highly contingent and only suggestive of a certain variable range that is subject to change. In short, Berners-Lee's definition returns the metaphoricity to the carbon footprint, points to its qualitative and quantitative mixture, and suggests that it can never be an accurate measure. What is slightly ironic, however in what follows in the text, is that Berners-Lee demands more rigour in its quantitative use. He suggests that the "phrase carbon footprint" (now no longer cited as a metaphor) encounters abuse by missing out on "some or even most of the emissions caused" (6). He even goes so far as to suggest another metaphor, "carbon toeprint," for this kind of "abusive" analysis of partial emissions (ibid.). Never quite permitted to be completely qualitative (how can carbon really be a quality?), but failing all the while to be quantitatively rigorous in the ways demanded of it, the carbon footprint metaphor when explicitly analysed, performs a kind of splice that troubles treating climate change from either an exclusively qualitative or exclusively quantitative point of view. A key aspect of carbon subjectivity suggested by these lists is that the qualitative and the quantitative can be mobilized in the cultural politics of climate change to create effects and affects for different agendas.

Carbon footprint metaphors trace these tensions between aspirations of quantitative metrics and the "filling in" of imaginaries for carbon subjects. Crucially, however, an explicit engagement with the imaginary is often what is left behind in accounts of carbon footprints, so the imaginary and political "filling in" of content is both initially needed, and then cast off in these lists as they then derive a certain authority from what seems scientific, objective and beyond examination. Thus, while the conduct

of carbon conduct mediated through these lists relies on what appear to be knowledge and facts about climate change and its connection to individuals, this conduct is, from the outset mediated by what Bruno Latour would call an “imbroglio” of facts and values (2004).

Thus, ambivalently, the emergence of carbon footprint metaphors in these lists enables carbon subjects *to appear* to draw attention to carbon relations, processes and inequities and to distribute responsibility, but then risks foreclosing upon these very politics. What remains, as I describe in what follows, is a feeling of guilt on the part of certain individuals along with a range of possible practices for dispensing with that guilt. My purpose for naming a carbon subject here is to accentuate this theoretical frame that keeps open the question or “dissensus” (Rancière 2010) that founds the naming or appeal to individuals through carbon footprint metaphors, as a mechanism for individuals to appear as producers of carbon impacts individual lay-people had not yet been accorded a central role in these politics¹⁰¹. Yet as these individual carbon subjects appear and become associated through carbon footprint metaphors with specific practices generated through the list, this theoretical frame of carbon subjectivity also prompts a critique of the risks of who appears and how they appear to conduct their carbon conduct. Many of these practices function to bolster the perpetuation of a carbon subject who is constituted upon these very unequal relations with global others. While there is every reason to recognize carbon as a constitutive element of life and to problematize the practices of individual culpable carbon emitting subjects, there is also reason to examine how the emergence of a guilty carbon subject involves naming and *taming* such that footprints can be domesticated and managed in specific ways that reify existing inequities and systems of

ecological degradation. Although Paterson and Stripple draw attention to the making of governmental subjects as enabled partly through “a certain ethic (low-carbon lifestyles as desirable)” (2010, 347), the tensions involved in the mechanisms for reducing one’s carbon footprint reveal a wide range of interpretations of how to achieve “low-carbon” lifestyles. These diverse interpretations are enabled by the ways in which carbon footprint reduction lists affectively generate “carbon guilt” and its dispensation.

The Risky Practices of Guilty Subjects

While the association between carbon and guilt has gained popular currency in the past few years (Gans 2012; McFeatters, 2007; Millward 2007), little attempt has been made to understand how the carbon footprint metaphor affectively initiates and mediates this feeling. Carbon guilt suggests what Kathleen Woodward might call a “psychological” feeling that is captured in language “with the narrative of our experience a crucial capacity” (Woodward 2009, 25). Naming this novel affect, or psychological feeling of carbon guilt allows a narrative elaboration of a contemporary experience that connects the bodies of liberal governmental carbon subjects through certain practices. Like Woodward, I attend here to “feelings as sensitive and telling sensors that register emerging shifts in social and cultural formations” (ibid., 7). As carbon has become visible through its scientific apprehension and then distributed to individuals through a variety of mechanisms, including the prominent carbon footprint reduction lists, becoming subject to carbon has entailed a novel sense of guilt on the part of certain privileged individuals. Such individuals, if over a certain age, might recall a time when one might have for example, gone for a destination-less “joy-ride” in a car without feeling guilty about carbon emissions.¹⁰² The freedom to emit greenhouse gases with impunity even extended

to air travel, what is now known to be a particularly potent climate-changing site of emissions. With the novelty of public knowledge of the carbon impacts of such fossil-fuel intensive lifestyles, largely normalized in the global north, has come carbon guilt, a feeling intimately linked to a dominant form of carbon subjectivity in which certain subjects are connected in an enigmatic multi-scale globalized and yet domesticated and privatized calculus of carbon. The subjects susceptible to carbon guilt are generally home-owners in the global North with fossil fuel-dependent vehicles and lifestyles, that is, subjects whose practices of consumption are centrally implicated in the crisis of climate change. These are the people who are hailed within many lists which invite “you” to change the light bulbs, install energy-efficient windows, or buy a hybrid or electric car.

Instrumental in these lists is the appeal to “you”, which inaugurates the guilty carbon subject, an individual who is newly recognized as part of the problem (and thus, solutions) in the cultural politics of climate change. “You” are invited and told how to reduce “your” carbon footprint. Popular book titles such as *How to Reduce your Carbon Footprint*, *101 ways to Reduce Your Carbon Footprint*, and *The Pocket Idiot’s Guide to Your Carbon Footprint* exemplify the kinds of lists that proliferate in conventional and on-line media in this genre. This call to “you” and the response – to buy the book list/ follow the on-line list and act in a variety of ways to reduce your carbon footprint – entails what Judith Butler might describe as a psycho-social circuit of power that produces (guilty) subjects (1997).

In *The Psychic Life of Power*, Butler’s chapter entitled “Conscience Doth Make Subjects of Us All,” works within and against Louis Althusser’s formulations on the interpellation of individual subjects into a symbolic order by an authority. (Butler 1997,

106-131; Althusser, 1971). In Althusser's well-rehearsed formulation, the police on the street calls "Hey you there!" and an individual pedestrian, in turning to respond to this power of authority/law becomes subject to it, through interpellation (ibid.). Against such a conception of a centralizing notion of power, and building on Foucauldian notions of distributed power that flows through individual bodies as well as institutions, Butler suggests that what is missing from this account is the psychic process within the individual that would prompt them to turn to this authority in the first place. "What conditions and informs that response? Why would the person on the street respond to 'Hey you there!' by turning around?...guilt and conscience operate implicitly in relation to an ideological demand, an *animating reprimand*, in the account of subject formation" (1997, 112-113). This is one of the paradoxes of subject formation for Butler; guilt or an "animating reprimand" ambivalently offers the very guarantee of social and political recognition of subjects in this case.

In a similar vein, paradoxically, carbon subjects come to register and have a say in the cultural politics of climate change through an "animating reprimand" that names them as guilty. "The average European emits around 11 tons per year, while the average American emits over 22 tons – more than 5 times the world average (4 tons) (Yarrow 2008, 8). "You" are interpellated through the finger-pointing exercise in which "you," the disproportionate emitter (with the American "you" as the worst) are named as having a footprint unbecoming "the planet's ability to reabsorb CO₂" (ibid.). Crucially, this finger-pointing is not achieved through a regulatory authority of law that exerts power over subjects, but through the conscience of a guilty governmental subject who willingly submits to the affective pull mediated through carbon footprint reduction lists in

examining their carbon conduct. While clearly not all of the fault falls on the shoulders of these individual carbon subjects, but rather accrues more systemically to broader social and economic orders, the feelings of carbon guilt engendered by the calculation of one's footprint are intensely individualized and domesticated, inviting personal atonement from carbon subjects on an atomic or household level.

Where and how carbon becomes 'visible' and manageable in their daily lives largely dictates how carbon subjects can allay their guilt and, in turn, bolsters certain orientations toward climate change solutions. I'd like to explore three key aspects of this feeling of carbon guilt. First, this feeling involves a repetitive everyday calculus of these subjects and their actions, whereby repeated performance further bolsters the effects of carbon subjectivity; second, it is launched simultaneously with an appeal to cost-saving on the part of the carbon subject, thereby yoking financial concerns with carbon footprint reduction; and third, even when all attempts are made by carbon subjects to lower their carbon footprints in this daily calculus, they will remain guilty subjects since they still will not have lowered their carbon footprints enough; some other mechanism will be necessary to dispense with the guilt. The mechanisms of offsets connect these guilty subjects to the nascent carbon markets as a key solution to climate change.

Iterative Everyday Acts of Reflexive Guilty Carbon Subjects

The trope of the carbon footprint in these lists offers myriad opportunities for subjects to atone for their feelings of carbon guilt. Those who turn toward the feelings engendered through this trope in these lists enact a form of carbon subjectivity whereby the many suggested behaviours and actions imply an individual or household calculus of everyday life. Advising on everything from the length of your morning shower and how to do your

grocery shopping to using a “rake or an electric leaf blower instead of a gas-powered one” (Government of British Columbia 2008, 117), the lists suggest that your carbon footprint is implicated in everything on a certain domestic front. You are invited (or in some cases, admonished) to participate, save money and enjoy doing your part through managing your carbon footprint (Yarrow 2008).

Some of the implications of these daily activities are easier to understand than others. Line-drying one’s clothes when one can, instead of using a clothes tumble dryer, for example, is suggested in most of the lists. The clothes dryer is fairly well-known as a particularly energy-intensive appliance, so mapping the idea of “carbon-intensive” onto this appliance seems an easy stretch. The calculus in this case is fairly straight-forward: drying your clothes on a line is a carbon, energy (and money, as the lists promise) saver. But myriad other activities related to household activities whose carbon is so embedded, often defy easy carbon accounting.¹⁰³ There is good news, however, according to Joanna Yarrow: “The fact that almost every area of human activity contributes to our carbon footprint might sound like an overwhelming problem. But the good news is that this gives us scope to reduce our footprint in almost every aspect of our lives” (2008, 8).

The sheer number of ways to reduce your carbon footprint as a checklist flattens out a range of diverse actions as if they were equivalent (having a shorter shower = buying an electric leaf blower instead of a gas-powered one) (Government of British Columbia 2008). Particularly amongst the extended lists, which often feature some gimmicky number of actions or behaviours – 52, 100, 101, or 365 ways to reduce your carbon footprint – such a high count necessitates looking at the carbon implications of a multitude of minor and major household undertakings as if ‘you’ are really going to do

one of these a day, or one a week in a systematic, check-list kind of way (Government of British Columbia 2008; Shimo-Barry 2008; Bohmholdt 2010; Yarrow 2008). These gimmicks reinforce the element of fiction or constructedness in the notion of carbon subjectivity. It matters little to this evolving form of subjectivity if every reader does each or few of the inventory; there is no test at the end of these lists to determine whether you can join “the club” of carbon footprint-reducing subjects. “You” are already in the club by responding to the hail (buying the book, reading the list on-line, performing a few of your duties as prescribed on the list). Nor even does it matter whether everyone reads these lists; enough people and organizations, including governments (Government of British Columbia 2008) subscribe to the value of these lists such that they become a powerful element in the discursive formation of carbon subjects. What *does* matter is the domestic and repetitive nature of the tasks that ensures: first, that carbon subjects are now recognized as individuals who can combat climate change on the home front; and second, that the many tasks require an iterative performance of carbon subjectivity that reinforces this domestic, individualized handling of climate change.

As Judith Butler notes, subject formation as an on-going process is achieved through repetition or performativity:

...performativity cannot be understood outside of a process of iterability, a regularized and constrained repetition of norms. And this repetition is not performed *by* a subject; this repetition is what enables a subject and constitutes the temporal condition for the subject. This iterability implies that “performance” is not a singular “act” or event, but a ritualized production, ritually reiterated under and through constraint... (1993, 95)

Insisting that there is no pre-constituted subject nor ever a definitively achieved subject, but only a ritualized production that shifts according to historical conditions, Butler

emphasizes the repetitive nature of subject production. The many repetitive daily acts suggested in the lists and the proliferation of such lists, reinforce recognition of individual subjects within a given social/political and historical order through which subjectivity unfolds. Butler suggests such an order as a “domain/field of intelligibility” which in part, constrains how subjectivity is performed (1990, 24). For Butler, ‘gender’ is that field of intelligibility, for climate change politics, I propose, ‘carbon’ presents the shifty field of intelligibility or what Foucault (1969/1989, 61) might call the “planes” from which a subject speaks and acts. Notably, carbon as a cultural element/trope in discourse (like gender) does not refer to an essential and unitary materiality or body; rather, carbon allotropically turns towards other non-essentialist bodies and entities; this turning means that a variety of practices enable the performance of carbon subjectivity. As I describe below, however, certain wider cultural norms come to constrain these affective connections.

This process of carbon subjectivity involves both psychic (or subject-internal) and social circuits of power whereby iterative calls to carbon subjects shape the discursive practices as acts of individuals in larger on-going public performance. The ambivalent process of carbon subject formation enables subjects to be recognized (or “to count”) within the shifty field of political intelligibility with respect to ‘carbon’. People must then respond repeatedly to the lists that hail them as responsible or “guilty” and perform an array of activities or duties that function both to make them feel less guilty in their own psychic terms and to outwardly appear to be contributing to a climate change solution. The list features an on-going animating reprimand from a social/political and psychic order through which subjects respond reflexively. The myriad ways in which one can

reduce one's carbon footprint in these lists suggests that one can address one's carbon guilt repeatedly and continually in potentially so many ways, thus reinforcing a circuit of carbon subjectivity.

Functioning as a support to this repetitive calculus of the list is the on-line carbon footprint calculator that emerged alongside or within these lists. Some of the book-length lists have a primitive carbon calculator inside (Shimo-Barry 2008, 8-9), while others propose that the first step in reducing your carbon footprint should be to go to one of the on-line calculators that they suggest (Bohmholdt 2010, 15-16). These calculators are quantitative and yet not precise, and they also involve iterative calculations. After an initial survey of "your" habits and practices, "you" are invited to come back after tweaking aspects of your daily life and return to check out the new numbers. Andrea Bohmholdt suggests in *101 Ways to Reduce Your Carbon Footprint*:

Once you have calculated your carbon footprint, document it and use it as a baseline number. After you have implemented the suggestions from this book, calculate your carbon footprint again. Then subtract your new carbon footprint from your baseline carbon footprint to determine the net reduction of emissions. You'll be amazed how all these minor changes add up. (2010, 16)

The metrics typically involve a complex calculation of household energy consumption, travel habits, dietary preferences and consumer habits; however, even as these calculations are complex, they also involve "calculative choices which can serve to render visible some things and invisible others" (Paterson and Stripple 2010, 350). Paterson and Stripple note two exemplary problems of complexity in these calculators that require "calculative choices" to resolve. The first pertains to "embodied energy" in products, or what I have referred to above through Grant (2008) as the "secondary carbon footprint," that leads to an impossibly infinite number of calculations (including, for

example, the transportation choices of the employees who worked in the production of an item). The second issue they note arises in the calculation of airline emissions, which are notoriously complex in that they also entail a calculation of the ‘multiplier’ effect on emissions based on the altitude of travel (Paterson and Stripple 2010, 350). These complexities are resolved, they suggest, through calculative choices that “systematically underestimat[e] the overall emissions individuals help to produce” (ibid.). Such calculative choices are not typically visible to carbon subjects who trust in the math and continue to reflexively perform.

The more one is hailed to perform some of these actions and behaviours, the more one comes to identify as a carbon footprint-making subject governing one’s own carbon conduct. Performance does not have to entail endless iterative attempts to quantify your carbon footprint through a carbon calculator (who does that anyway?), but it may involve thinking about the infinite tasks of daily life in the novel terms of carbon, and also considering the suggestions offered as footprint-reducing mechanisms. One carbon footprint calculator, for example, asks for a complex home energy audit requiring inputs from energy bills; at the bottom of the page, appears a tip about reducing your home energy carbon footprint (“put rugs on your floors” in order to make your feet feel warmer and thus prevent you from turning up the thermostat).¹⁰⁴ Each of the calculation pages similarly leads to a tip on that aspect of life, in effect, amounting to a carbon footprint reduction list. Such exercises require a psychic operation or inner dialogue that demands attention to the quasi-fictional, but practically relevant terms of carbon subjectivity as a way for individuals to appear and to governmentally regulate their carbon conduct within a larger calculus of climate change. The cultural practices associated with these carbon

footprint calculators reinforce normative distributions of the sensible in which liberal environmental tendencies of individualist consumer freedoms play major roles as solutions to ecological concerns as they track your domestic, consumer and travel behaviors (see, for example, <http://www.carbonfootprint.com/calculator.aspx>). These calculators bear mentioning for the ways in which they co-productively generate subjects through repetition as do the lists. What Paterson and Stripple call “carbon footprinting” or the use of carbon footprint calculators “serves to contribute to the production of reflexive subjects, reflecting on their carbon emissions and engaging in a sort of calculative practice – combining rough and ready calculations with constant evaluation of the practices that make up the numbers” (2010, 350).

Reducing footprints = reducing costs

One of the agendas most centrally featured in the carbon footprint reduction lists is the cost-saving one. As the following example from an on-line list suggests, often the metaphoric connections yoke the notion of saving money with carbon footprints more centrally than they connect with reducing greenhouse gas emissions:

Before moving onto the list, however, we would like to point out that *no matter what your stance is on global warming/climate change, these ideas at least stand the chance of saving you money*. Most of them don’t take that much effort and at the end of the month you may notice less coming out of your bank account to pay for utilities. (Pegg 2011)

Here, even climate change sceptics are hailed by an appeal to save money, so the assumptions of a belief in anthropogenic climate change and the will to reduce one’s role in this issue do not even appear as central to this aspect of carbon subjectivity. Similarly, the lead quotation at the beginning of this chapter suggests that the “easy ideas” for reducing your carbon footprint will also benefit your finances; indeed the subtitle of the

book - “365 Simple Ways to Save Energy, Resources, and *Money*” – intimately connects financially rewarding behaviour with lowering one’s carbon footprint. Carbon Footprint Ltd., a global carbon management company, also prefaces its list with the money-saving message (carbonfootprint.com nd).¹⁰⁵

In these and other lists (Bohmholdt 2010; Shimo-Barry 2008), the carbon footprint metaphor gestures at promoting often contradictory, loosely ‘conservationist’ behaviours in subjects through an appeal to those who respond to financial incentives. The message suggests that cost-cutting and carbon-cutting are congruous acts. The tensions in the remaining appeals in these lists reveal contradictions with what may be called a conservationist approach (at least as such an approach can be traditionally tied to less consumption). There are, for example, numerous appeals to buy more efficient consumer items (Bomholdt 2010, 43; Government of BC 2008, 117).

Carbonfootprint.com suggests that you “replace your old fridge/freezer (if it is over 15 years old), with a new one with energy efficiency rating of ‘A’”¹⁰⁶. Buying energy-efficient appliances does not as the discourse suggests, in and of itself reduce one’s carbon emissions. The quantitative metrics of carbon footprint analysis are highly variable and, if they entail a life cycle analysis (LCA) of all inputs and outputs, are extremely complex. If one must buy multiple energy efficient appliances over thirty years to replace an old one that lasted thirty years, carbon footprint accounting of GHG reductions and money saved, based reductively on energy consumed in the home, begins to feel suspect. Further, as characterized by the Jevons’ paradox (named after nineteenth century resource economist, William Stanley Jevons’ study of coal in Britain), higher energy efficiencies obtained through technological improvements are often associated

with *increased* consumption of technology energy/resources, despite widespread beliefs that efficiencies will inevitably lead to a net reduction in energy or resource use (Polimeni et al, 2008).¹⁰⁷ Once again, the quantitative and qualitative are enmeshed in these suggestions and while the metrics of emissions reductions are suggested in these reductive statements, a complex quantitative analysis does not (indeed cannot) play a central role in these lists. If it did, these metrics would complicate some of the suggestions on the list and the list would no longer be pithy in the ways demanded of this genre. My point here is not to insist that the metrics of the carbon footprint need be more definitive, but rather to suggest that the hint of a definitive scientific quantitative metric in this appeal to guilty carbon subjects coupled with normative consumer-oriented practices revolving around energy efficiency erase the metaphoricity of the carbon footprint and the political “filling” in of the imagination in particularly contradictory ways on these lists, as I describe below.

While some numbers accompany carbon footprint accounts in some lists (Shimo-Barry 2008; Berners-Lee 2011), it is often a qualitatively-potent, but quantitatively-weak appeal that often involves money-saving or financial gains that are associated with these carbon footprint reduction lists. This appeal to a financial realm of intelligibility for guilty carbon subjects helps the carbon footprint metaphor serve a variety of agendas by connecting carbon subjects to often contradictory consumer messages and behaviours. Most importantly, the affective connection between individualized appeals to lessen impacts and promises of cost-saving help to inscribe consumer-oriented and financialized responses as *the* ways for subjects to work towards climate change solutions and absolve guilt. These solutions not only urge subjects to see themselves as “consumers over

citizens” in response to environmental issues (Maniates 2002), they also buttress the normative distributions of the sensible of climate change politics (as outlined in Chapter One and Two) through institutionalizing a smooth transition to an offset economy of commodified carbon.

In his essay, “Individualization: Plant a Tree, Buy a Bike, Save the World,” Michael Maniates delineates how *the* (North) American contemporary response to environmental issues has been the individualization of responsibility due to the “...the core tenets of liberalism, the dynamic ability of capitalism to commodify dissent, and the relatively recent rise of global environmental threats to human prosperity” (2001, 33). Although his essay was written prior to the rise of carbon footprint lists, his critique of individualized responses - including lists like “50 Simple Things You can Do To Save the Earth” – in many way presages the arrival of carbon footprint reduction lists, which build on and accelerate an individualized, consumer-oriented response to climate change. Maniates identifies a historical “narrowing” of environmental imagination whereby the ability to foster multiple and contesting political responses to large-scale issues has been severely compromised under liberal mainstream environmentalism. “Although public support for things environmental has never been greater, it is so because the public increasingly understands environmentalism as an individual, rational, cleanly apolitical process that can deliver a future...without raising voices or mobilizing constituencies” (ibid.,41). Such a narrowing of imagination exemplified in carbon footprint reduction lists severely compromises the promising space of carbon subjectivity hinted at above. It is important to temper Maniates’ critique with the insights of Paterson and Stripple who, though critical of certain aspects of this governmentality, also suggest that “in a climate

change context, it is difficult to envisage how limiting global warming to 2 degrees C (emission reductions by 50-75% below 1990 levels by 2050) might be achieved without such an intensive, managerial (and self-managerial) effort” (2010, 359). Nonetheless, only rarely or marginally do these carbon footprint lists engage with articulations of the complex “relationships between individual and collective responsibilities to address climate change” (ibid., 347). For example, only on one of the last pages of her book does Joanna Yarrow suggest a range of behaviours that go beyond the individual domestic household calculus. On a page entitled “The Bigger Picture,” she suggests in five very brief bullet points, actions such as writing to an elected official and voting (2008, 122). Such a marginalization of these connections to wider systems and political institutions confirms Maniates’ critique of the narrowing of the imagination that reifies how carbon subjects can perform.

One telling exception to this lack of connection to wider political systems in these carbon footprint lists pertains to how the bodies of individual carbon subjects are affectively connected to the flows of the carbon market. What newly appears through carbon footprint reduction lists since the time of Maniates’ critique of other precursors to these lists, is an explicit engagement with the *feelings* of guilt and their removal through specific financialized and marketized mechanisms enshrined through the creation of the carbon market.

Dispensing with Carbon Guilt

SavingSpecies[.org] offers a way you can reduce your net carbon footprint to zero. Yup. That’s guilt-free! Simply donate to SavingSpecies to restore degraded forests for wildlife habitat. The trees soak up carbon. If we plant enough of them in your name, your net carbon production will be reduced to zero.¹⁰⁸

As this appeal from Saving Species.org attests, one of the central ways that affluent carbon footprint makers can allay guilt is through the purchase of off-sets within a newly established carbon market. This case above which draws into visibility the carbon sequestration work that trees can do for *you* to reduce your footprint to zero, is just one scheme among many that will financially neutralize the disproportionate emissions generated in *your* everyday life, through some project in a distant elsewhere. One gets the impression from the final line in this quotation, that there exists a virtual ledger or “naughty” list with *your* name in red that can be “simply” erased through a financial contribution. Harkening to the income-generating practices of the Catholic church in Europe during the Middle ages, carbon offsets have been likened to the selling of “indulgences” by Catholic “pardoners” to dispense with sins:

Many centuries later, there are new indulgences on the market in the form of carbon offsets. The modern-day Pardoners are companies like Climate Care, the Carbon Neutral Company, Offset My Life and many others. These self-styled ‘eco-capitalists’ are building up what they claim are ‘good climate deeds’ through projects which supposedly reduce or avoid greenhouse gas emissions. These wholesale emissions reductions can then be profitably sold back at retail prices to modern-day sinners who have money, but not necessarily the time or inclination to take responsibility for their emissions, and can afford to buy the surplus ‘good deeds’ from the offset companies. (Smith 2007, 5)

Elaborating upon the trope of dispensation for carbon guilt through a series of metaphors – “carbon sinners”, “good deeds” and “pardoners,” this introduction to an analysis of carbon offsets by Carbon Trade Watch reveals a key affective economy at play in this practice.

The carbon footprint metaphor is intimately yoked to these income-generating, guilt-dispensing financialized practices as this metaphor has come of age alongside carbon markets. As mentioned in Chapter One, the discursive currency of the carbon footprint

metaphor peaks in 2007-08 with the eruption of a global carbon market that was enshrined through the Kyoto Protocol. According to World Bank data, the carbon market increased almost six-fold, from \$11 billion U.S to \$64 billion,¹⁰⁹ over the three year period from 2005-2008 during which the carbon footprint metaphor obtained viral status. Entwined with the governmental politics of carbon footprint metaphors is the recognition of carbon subjects as individual investors in novel projects and initiatives of the carbon market, for the appeals in many of these metaphors involve the promise of erasing their carbon footprints and subjects' feelings of guilt through paying for offsets.

Whereas the suggestions to mobilize oneself in non-marketized community politics or electoral politics receives marginal treatment (if at all) in carbon footprint reduction lists, the notion of offsets often occupies a more prominent role at the beginning of these texts. In the introduction to her book, Yarrow offers, “[t]he idea of offsetting our carbon emissions by avoiding the release of, or removing from the atmosphere, an equivalent amount of greenhouse gas somewhere else is becoming increasingly popular” (Yarrow 2008, 9). Similarly, while Bohmholdt acknowledges that it is necessary to do all you can “through conservation and energy efficiency” to reduce your carbon footprint, offsets can also help. “Carbon offsets are commodities bought and sold in a voluntary market in the United States. The idea is to invest in an emissions-reduction project somewhere in the world to equivocally offset or reduce your carbon footprint” (2010, 16). The website ClimatePath.org features the following endorsement for offsets as a means of reducing your carbon footprint:

In the US, we account for 20% of man-made greenhouse gas emissions, with less than 5% of the [global] population. What if the other 95% all lived like we do? Footprint reduction through conservation and smarter consumer choices is critical, but most of us will still be far above a level that is sustainable for the

planet. Without using offsets, there is no way to close this gap.¹¹⁰

This discourse hails a particular (American or equally guilty other) carbon subject, who will, through the statistics cited, understand that they are guilty of greater wealth and emissions than can be tolerated for the world at large. Although “we” have tried our best through tinkering with our lightbulbs and buying ‘smart’ energy efficient appliances, we still cannot do what is necessary for sustaining life on the planet, so we must buy offsets. As this passage suggests, despite the offset, “we” are still living a lifestyle that is unsustainable for existing life on the planet, which raises the question, *what is the offset for?*

The hail from Climatepath.org contains an implicit paradoxical admission that “we” appear in the politics of climate change as carbon subjects who can speak and act only through the very inequities that make us guilty. The implication is that if everyone were to equally become carbon subjects as “we” are, that is guilty consuming subjects with fossil fuel intensive lifestyles, sustaining existing life on the planet would be impossible. Implicit in this appeal to buy offsets then, is an appeal to invest in preserving an asymmetrical geo-political *status quo* that ensures that “we” still appear as carbon subjects. The companies in the offset game to whom carbon subjects entrust their emissions dispensation and the preservation of their status, affectively attach these emissions to others through a series of hidden “calculative technologies” (Paterson and Stripple 2010, 352) These technologies include calculations of: “baseline emissions” that would occur without projects and relatedly, the “additionality” of the project in the creation of novel emissions reductions; “verification” of anticipated emissions reductions; “systems of certification” through which the Kyoto Protocol’s Clean

Development Mechanism (CDM) operate; and “legal/contractual infrastructure: through which carbon units are exchanged (ibid.). Such largely experimental calculative technologies and the struggles and failures involved in the agonizing process of what Donald MacKenzie (2009) calls “making things the same” remain largely invisible to carbon subjects in this process. Reducing carbon footprints through offsets necessarily entails a reduced picture for carbon subjects whereby they can pick an offset project from among a few choices without engaging with the tensions involved in these projects and whether or not they “succeed,” even by their own terms.

Climatepath.org promises to help ‘you’ reduce your carbon footprint through choosing the right carbon offset project. One of the off-set projects carbon subjects may fund to reduce their carbon footprint is an energy-efficient cook stove project in Cambodia.¹¹¹ This seems an important project that makes charcoal stoves more efficient, thus reducing the amount of wood and charcoal involved in the cooking process, reducing the need to cut down trees and importantly, making cooking conditions safer for Cambodians; however, this offset project also makes it possible for carbon subjects in North America to deflect their own guilt for large carbon footprints to those remote from them. The per capita carbon ‘footprint’ as a measure of an average Cambodian at .84 tons CO_{2e}/year is a great deal smaller than that of an average North American at 17-19 tons CO_{2e}/year,¹¹² and yet, carbon subjects in North America can, through helping make Cambodians’ stoves more efficient, reduce their own virtual footprint without more thoroughly examining their own emissions-producing lifestyles. Also noteworthy in this process is the way in which the carbon subject’s global position is assured: “This developing world “low tech - clean tech” approach has significant benefits to both people

and the planet.”¹¹³ A geo-political divide between the global North and South is preserved as the “developing” South are the beneficiaries of ‘low-tech’ solutions while the developed world retains its high-tech fossil fuel intensive lifestyle. “As to subjectivity... this produces what might be called a ‘carbon displacer’ – a subject who simply displaces onto others (via a monetary exchange) the responsibility for reducing overall collective emissions” (Paterson and Stripple 2010, 352).

The affective economy of guilt and the means for allaying this guilt for carbon footprint makers dispenses carbon through a trick of the market, rather than through its actual reduction in the atmosphere or through creating socio-political alternatives to ecologically damaging lifestyles. Offsets ensure a sustained commodification of carbon (an analysis of this commodification will be further elaborated in Chapter Five), but they offer no guarantees in the way of emissions reductions, especially if they are pitched in this way to carbon subjects who can avoid more substantively changing. With the click of a few buttons, an “armchair” carbon subject can comfortably rest assured that s/he has dispensed with the guilt through helping to finance a clean energy initiative which might also appear as a charitable project that will “contribute more positively to development in the South” (Paterson and Stripple 2010, 352).

The guilty feelings of carbon footprint- making subjects thus function to support an affective circuit which not only defers more substantial reductions that are beyond individual subjects and their footprints, but serves to bolster a normative distribution of the sensible of liberal environmentalism characterized by asymmetrical relations and questionable results in terms of emissions reductions. As Clive Spash insists, the offset industry “has created a powerful institutional structure which has many vested interests

whose opportunities for making money rely on maintaining GHG emissions, not reducing them” (2010, 191).

While guilt may be a partly productive feeling if it moves outward to responsibility towards others (like global citizens as theorized in the following chapter), its governmental production through carbon footprint lists, and the associated mechanisms that support dispensation through offsets, generate a problematic economy of a/effects. By yoking together markets and carbon and footprints, these lists and offset opportunities generate coherence in a variety of settings for the globally dominant market regime of solutions to climate change. This normative distribution of the sensible of carbon carries through as a risk that tempers other carbon footprint metaphors, even as these other metaphors promise to make visible key connections with global citizens and other ecological actors as I suggest in Chapters Four and Five.

As Maniates argues, “...legitimizing notions of consumer sovereignty and a self-balancing and autonomous market...diverts attention from political arenas that matter. In this way, individualization is both a symptom and a source of waning citizen capacities to participate meaningfully in processes of social change” (2001, 44). Understanding an affective economy in which the carbon footprint serves to excite individual guilt, only for such guilt to serve market mechanisms that work to absolve it, prompts examination of the limits of the metaphor inasmuch as it allows carbon subjects to evade collective political action, and permits political institutions like nation states and transnational corporations to indefinitely defer more robust political responses to climate change. The sum of climate change politics is greater than its individual carbon subjects because power flows through systems and institutions that must also be considered a part of these

politics. Not only have such institutions not normally been “subject” to the hails of carbon footprint reduction lists, these institutions also often make use of these very individualized carbon footprint makers to shore up their own problematic logic.

The emergence of carbon subjectivity in the opening decade of the new millennium through carbon footprint reduction lists must be read as an ambivalent trace that haunts the opening of a promising space for newcomers in the cultural politics of climate change. Since 2008-2009 new publications of print-based book lists have dwindled, though the first ones published are still in print and widely available. At first glance, one may speculate that the reason for the decrease in this list genre is that the carbon footprint metaphor is now hackneyed to the point of irrelevance, that it is now history. Yet this metaphor is still proliferating in different forms such that it cannot be read as past history. Understanding this genre’s historical importance suggests that perhaps what was historical was the initial hailing of a carbon subject, now a ‘done-deal.’ If a more recent award-winning title is any indication, the genre seems to be shifting slightly by assuming that the reader knows more about climate change and wants to do something about it, and also that the ideal reader is *already a carbon subject*. The book *How Bad are Bananas: The Carbon Footprint of Everything* (Berners-Lee 2011) does not explicitly suggest a “you” as the carbon footprint maker, but rather inverts the formula, suggesting that activities or “things” like bananas and text messages have carbon footprints (such a shift of footprints away from humans also carries risks that will be addressed in Chapter Five). This inversion, however, still implies a “you” who are consuming such things and in many ways, have already become a carbon subject. The text inside the book appeals to “you” defined at the outset as “people who want to love

their lives and for whom that now entails having some carbon awareness alongside everything else that matters to them” (Berners-Lee 2011, 3). By presenting certain data on the carbon footprint of items and activities, Berners-Lee suggests an ideal carbon subject with a range of choices that *might* inform a decision to lower their greenhouse gas emissions. The analysis is more explicitly quantitative in this book, providing a number in weight of carbon dioxide equivalents emissions generated by each activity or item; although as mentioned previously, this author launches his explanation of a carbon footprint with an acknowledgement that the footprint is a *metaphor*, as explained previously. Despite the differences in this more recent text in the list genre, however, what remains clear, is that the carbon subject implied, this person who wants to ‘love life’ is a consuming guilty subject with the freedom to choose.

While affectively bringing individual carbon subjects into visibility through carbon footprint reduction lists might seem promising for well-intentioned carbon subjects, Maniates warns that a more robust political stance might remind that “their individual consumption choices are environmentally important, but that their control over these choices is constrained, shaped, and framed by institutions and political forces that can be remade only through collective citizen action” (2001, 50). In what circumstances might the carbon footprint metaphor connect with such a politics of citizenship and what are the promises and risks of this metaphorical shift beyond the carbon subject?

Chapter Four Carbon Citizenship: A Politics of Human Connectedness

Given the interest in the carbon footprint (CF) of products, services, companies, and investment portfolios, there have been surprisingly no consistent comparative studies to understand our collective carbon footprint on a national or global level. What consumption categories cause the CF? *How does the contribution of different activities vary across regions and stages of development?*¹¹⁴

As the above excerpt from Hertwich and Peters' (2009) "Carbon Footprint of Nations" report suggests, carbon footprint metaphors offer the potential to make visible complex political connections of togetherness and difference, relative responsibility and rights across national and global scales. In order to trouble a singular reading of carbon footprint metaphors through the limited frames of carbon subjectivity, this chapter advances an analysis of carbon footprint metaphors implicating a different political shift beyond the individual. As the metaphor shifts over time and in space, different textual contact zones reveal the ways in which these metaphors bind diverse bodies and flows in affective political world-making. In the above quotation and the report from which it is extracted (described below), carbon footprint metaphors suggest the promise of evoking a form of *carbon citizenship*, drawing together people into a global collective of carbon flows, but also significantly drawing distinctions between certain nations, sectors and "consumption categories."

In proposing carbon citizenship, I am drawing on contemporary notions of ecological citizenship that promote a reorientation of the concept of citizenship in the context of contemporary ecological politics (2003). Citizenship, as influenced by the canon of political theorists from Aristotle through to Rousseau, traditionally connotes

legal rights conferred upon individuals by a polity (political community, traditionally conceived as a state) and the legal responsibilities that these individuals in turn uphold as members of a polity. Thus, one might think of the rights and responsibilities of passport-carrying citizen members of nation-states as the contemporary terrain upon which citizenship unfolds. As Hartley Dean suggests, however, “emergent ecological concerns,” at a global scale require expanding the “potential scope of citizenship” beyond these traditional conceptions (2001, 491). A growing number of scholars of environmental politics are turning to citizenship as a crucial notion for engaging with rights, responsibilities and political community in an unevenly constituted global world of limited resources and ecological degradation where traditional boundaries of citizenship are transgressed (Dobson, 2003, 2004, 2006; Latta 2007 a, 2007b; Smith 2005; Valencia Saiz 2005; Woolf et al 2009). The debates among these scholars suggest that although the “term ecological citizenship is not univocal” (Melo-Escriheula 2008, 114). Ecological politics have reinvigorated citizenship as an important conceptual frame that centers notions of rights, and responsibilities of individuals as members of a political community, though perhaps not from a contractual or specifically nation-state centered perspective, as I elaborate below. For the purposes of my analysis of carbon footprint metaphors, I focus on the theorizations of Andrew Dobson and Alex Latta as these help animate the textual contact zones in particular ways that will become clear in what follows.

What I am calling “carbon citizenship” gestures at emerging forms of political community, rights and responsibilities in the politics of climate change which take carbon, and particularly the carbon footprint metaphor as a central term through which membership might be determined. As I develop throughout this chapter, the affective

mediations of the carbon footprint metaphor in the textual contact zone from which the above quotation is extracted draw together these kinds of citizenship associations and practices. By calling on this notion, I am borrowing from the promises of what Andrew Dobson calls “ecological citizenship” (2004), a form of citizenship which explicitly recognizes global asymmetries in terms of access to resources, contributions to and inheritances of ecological degradation. The politics of connectedness to fellow carbon citizens through carbon footprints may thereby act as a catalyst to climate justice initiatives which begin by acknowledging inequalities, and attempt to foster equitable sharing of carbon resources and making reparations for degradation. As Alex Latta outlines, however, the notion of “ecological citizenship” does not, unto itself, carry forward this agenda; ecological citizenship in practice involves contestation over: how “nature,” in this case, carbon is politicized; and the citizenship regimes in which this form of citizenship unfolds (2007a). As the following analysis reveals, carbon footprint metaphors in these contact zones reveal the tensions between carbon citizenship regimes and practices which both promise to rectify inequalities and to lower emissions, and those that reinscribe pre-existing inequalities and do little, if anything to reduce emissions. Thus, carbon citizenship, like ecological citizenship, might serve as a site from which to critically examine the “active politicization of the human-nature and human-human relationships that coalesce in various socio-ecological orders” (Latta 2007b, 378).

Importantly, subjectivity and citizenship here are not strictly discreet political concepts, nor crucially are certain carbon footprint metaphors singularly indicative of one or the other; the traces of individual-oriented subjectivity and carbon guilt as theorized in the previous chapter haunt the promises of carbon citizenship here. Parsing them in this

way, however, entails a politics of making visible certain human struggles involved in climate change. Whereas the first textual contact zone I draw attention to above highlights a global citizenry through which a platform of global climate justice could be attempted, the latter part of the chapter highlights a textual contact zone in which carbon footprint metaphors attach to neo-liberal citizenship regimes promoting consumption and accelerated fossil fuel development. The story of carbon citizenship as it unfolds through carbon footprint metaphors is therefore riddled with tensions. I explore the potential of carbon citizenship expressed through carbon footprint metaphors as an open-ended locus of contested membership and actions in a commonly-constituted shifting world of carbon relations and processes.

TABLE 2. Per Capita GHG Footprint of Nations in 2001

country	footprint (tCO ₂ e/p)	domestic share	population (million)	construction*	shelter*	food*	clothing*	manufactured products*	mobility*	service*	trade*
Albania	2.5	61%	3.4	9%	13%	35%	3%	6%	17%	10%	8%
Argentina	6.5	88%	37.5	4%	12%	39%	3%	6%	18%	12%	6%
Australia	20.6	82%	19.4	9%	21%	16%	2%	8%	16%	16%	11%
Austria	13.8	48%	8.1	7%	17%	12%	3%	15%	28%	16%	5%
Bangladesh	1.1	86%	132.1	7%	13%	55%	3%	4%	6%	11%	0%
Belgium	16.5	46%	10.3	8%	17%	14%	5%	19%	25%	14%	3%
Botswana	5.1	54%	1.6	10%	8%	31%	1%	11%	11%	26%	2%
Brazil	4.1	88%	172.3	6%	5%	43%	2%	7%	19%	15%	4%
Bulgaria	6.1	81%	8.1	7%	32%	14%	1%	4%	10%	28%	7%
Canada	19.6	75%	31.2	8%	18%	8%	2%	9%	30%	18%	6%
Chile	4.9	73%	15.4	8%	11%	26%	6%	10%	27%	12%	5%
China	3.1	94%	1269.9	25%	12%	27%	3%	10%	8%	15%	2%
Colombia	3.4	89%	43.0	5%	7%	45%	2%	5%	15%	16%	5%
Croatia	6.9	66%	4.4	4%	28%	20%	2%	15%	21%	11%	2%
Cyprus	15.9	46%	0.8	17%	13%	16%	5%	12%	21%	10%	7%
Czech Republic	10.8	75%	10.2	2%	34%	15%	2%	11%	13%	22%	3%
Denmark	15.2	68%	5.3	11%	24%	12%	4%	10%	34%	18%	5%
Estonia	12.4	78%	1.4	5%	49%	9%	1%	9%	15%	18%	1%
Finland	18.0	67%	5.2	8%	24%	12%	2%	13%	18%	16%	9%
France	13.1	64%	59.5	8%	19%	16%	3%	16%	19%	16%	4%
Germany	15.1	63%	82.0	8%	22%	13%	4%	11%	22%	17%	5%
Greece	13.7	65%	10.6	14%	16%	19%	3%	10%	18%	15%	5%
Hong Kong	29.0	17%	7.2	13%	8%	7%	28%	20%	11%	9%	7%
Hungary	9.5	76%	10.0	6%	35%	14%	1%	9%	14%	19%	6%
India	1.8	95%	1032.1	8%	14%	41%	3%	9%	12%	10%	3%
Indonesia	1.9	89%	213.3	8%	20%	28%	1%	4%	22%	16%	1%
Ireland	16.0	56%	3.8	9%	15%	20%	3%	7%	23%	17%	8%
Italy	11.7	62%	57.5	9%	16%	14%	4%	15%	20%	16%	6%
Japan	13.8	68%	126.8	14%	12%	11%	4%	15%	22%	18%	8%
Korea	9.2	75%	47.6	11%	15%	12%	3%	12%	32%	19%	7%
Latvia	6.7	58%	2.4	8%	23%	18%	2%	12%	21%	18%	7%
Lithuania	5.9	59%	3.7	7%	21%	20%	2%	11%	19%	17%	9%
Luxembourg	33.8	56%	0.4	10%	14%	11%	2%	17%	51%	11%	3%
Madagascar	1.5	90%	16.0	3%	7%	59%	2%	1%	5%	22%	0%
Malawi	0.7	83%	11.3	1%	15%	26%	1%	8%	6%	41%	3%
Malaysia	4.2	81%	23.7	9%	17%	12%	1%	13%	31%	25%	2%
Malta	13.0	35%	0.4	2%	24%	12%	2%	17%	19%	21%	3%
Mexico	5.6	77%	100.9	9%	12%	18%	3%	11%	29%	14%	4%
Morocco	1.9	73%	29.2	15%	12%	22%	1%	8%	12%	29%	2%
Mozambique	1.1	86%	18.0	6%	11%	46%	1%	2%	5%	28%	2%
Netherlands	16.7	53%	16.0	8%	18%	12%	3%	14%	21%	23%	7%
New Zealand	11.4	69%	3.8	7%	15%	19%	3%	10%	21%	16%	14%
Norway	14.9	44%	4.5	6%	7%	15%	3%	14%	28%	21%	6%
Peru	2.6	83%	26.1	7%	7%	37%	4%	6%	20%	13%	6%
Philippines	1.9	76%	79.9	8%	13%	36%	1%	5%	17%	17%	4%
Poland	8.7	87%	38.7	6%	31%	18%	1%	10%	16%	13%	8%
Portugal	10.8	60%	10.0	18%	9%	20%	4%	12%	15%	19%	4%
Romania	5.2	84%	22.3	7%	33%	17%	1%	11%	17%	15%	2%
Russian Federation	10.1	92%	145.7	9%	40%	15%	1%	3%	16%	17%	1%
Singapore	24.1	36%	3.3	9%	11%	8%	2%	24%	28%	21%	11%
Slovakia	8.0	68%	5.4	11%	28%	18%	2%	12%	15%	19%	3%
Slovenia	11.9	64%	2.0	13%	15%	15%	2%	10%	26%	20%	4%
South Africa	6.0	90%	43.4	5%	21%	21%	2%	10%	17%	15%	9%
Spain	10.9	65%	39.4	14%	14%	17%	3%	12%	21%	12%	10%
Sri Lanka	1.4	67%	19.4	8%	12%	27%	3%	8%	20%	19%	4%
Sweden	10.5	54%	8.9	9%	12%	16%	3%	12%	29%	23%	6%
Switzerland	18.4	36%	7.2	6%	19%	11%	3%	15%	26%	13%	6%
Taiwan	11.3	68%	22.3	10%	17%	14%	2%	16%	21%	15%	7%
Tanzania	1.2	90%	34.5	1%	22%	45%	2%	3%	5%	21%	2%
Thailand	3.2	78%	62.8	11%	12%	21%	4%	8%	25%	17%	2%
Tunisia	3.0	68%	9.7	11%	15%	21%	4%	12%	21%	14%	4%
Turkey	4.6	82%	66.2	9%	15%	27%	3%	10%	24%	9%	5%
Uganda	1.1	91%	22.6	4%	9%	61%	0%	1%	6%	16%	3%
United Kingdom	15.4	62%	59.3	7%	21%	14%	3%	15%	22%	10%	11%
United States	28.6	82%	277.5	7%	25%	8%	3%	12%	21%	16%	8%
Uruguay	6.8	77%	3.4	5%	3%	59%	3%	6%	12%	9%	3%
Venezuela	8.1	88%	24.7	7%	10%	20%	3%	11%	32%	11%	7%
Vietnam	1.7	80%	79.5	20%	15%	40%	1%	6%	8%	12%	1%
Zambia	2.1	88%	10.3	2%	5%	67%	1%	3%	5%	18%	1%
Zimbabwe	2.0	79%	12.3	3%	20%	38%	3%	6%	12%	16%	4%

* Contribution of different consumption categories.

Figure 2: The Carbon Footprint of Nations

The textual contact zone “Carbon Footprint of Nations” report (Hertwich & Peters 2009) from which the lead quote and previous figure are excerpted, implies that when carbon subjects emerge, they must be aggregated to a larger scale through comparative analyses that take into account nations, sectors, and relative stages of development in a globalized calculus of impacts. Though this particular report does not explicitly mention ‘citizens,’ it gestures toward a complex multi-scale locus of citizenship, conceived in terms of nation-states as theoretical units that operate within and against other scales and through the complex flows of carbon through trades of goods and services. This particular instance of the metaphor demands close attention as it gets taken up in influential spheres of the unfolding politics of climate change where it affectively mediates connections to international policy discussion. The “Carbon Footprint of Nations” (2009) report is found on the web site carbonfootprintofnations.com and also appears in the respected, peer-reviewed journal, *Environmental Science and Technology* where it received the Top Environmental Policy Paper of the year award (2009). Notably, while the usual life span of such journal articles is somewhat limited, this article remained in the top three downloaded papers of this journal even three years after it was published, surpassing even more recent articles on significant issues like the Fukushima nuclear disaster following the 2011 earthquake and tsunami in Japan.¹¹⁵ The number of visits to their website (78 000 from 2009-2012 in the three years following release of the report) reveals a further audience that extends well beyond the usual limited academic dispersal.¹¹⁶ The authors of this report, Edgar G. Hertwich and Glen P. Peters, and contributors to this metric as developed on the carbonfootprintofnations website rank among a veritable ‘who’s who’ of policy-informing emerging experts on global carbon

governance.¹¹⁷ As such, their policy-oriented papers represent a key arena in which carbon footprint metaphors make profound impressions in the evolving politics of climate change.

Lest it appear that I am claiming that these ‘experts’ are singularly responsible for drawing these problematic relations and global asymmetries into visibility in this report, I contend that the authors are rather responding to the agency of many players in the global climate negotiations whose voices have loudly proclaimed the injustices built into the issue of climate change. At each round of these negotiations, voices from the small island states, represented by the Alliance of Small Island States (AOIS) have critically highlighted the need to re-direct attention toward fast emissions reductions on the part of the global north and reparative funds for adaptation and/or relocation for these states that (<http://aosis.org/>) The Africa Group of nations has “focused on poverty eradication and environment as two intertwined issues” that are important to their nations and have received little attention in negotiations (Makina 2013, 42). Bolivia has led, along with the Indigenous Environmental Network (IEN) in critically assessing what they call “false solutions” of carbon markets. Such actors have highlighted that the dominant market-based approaches to climate change as the problem, not the solution. Speaking on behalf of the nation of Bolivia, Ambassador Pablo Solon has suggested:

We have seen proposals for markets for the oceans, so called ‘blue carbon’ we are surprised and concerned by these. The problem with the reference level for markets such as these is that it is based on assumptions that are not real. And there is the great possibility that the new market mechanisms will just create more hot air...With parameters that are not real, countries try to get a bigger share of certificates of reductions and in that way, instead of developing new sources of finance, we will develop new sources of deterioration of our natural systems. (Solon as cited in World People’s Conference Press Release 2011)

This report then, rather than being the unique intervention of its authors, brings together a number of important actors through the carbon footprint metaphor to highlight problematic asymmetries and wealth-linked emissions.

As Figure 3 reveals, the main data set of this report is presented as a one-page list of carbon footprints of eighty countries. The carbon footprints on this chart have been calculated in terms of per capita tonnes of carbon dioxide equivalent emitted in this data year. On the x axis are the alphabetized names of these 80 countries and the initial 3 categories on the y axis are “footprints” measured in CO₂ equivalents, followed by “domestic share” (ie how much of those emissions originate domestically) and national “population.” The following 8 columns provide a breakdown of the percentage of that footprint contributed by each ‘consumption category’ – construction, shelter, food, clothing, manufactured products, mobility, service and trade. The *per capita* measure of footprints thus situates national citizens bound together in a larger-scale population as members of a larger political group. This textual contact zone introduces a novel play of possibilities through the carbon footprint metaphor; whereas this metaphor in the previously introduced contact zone played mostly into an individual often private and immediately marketizable agenda, the metaphor here introduces common interests that may not (immediately) be dealt with through engagement with markets. I will analyze the promises of carbon citizenship enabled by what this report makes visible, after situating the pivotal role of the carbon footprint metaphor as a connecting thread to citizenship theory and practice.

Metaphoric Attachments of Citizenship and Carbon: Creating ‘fellow feeling’

As mentioned above, citizenship conventionally connotes membership in a commonly ascribed “polity” or political space/unit where individual rights and responsibilities are worked out in terms of a wider membership of citizens to foster (theoretical) equality among members. (Isin and Turner 2002). Citizenship is, however, a theoretical, even metaphorical notion that shifts in both theoretical and practical terms. “While citizenship is certainly a legal status conferred by a state to members of its political community...citizenship [is also] a moral category and a social (as well as political) identity” (Wolf et al 2009, 504). The ways in which I take up citizenship in this chapter more closely adhere to the notion of citizenship as a moral category and political identity or membership with an emphasis on: the role of affect and relatedly, metaphor in generating political membership; and the role of carbon and wider ecological-materiality as they shape communities of citizens.

The first key to the carbon citizenship I am conceptualizing is the role of affect. Attaching a carbon footprint to global citizens “contribute[s] to forming particular communities of feeling or collective bodies” (Zembylas 2014, 370). Michalinos Zembylas draws attention to the “affective means” through which citizenship unfolds in “aligning the individual and the collective” (ibid., 380). These affective mediations can disrupt hegemonic norms of citizenship or they can serve to bolster them through, for example, nation-oriented “sentimentality” that binds certain people together through “commitment to particular values” that serve not only to bind community together but to set the community apart from other people (Zembylas 2014). Critically, as Sarah Ahmed insists, understanding affective community-building through what I’ve been calling

textual contact zones entails attention not only to how bodies are affectively brought together through these contact zones, but to how certain bodies are drawn away from other bodies in relational encounters. Affects “involve (re)actions or relations of ‘towardness’ or ‘awayness’”(Ahmed, 8). In his description of “ecological citizenship,” which echoes Rancière’s thoughts on citizenship inclusions/exclusions as described in Chapter Two, Alex Latta insists, “[w]hile it might seem natural to think of citizenship in terms of an inclusive practice, as that which binds together a diverse multitude. Inclusion is only comprehensible in terms of its opposite: *exclusion*” (2007b, 389).

In this chapter, I explore how carbon footprint metaphors situated in citizenship discourses create communities of “fellow-feeling” (Ahmed 2004, 8-10) whereby certain human bodies are drawn together and others apart, highlighting similarities and differences. As Ahmed explains, fellow feelings “should not be regarded as psychological states, but as social and cultural practices” that bind communities together creating the very surfaces that shape communities and the bodies that belong (2004, 9-10). As well as insisting that feelings do not belong to psychologized individual selves, Ahmed emphasises that feelings are implicated in relations of movement or circulations of objects/texts that are “sticky, or saturated with affect, as sites of personal and social tension” (ibid., 11). Affect thus works through the “‘sticking’ of signs to bodies” (ibid., 13). As my textual contact zones reveal, carbon footprint metaphors in circulation become saturated with affects and stick to bodies to produce particular political effects; movement and attachment are key to the forms of citizenship possible and the actions enabled:

The relationship between movements and attachment is instructive. What moves us, what makes us feel, is also that which holds us in place, or gives us a dwelling

place. Hence movement does not cut the body off from the ‘where’ of its inhabitation, but connects bodies to other bodies: attachment takes place through movement, through being moved by the proximity of others (Ahmed 2004, 11).

Ahmed’s case studies of discourses of hate and racism reveal that what it means to be “British” in these discourses relies on discursively connecting certain bodies together and repelling others as non-citizen others. In generating attachments through affective politics, citizenship discourses and practices rely on metaphors as they circulate to generate proximity between bodies to create continuities and discontinuities “in place.” In terms of ecological or carbon citizenship, as I describe below, the ecological or carbon flows disturb conventional notions of citizenship as a nation-centred locus of dwelling. Carbon flows in natural-cultural circulations that are at once planetary and intra-planetary involving transnational processes; carbon citizenship attends to how these flows generate proximities among people. Sometimes these flows may be theorized in terms of national territories, but they also always exceed such boundaries as I elaborate below. .

The metaphorical aspect of this carbon footprint deserves special attention in this instance of citizenship for how it gestures toward a kind of pedestrian traffic of footprints across complex scales. The fact that footprints indicate *movement* is one of the strengths of these metaphors; no footprint remains neatly in place and time. Criss-crossing global footprints often overlap such that footprints are not cleanly ‘of’ or from one person, region, nation, sector. This is equally true of the ecological footprint and the carbon footprint; despite a very rigorous quantitative and empirical foundation to the ecological footprint based in the ecological science of carrying capacity, the *metaphor* of the footprint foundationally interrupts attempts to render carbon relations and processes as stable and accurate. There is simply too much traffic between ecological actors for any

one actor-species, even if uniquely endowed with something called *sentience*, to definitively account for all of the movement. While this movement might be difficult to grapple with through the conventional architecture of citizenship as I describe below (Hayward, 2006), it is a necessary corrective to notions of human-constructed stable architectures of citizenship at a time of rapidly shifting ecologies and climates. An excess of material relations and processes remains at the centre of this metaphor as a political site of struggle; however, because carbon as a trope plays for a variety of agendas, this struggle also implicates certain problematic neo-liberal citizenship regimes as I describe further below.

The textual contact zones in which these metaphors appear reveal the tensions of ‘fellow feeling’ at play. The first textual contact zone offers the promise of creating fellow feeling among global carbon citizens who are (in theory) deserving of an equitable share of carbon emissions. The second textual contact zone that I explore later in this chapter reveals an especially emotionally-charged nation-oriented case of carbon footprint metaphors in which Canadian citizens are affectively pulled toward supporting problematic resource development in Canada because ‘our’ nation’s practices are deemed to have a lower carbon footprint and to be more ethical than those of geo-political others. Such cases reveal “affect as necessary for constituting collective identity and for participating in social and political action” that have important implications for citizenship (Zembylas 2014, 370). Fellow feelings “...not only contribute to forming communities of feeling or collective bodies, but are also mobilised for the polity to uphold firm emotional commitment to particular values such as patriotism and citizenship” (ibid., 369). Understanding how carbon footprints connect citizens in

communities with/against others and the political actions that flow from such citizenship orientations demonstrates a complex politics of affect at work.

In the first textual contact zone excerpted above, the carbon footprint metaphor mediates an affective connection between numbers and notions of membership in a global context where nations differ greatly in their per capita emissions. Although the data set is from 2001, the article was only released in 2009, after the emergence of the carbon footprint metaphor, as if the numbers were just waiting for this metaphor to make sense of it all. While the general tone throughout the report and on the website reflects the authors' insistence on the quantitative nature of their carbon footprint analysis, their story depends heavily on metaphoricity as a way of making sense of a complex node of entwined facts, values, politics and ecologies. Indeed the lead paragraph of the article begins not with the data, but with a kind of popular poetics of the carbon footprint metaphor (which they notably call a "concept"):

The concept of a carbon footprint captures the interest of businesses, consumers, and policy makers alike. Investors watch the carbon footprint of their portfolios as an indicator of investment risks. Purchasing managers are curious about the carbon footprint of their supply chains, and consumers are increasingly offered carbon-labeled products. Carbon footprints have become popular in spite of the term being a misnomer; it refers to the mass of cumulated CO₂ emissions, for example, through a supply chain or through the life-cycle of a product, not some sort of measure of area. (Hertwich and Peters 2009, 6414)

Hertwich and Peters, policy analysts who are most definitely in the numbers game, insist that the footprint is a mass of emissions rather than the measure of area implied by a literal footprint. What they miss by calling this 'term' a misnomer, however, is the very metaphoricity that captures the interest and imagination of so many and that enables it to serve a variety of agendas through shifty affective mediations. Metaphors do not

nominate a specific thing to which they directly correspond, but rather initiate what Radman calls a “play of possibilities” (1997, 165). Further, a footprint, carbon or otherwise, whether taken literally or metaphorically has never really been simply about a measure of an area. Contexts of footprints matter. When for example, a living being leaves an impression through a footprint, to be sensed in myriad ways by another living being, that impression can take on a host of meanings, depending on so many variables: predator-prey relations, temporal relations between the making and finding of the footprint (think of dinosaur tracks found today by humans), and the surfaces, both geophysical and cultural, upon which the footprints make a mark to name just a few. That is not to charge these authors with the duty of understanding all of these contexts, but simply to point out that they will not be able to define in all contexts exactly what this powerful metaphor means as if it simply refers to a universal shoe size. This is one very important instance of the carbon footprint metaphor that gets taken up in international policy circles, but even here, the carbon footprint metaphor owes no singular allegiance to this interpretation. Rather, it exposes one of the sites of struggle in the politics of climate change by drawing attention to relations that may be called the concerns of carbon citizenship.

The second key feature of carbon citizenship, in addition to the role of affect, is an attention to carbon as an index of ecological materiality that must be more centrally considered in notions of citizenship. Carbon as an allotropic material and discursive element shapes citizenship in particular ways. As my textual contact zones in this chapter reveal, carbon footprint metaphors affectively mediate collective identity-building that shapes political action through notions of rights and responsibilities or obligations; these

collective identities, rights and responsibilities are elaborated in terms of *carbon* flows in a global biosphere. Here carbon indexes particular relationships of ecological materiality at a time of climate change. Following Heater (2004) who historicizes epochs of citizenship and those who recently have begun to think in environmental terms of citizenship (Smith 1998; Dobson 2003; Dean 2001; Dobson and Bell 2006; Latta 2007a; 2007b), it seems appropriate to assert the twenty-first century as an era of unfolding citizenships that more centrally and explicitly embed a polity within material ecologies. Given the recent and anticipated continuing rapid changes to material ecologies that are conventionally backgrounded in notions of citizenship (as land ownership, national boundaries, etc) to a foregrounded socio-political polity, these shifting ecologies now necessarily shape conceptions of citizen rights, duties, membership and boundaries in ways that are only now beginning to be theorized. Carbon citizenship picks up on Dobson's "ecological citizenship" as a theory that offers a potential corrective to asymmetrical global relations, as well as Alex Latta's version of plural ecological citizenships as struggles that unfold in specific contexts to generate contingent socio-ecological configurations.

Ecological-to-Carbon Citizenship

In theorizing the notion of ecological citizenship, Andrew Dobson's goal is to systematically relate ecological politics within a citizenship framework, on the grounds that "since its contemporary re-emergence, ecological politics has been habitually associated with citizenship-sounding issues such as the reinvigoration of the public sphere, the commitment to political participation, and the sense that individuals can make a political difference" (2003, 4). Dobson asserts his view of ecological citizenship as a

new form that cannot be defined through a conventional binary architecture of citizenship: the republican view of citizenship as *duty*, and the liberal expression of citizenship through *rights* (2003). Both of these expressions, he argues, generally imply a contractual and reciprocal relationship between the citizen and a polity, or organized political unit (traditionally, a nation-state). In contrast to this nation- scale and to the idea of reciprocity, Dobson's notion emphasizes a non-contractual, non-reciprocal obligation and responsibility through the concept of justice on a planetary scale. This move is necessary, he argues, because of the historical rise of global relations through an asymmetrical distribution of resources. Ecological citizenship, for Dobson, names a form of citizenship that requires understandings of limited resources and unequal global distribution and suggests moral obligation on the part of ecological debtors (the disproportionately 'developed') to creditors (the less-developed) (Dobson 2003). The relationship between citizens is thus highlighted rather than the relationship between a citizen and a "constituted political authority" (74-75).

To the two dominant forms of citizenship already expressed in the literature on the topic (liberal and republican), Dobson highlights a third – cosmopolitan citizenship – found in the work of Andrew Linklater (2002). This form of citizenship accounts for the transnational character of politics in contemporary life, and posits a citizenry of 'common humanity' operating in dialogic relationships toward consensual agreement. Instead of seeing globalization through these idealistic cosmopolitan conceptions of 'interdependence' and 'interconnectedness' and transcendent principles of equality however, Dobson argues "...globalization is best regarded as a producer of this political space of asymmetrical obligation" (2003, 30). For Dobson, the notion of interdependence

glosses over the very material production of injustice that instantiates global relations in the first place. The fact that cosmopolitan citizenship rests on the notion of ‘common humanity’, argues Dobson, erases the inequitable distribution of ecological space. Beyond this third form of citizenship, then Dobson describes a *post*-cosmopolitan citizenship that attends to this resource asymmetry, and establishes the basis for elaborating ecological citizenship.

The principle characteristics of post-cosmopolitan citizenship are the non-reciprocal nature of the obligations associated with it, the non-territorial yet material nature of its sense of political space, its recognition that this political space should include the private as well as the public realm... (2003, 82)

One of the most pressing themes of a post-cosmopolitan ecological citizenship for Dobson is the acknowledgement that material-ecological relations exceed the territoriality of nation states and thus, membership and its relational politics cannot be thought of strictly in statist terms. Another line blurred by Dobson’s version of ecological citizenship is the distinction between the public and private realm. Dobson “takes seriously the central feminist point regarding the need to politicize the private sphere – to recognize, in other words that the private sphere is a site of the exercise of power” (2004, 53). Conventional theories of citizenship centre on masculinist notions of virtuous male actors in the public sphere with the feminine spaces of the private sphere rendered invisible; however, feminist perspectives have troubled the dichotomy that prevents the private from being seen as a site of politics (Prokhovnik1998). In outlining the promises of carbon citizenship, I will draw out how this inclusion of both the public and the private in the terms of carbon citizenship renders visible certain key features of this citizenship further below.

In transposing *carbon* as a sub-element of ‘ecological’ citizenship as described above, Dobson’s themes appear generative. Global carbon relations emphatically imply non-reciprocal obligations, a political space that is material but not territorially-bound and one that is both public and private, as I elaborate below. The carbon footprint metaphor affectively mediates these relations in the Hertwich and Peters report. Significantly, the *ecological* footprint metaphor/metric signals the set of relations and political spaces at stake in Dobson’s elaboration of ecological citizenship:

Ecological citizenship’s version of the community of historical, or always-already obligation is best expressed via the earthly notion of the ‘*ecological footprint*’. This, in considerable contrast to the nation-state, the international community, the globe, the world, or the metaphorical table around which cosmopolitan’s ideal speakers are sat, is ecological citizenship’s version of political space. (2003, 99)

Dobson highlights the *ecological footprint* as an expression of the impact through daily living of certain individuals, and groups of “strangers near and far” (ibid., 119) since the political space evoked in ecological politics must be thought of as necessarily transnational. These strangers are the creditors to whom the ecological citizen is indebted. For Dobson, the awareness of these asymmetrical material relations through the space of the ecological footprint offers an opportunity for ecological citizens to shift from political action motivated by self-interest to action motivated by notions of justice toward their fellow citizens. Dobson’s citizenship appeal is profoundly affective in that it aims to foster orientational shifts among citizens with disproportionately large footprints in order to connect them to distant fellow citizens with small ecological footprints to whom they are obliged.

No doubt influenced by their work with Mathis Wakernagel, co-founder of ecological footprint analysis, the developers of the “Carbon Footprint of Nations”

analysis mobilize the *carbon* footprint metaphor to bring into visibility the political-ecological set of relations at stake in their analysis. Although they do not explicitly suggest the carbon footprint as the political space of (carbon) citizenship, the implications are commensurate with Dobson's take on the ecological footprint as a citizenship-oriented device. This metaphoric association with the footprint disturbs the conventional architecture of citizenship; such disturbance is, in fact, its strength in terms of the politics it makes visible as I describe below. Further, Dobson reflectively acknowledges the imprecision that plagues the notion of footprints as quantitative metrics, but nonetheless implicitly gestures towards its metaphoric capacity to reveal how many citizens and regions "borrow ecological space" from those in distant regions (2003,101). "It will be immediately apparent that difficulties of measurement dog the idea of the ecological footprint but without, in my opinion, undermining the basic idea it conveys" (Dobson 2003,100). Dobson implicitly returns the metaphoricity to the ecological footprint and even gestures at the wider metaphoricity of ecological citizenship as an idea (even as much of his work offers a problematic normative account of citizenship) (Latta 2007b; Latta and Garside 2005). Similarly, the carbon footprint in this instance as a site of carbon citizenship effectively disturbs norms of citizenship in complex ways.¹¹⁸ It does so by simultaneously considering multiple scales and political-ecological spaces that are interwoven in cultural politics of climate change. Re-thinking (implicitly metaphORIZING) political space allows new actors and processes to be admitted to the realm of politics (Magnusson 1996; Magnusson & Shaw, 2003; Magnusson, 2011). Why might footprints as metaphors *not* be considered a theoretical political space appropriate to ecological matters? They routinely transgress boundaries, and offer no promise of reifying

somewhat fixed anthropocentric structures of governance. Footprint metaphors also potentially politicise (or recognize as already politicized) ecological spaces formerly excluded from conventions of citizenship. The idea of political space here also brings into visibility a *weighty* atmosphere laden with consequential political relations indexed through carbon footprint metaphors. Whereas the atmosphere has not been central to the space of the *polis* in conventional theories of citizenship, in a contemporary time of anthropogenic climate change, one cannot entertain citizenship-oriented notions of rights and responsibilities without thinking of the atmosphere as a key site through which rights and responsibilities play out.

The Promises of Carbon Citizenship

The Carbon Footprint of Nations report troubles the notion of political space with respect to citizenship by acknowledging the category of nations as one key space, but also by recognizing that footprints move in complex ways within and across transnational spaces. An implicit form of carbon citizenship here makes visible a web of national polities, embedded within a larger planetary polity by naming nation-states as comparative categories in a global whole. Here carbon footprint metaphors support carbon citizenship as an elaboration of at least three entangled scales: the national, transnational and the individuals within these scales. Nation states appear as members of a larger carbon polity, the globe itself as a biosphere of living relations and carbon flows. This global polity is conceived as a flow of trade-linked carbon footprints that in one sense properly *belong to* members, the very nation-states who demand and consume items and services that are often produced in other nations. A focus on consumer demand within nations in turn calls

to present the individual consumers as citizens whose lifestyles bear scrutiny in terms of relative footprints of fellow carbon citizens in other countries.

The overarching promise of the kind of carbon citizenship that is implied within this carbon footprint contact zone maps onto the promise of Dobson's ecological citizenship by drawing into visibility global asymmetries vis-à-vis carbon emissions and certain forms of consumer-oriented development. As the graphic data in the table lay bare, "the average per capita footprint varies from just over 1 t per person per year (py) for several African countries and Bangladesh to 28t/py for the United States and 33 t/py for Luxemburg" (Hertwich and Peters 2009, 6415). Beginning with such asymmetries and drawing on notions of citizenship which theoretically suggest equality, reveals a 'not-yetness' in this emerging carbon citizenship. While these people are pulled together as somewhat united citizens in planetary carbon flows, the divergent size of footprints maintains a distance that is irreconcilable within the aspirational terms of citizenship. Carbon citizenship thus starts in this contact zone as a problematizing gesture. In metaphorizing the political space of citizenship as it relates to carbon flows, the carbon footprint in this report affectively draws three additional phenomena into visibility as I develop in the following section: First the footprint metaphor permits *consumption* to appear and simultaneously troubles the private-public division in conventional notions of citizenship; second, and relatedly, in problematizing consumption categories in developed countries as those that generate a large 'carbon footprint,' this report explicitly challenges "normal" development patterns among global citizens of nations; and finally, in revealing how carbon footprints (read as emissions figures) "hop" from the consuming country of goods to the country in which they were manufactured (Petherick 2012), the

metaphor challenges current dominant global climate change governance schemes that mask responsibility of developed importing nations.

Troubling Private/Public Binary in Citizenship Through Patterns of Consumption

For Dobson's theory of ecological citizenship and for the authors of the "Carbon

Footprint of Nations" and its website, one of the strengths of the footprint metaphor is

that it makes admissible as a citizenship concern that which is considered 'private' and

conventionally outside of the public sphere of citizenship. "In the Aristotelian tradition,

so influential in this regard, being a citizen involves political activity in the public realm.

Indeed, in this tradition politics itself is definitionally associated with the realm of the

Πόλις [polis] which is contrasted with the realm of the οἶκος, the household" (Dobson

and Bell 2006, 7). As feminist epistemologies make clear, this stark distinction between

the personal and the political has always been a false binary that consequentially removes

key political questions like sexual divisions of labour from the purview of citizenship

(Prokhovnik 1998). The ways in which ecological considerations trouble these

boundaries is also particularly poignant; in a sense one could say that there is no private-

public distinction in ecological citizenship, that these matters are material-ecological all

the way down. In the comfortable developed world, for example, energy-intensive homes

are not closed loops of energy and resources; rather, they belong to larger energy regimes

whose sources and effects are regional and global. Indeed in their elaboration of

ecological citizenship, Andrew Dobson and Derek Bell insist that decisions "as to how

we heat or cool our homes, or how and what we choose to buy to consume in them, are

decisions that have public consequences in terms of the environmental impact (which

may be far afield indeed) they entail. Ecological citizenship thus "invites us to take a

fresh look at a crucial piece of the architecture of citizenship” (2006, 7). Everything that carbon citizens do in their everyday spaces can be connected to a carbon calculus. While the previous chapter cautions that the spaces of climate change politics cannot be tidily reduced to the spaces of individuals in their homes, neither can the private spaces of domestic consumption be entirely effaced in politics by insisting on the “public” sphere as the solitary site of citizenship. I am not attempting to carve out a separate private sphere of carbon citizenship, but rather to insist that private and public intermingle in terms of ecological politics. The carbon footprint metaphor in this report affectively mediates the yoking of private and public matters as integral to these citizenship-oriented politics.

By insisting on the importance of consumption, Hertwich and Peters make clear in their Carbon Footprint of Nations report that “household environment impacts” should be brought into visibility in global climate governance even as their analysis offers a comparison between national carbon footprints across the globe. The graphic data in the “Carbon Footprint of Nations” report significantly yokes the carbon footprint (as emissions) with consumption patterns. As far as emissions are concerned, “on the global level, 72% are related to household consumption, 10% to government consumption...and 18% to investments... (Hertwich and Peters 2009, 6417). If 72% of emissions are somehow connected to households, then clearly it would be a categorical mistake to ignore the private sphere in concerns of carbon citizenship. The carbon footprint yokes consumption to relative national wealth according to *per capita* expenditures on specific consumption categories. These categories are: construction, shelter, food, clothing, manufactured products, mobility, service and trade. The analysis indicates that while the

bulk of the meagre 'carbon footprint' (read as emissions) for most developing countries comes from the consumption category of food, the greatest contributors to emissions in developed countries are the categories of manufactured products and mobility (influenced largely by emissions embedded in the manufacture and use of private vehicles) (Hertwich and Peters, 6417).

There may be reason for contingently preserving the two theoretical categories, private and public, regardless of seepage between them, if only to bring into visibility the mechanisms through which carbon footprint metaphors present one or the other category as the dominant arena through which to think and act upon climate change. Part of the purpose of Chapter Three, for example, is to reveal how carbon footprint metaphors in certain contact zones domesticate carbon subjects into acting primarily on an atomic private household level in a way that leaves carbon intensive systems and politics intact. Understanding the limits of carbon subjectivity, then, requires re-infusing the importance of a more public sphere, the conventional purview of citizenship. Meanwhile, understanding the limits of carbon citizenship in this chapter requires tempering a conventional over-emphasis on the public sphere with a sense of the importance of the private sphere.

My goal here is not to burden carbon footprint metaphors with the task of accounting equally for both private and public concerns in a universalizing way in all instances, but rather to suggest that particular carbon footprint metaphors bring into visibility particular contexts that demonstrate how publics and privates are necessarily fused in specific carbon relations. As the authors of the carbonfootprintofnations.com suggest, it is difficult to think of a way to address climate change at a public, national, or

international governance level, without also addressing consumptive lifestyles of private citizens, in both developed and developing countries.¹¹⁹

Problematizing “Normal Development”

Related to issues of consumption, the carbon footprint metaphor in this report draws into visibility the problematic ways in which footprints move not only in space, but also over time, as a function of “normal development” in nations:

Our main motivation for this paper was to better understand the role of *consumption* in causing climate change. We wanted to understand the importance of different consumption categories across different nations. We were surprised to see a nice pattern with a clear relationship between total consumer expenditure and the carbon footprint in different categories. There is no flattening out, no indication that the carbon footprint stabilizes at some point. This is, I’m afraid, bad news. We cannot expect that emissions are reduced as a part of normal development.¹²⁰

The ways in which consumption and ‘normal development’ are drawn together in the space of the carbon footprint suggests that current manifestation of economic development over time inevitably leads to larger “footprints.” The authors make it clear that what normatively constitutes development, at least in the latter part of the 20th century and thus far in the 21st century has been a sense of entitlement to consumer goods and services that (at least currently) depend on intensive emissions from the combustion of fossil fuels. Far from the notion of development being linked to necessary consumption categories, like food, and additional basic rights to services such as education, a particularly dominant version of contemporary development is defined rather by lifestyle enhancements that are centrally related to the manufacture of consumer goods and private vehicles. This development orientation towards manufactured goods is also fueled by the very processes of planned obsolescence that inevitably contribute to increasing national and global emissions.

To bring development into visibility through this frame of the carbon footprint metaphor is not to outright dismiss the trite question “why should *they* (*they* read as ‘developing countries’) not have what *we* (read as developed countries) have?” but to ask why the moniker *developed* has come to mean what ‘we’ feel ‘we’ have earned or are entitled to in the Global North. Developing might also, for example, gesture at a need to culture sensibilities (specifically within the largely-responsible Global North, as well as more widely) about how current global relations of privilege require appropriation from distant lands and/or future generations. Indeed, Dobson advances ecological citizenship as a remedy to the lack of such sensibilities in so-called developed countries; highlighting this deficit in the Global North productively challenges the notion of “developed” as a complete and perfect act on a progressive economic scale. Challenging these normalized patterns of (economic) development as they implicate increasing carbon footprints is what is at stake in the Carbon Footprint of Nations analysis. The carbon footprint metaphor here in this report and through the on-going ‘carbon footprint of nations’ analyses, challenge consumption and wealth as these categories have related to the ‘normal’ successful development of nations. “There is a strong dependence of CO₂ emissions with wealth. With a doubling of per capita expenditure, the CO₂ emissions from fossil fuel burning and industrial processes increase by 81%”(carbonfootprintofnations).¹²¹

The correlation between consumption and a quantitatively higher ‘carbon footprint’ problematizes the notion of wealth and its related normative metrics such as Gross Domestic Product (GDP). As Joseph Stiglitz suggests, “[t]he fact that GDP may be a poor measure of well-being, or even of market activity, has, of course, long been

recognized,” but nonetheless there is an on-going “GDP fetishism” that fails to take into account heightened social and ecological changes that affect development (Stiglitz 2009, 1). “Any good measure of how well we are doing must also take account of sustainability. Just as a firm needs to measure the depreciation of its capital, so, too, our national accounts need to reflect the depletion of natural resources and the degradation of our environment” (ibid., 2). Even as GDP has been somewhat displaced by notions like the World Bank’s Human Development Index (HDI), such indices are still “largely biased by the GDP” (Széll 2011, 548). And while radical alternatives like Bhutan’s Buddhist-influenced “Gross National Happiness” are gaining some attention, many other alternatives to the GDP such as the “PPP (Purchasing Power per Person) are still monetarily based indices whose ratings are bolstered by personal consumption (ibid., 547-48).

By attaching these perceived metrics of “success” to intensities of carbon emissions as a failure on the part of a global carbon citizenry, a different perception is enabled. The responsibility for failure of the global citizenry here however is crucially not distributed evenly across the globe. The numbers yoked to the carbon footprint tell a story of disproportionate responsibility between nations, whose footprints range from 1.1 tons of CO₂ equivalent per year in Mozambique and Bangladesh, to roughly 30tons per year, for example, in Luxembourg and the United States (Hertwich and Peters 2009, 6416). Rather than the badge of honour and feelings of pride conventionally associated with national trade and expenditures as a function of a robust and healthy economy, this report suggests rather shamefully weighty economies amongst some nations. For the authors of this report and the wider body of contributors to the website

carbonfootprintofnations, the carbon footprint analysis as a life cycle calculus points directly to what is at stake in current lifestyles in the Global North, where people have been able to consume as usual and attribute emissions for consumed items to the countries in which these products are manufactured. “The Carbon Footprint concept focuses attention on consumption and hence provides insights into the environmental repercussions of the lifestyles of the countries in question.”¹²²

Tracing “Hopping” Footprints

A final affective mediation enabled by this contact zone troubles a reading of carbon footprints as belonging in the space of the producer nation rather than the consumer nation of goods and services. Acknowledging that footprints move in political space permits understanding how they might “hop” with consequential resonances in global governance schemes that make crucial calculative choices in how they inventory footprints as emissions. Recognizing a common pitfall in appropriate attribution of emissions, Hertwich and Peters suggest:

The conventional inventory focuses attention on production and hence on the performance of industry. Both factors are relevant and should be taken into account. However, we want to avoid policies that shift emissions to other countries and account [sic] this as a success for the climate. To ensure that policies really reduce emissions of greenhouse gases, their effect on the carbon footprint needs to be calculated.¹²³

What this report brings into visibility through the carbon footprint metaphor is the notion of fairness in climate policy and governance issues related to established carbon accounting practices. The carbon footprint metaphor here as a form of quantitative analysis is charged with taking into account trade-based emissions that have notoriously been displaced from the origin of demand to the supply or manufacturing side of the

equation. Carbon accounting, like other forms of accounting, offers rubrics through which to displace items (and thus, responsibility) making them appear in unexpected spaces on a balance sheet, but this trade-linked carbon footprint analysis differs from the United Nations Framework Convention on Climate Change (UNFCCC) emissions inventories in two ways. Firstly it places the responsibility for the production of items within the footprint of the consuming country, rather than the producing country and secondly, this carbon footprint analysis also includes transportation of consumed items (ibid.). The authors, by insisting on the footprint as *belonging to* a nation, imply at least theoretically, that this metaphor entails a sense of duty related to a disproportionately large footprint brought about through consumption, even as they recognize paradoxically, that “footprints” as emissions do not ever belong singularly to a nation as emissions inevitably travel. For Hertwich and Peters, the notion of a national body politic with a footprint names this relation of responsibility much more robustly than do UNFCCC emissions data which allow the displacement of responsibility for emissions through nebulous trading relationships. Hertwich and Peters’ most complete carbon footprint analysis was conducted in the United Kingdom and “shows that emissions embodied in imports have increased faster than emissions embodied in exports. The CF of the UK has increased substantially from 1990 to 2004, while the UK government prides itself from being on target achieving the emissions reductions committed under the Kyoto Protocol.”¹²⁴ These authors performed similar analyses in Norway. More generally, “[t]he rise in emissions embodied in imports of OECD countries is matched by a rise in emissions embodied in exports for China,” but such important trade-related emissions leakages are not accounted for in the UNFCCC (ibid.).

Picking up on this issue with carbon accounting in her article evocatively entitled “When Carbon Footprints Hop,” Anne Petherick highlights the flawed convention of calculating emissions based on where the fossil fuels were burned, rather than where the products were sourced (2012). While some of the transnational flows of carbon are properly accounted for within international climate change convention negotiations, “the convention falls down when combustion occurs in the manufacture of a product before it is internationally traded” (Petherick 2012, 484). What is more “almost a quarter (23%) of the world’s carbon dioxide output comes from goods and services that follow such a supply chain path” (ibid.). Like Hertwich and Peters, Petherick points out that the embedded emissions in China’s exports far exceed the emissions embedded within their imports, so the reductive blame from the West aimed at China for its exponentially increasing emissions fails to reflect the fact that the demand for producing the emissions comes in large part from the West.

Similarly highlighting the movement of footprints, in “Kyoto and the Carbon Footprint of Nations,” Rachel Aichele and Gabriel Felbermayr point out that while many signatories to the Kyoto Protocol have reduced their domestic emissions since signing on, such reductions only appear through a trick of accounting that displaces these emissions (2011). Domestic imports have risen in these countries as domestic emissions have lowered; therefore, countries are meeting their targets in part through this loophole that allows them to foist the embedded emissions from imports demanded and consumed in their countries onto the countries in which consumables were manufactured. These reports demonstrate that in a global calculus, the one that ultimately matters the most in the warming of the planet, carbon footprints (read here as GHG emissions) have actually

increased. The carbon footprint metaphor (rather than simply carbon or GHG emissions) is mobilized in each of these accounts, highlighting that the movement of the metaphor of the footprint – its ability to ‘hop’ – generatively troubles the ways in which carbon flows are currently conceived in global climate governance. While such attempts at climate governance within the Kyoto Protocol have notoriously failed to generate a global consensus on equitable member-nation emissions targets, what the carbon footprint metaphor in this case and others like it demonstrates are some fundamental problems with the ways in which state’s emissions are currently calculated through the United Nations framework; indeed Petherick notes that a novel understanding of how these carbon footprints “hop” is currently leading to proposed new practices within the Intergovernmental Panel on Climate Change (*ibid.*, 485).

While I do not wish to imply that getting the numbers exactly “right” should be the goal of carbon footprint metaphors in this report or others, the quest to quantitatively and qualitatively make visible certain flows of carbon that have “leaked” in favour of the usual global beneficiaries provides an important corrective gesture to existing measurements. As I insist throughout this dissertation, making the carbon footprint metaphor function singularly as a quantitative metric disregards the power of metaphor. The authors of the “Carbon Footprint of Nations” report display a slight awareness of the impossibility of getting all the numbers exactly right by acknowledging the limits of their global model in providing exact “data quality” and a sharp “resolution” of results (Hertwich and Peters 2009, 6415). Although lacking a more profound awareness of the metaphoricity of the carbon footprint, this report gestures toward promising forms of carbon citizenship. Harkening to Dobson’s version of ecological citizenship, the

hopping of carbon footprints here reminds us that attempts to govern climate change might first begin by recognizing the asymmetries involved in the generation (and vulnerabilities) that constitute the problem.

Notably, although the report is entitled “The Carbon Footprint of *Nations*,” the carbon footprint metaphor enables an analysis of at least three entangled scales: the national, transnational and the individuals within these scales. Nation states appear as members of a larger transnational body, the globe itself as a biosphere of living relations. This planetary body is conceived as a flow of trade-linked carbon footprints that in one sense properly *belong to* members, the very nation-states who demand and consume items and services that are often produced in other nations. A focus on consumer demand within nations in turn calls to presence the individual consumers as citizens whose lifestyles in the “private” sphere bear scrutiny in terms of relative footprints of fellow carbon citizens in other countries. Attributing responsibility to these nations as the originators of the demand for carbon-intensive processes is thereby a key move, one which may reify the nation-state as one key site of politics. Paradoxically, however, connecting these responsibilities to certain nations requires understanding that carbon flows do not operate within the logic of human-centric political boundaries, that impacts originating from the demands of consuming nations are liberally shared beyond these borders. Carbon citizenship involves these paradoxes of individual, national and transnational entanglements. Such is the promise of the carbon footprint (of nations) metaphor here as it allows the globe, nations and individuals to appear in different aggregates and thereby presents a possible range of interventions across scales, particularly transnational scales, as I describe below. Crucially however, to present this

instance as the defining way in which carbon footprints should be read poses limitations for participatory politics. The authorities who are analysing in this case are engineers, and energy economists – authorities whose work speaks in part through flattening nations’ footprints into numbers and obscuring specificities within nations or regions.

Nonetheless, the evidentiary numbers and the metaphor speak in the contexts of global governance where the United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP) continues to meet annually. This report serves to demonstrate crucial weaknesses in emissions inventories such that future attempts must necessarily include debate on how these inventories are calculated and how subjective stories on ‘fairness’ come with no specific pre-defined quantitative metric or mechanism, but need to be worked through disagreements. Within these contexts, the ongoing Carbon Footprint of Nations analysis continues to shape a story of climate (in)justice and bring notions of *normal* development – especially in already-developed countries – into question, as I describe above. The sensibilities engendered through this kind of analysis would suggest that ‘we’ in the global North can only leave things the way they are if we consign those countries with low carbon footprints to continue to bear the brunt for our patterns of development while insisting that they stay where they are in terms of development. How might affectively drawing together a global citizenry in “fellow feeling” create alternative political orientations that address these asymmetries? As Mick Smith insists, Dobson’s form of ecological citizenship does not remain in a moral/ethical register of “compassion and charity” towards others because such a register “lacks a specific mechanism for addressing environmental harms: “Being obliged to do justice, to act in a way because it is binding rather than bonding, is for Dobson a political rather

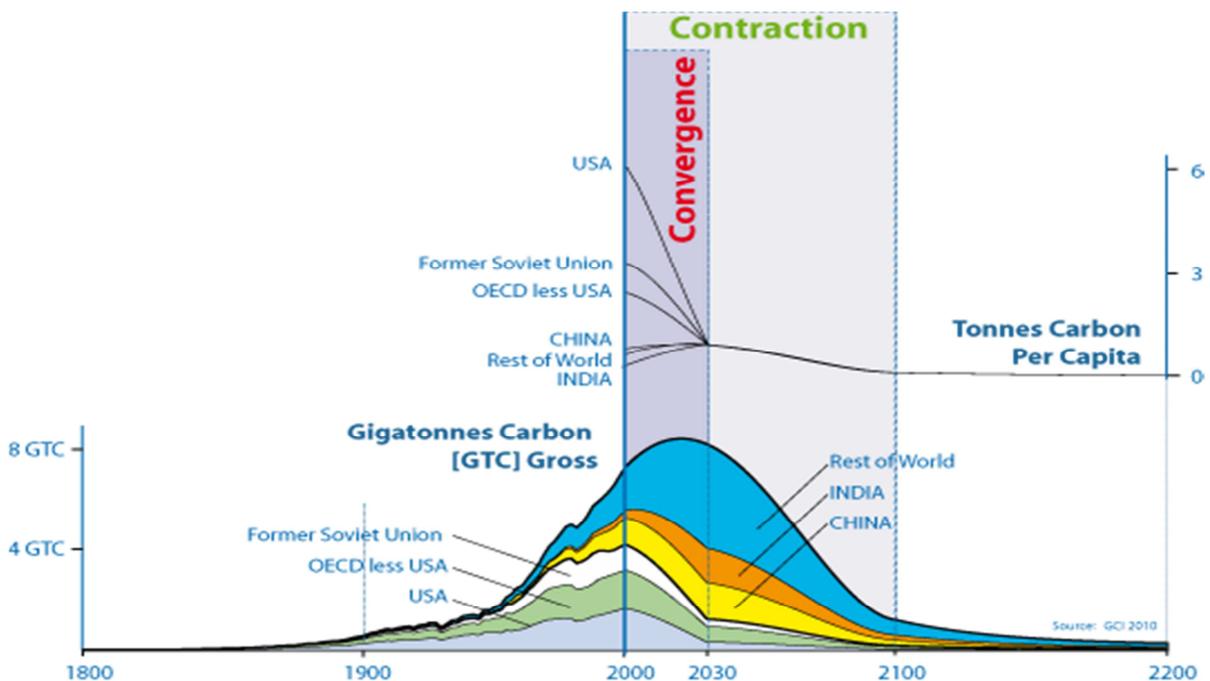
than a moral obligation. Justice is portrayed as a *binding* relationship between equals rather than the one-way revocable result of humanitarian obligations” (Smith 2005, 11). Significantly, Andrew Dobson’s ecological citizenship and the carbon footprint metaphor again intersect in a particular set of proposed mechanisms that configure fellow feeling in a way that manifests this politically binding affective relation.

Configuring Fellow Feeling: Contracting and Converging Footprints

To sustain this 450 ppm greenhouse gas concentration it is proposed that all people on the planet should be allocated *an equal carbon footprint*. Currently that allocation would be about 2 tonnes per person. By 2050 that allocation would fall to about 1.5 tonnes per person due to the anticipated population increase. World carbon emissions are currently in excess of 4 tonnes per person. So, our emissions need to contract to 2 tonnes and then 1.5 tonnes by 2050, if the cap is to be met.¹²⁵

In the above proposal for an *equal carbon footprint* on a public website based in Canada, the metaphor yokes concerns of carbon citizenship with Aubrey Meyer’s proposed ‘contraction and convergence’ scheme in terms of an equitable distribution of rights to emit greenhouse gases (see figure below). This contact zone gives further support to the mobilization of fellow feeling in cultural politics of climate change through appealing to Meyer’s scheme whereby certain underdeveloped populations would be allowed to expand their carbon emissions for a time while others, who disproportionately pollute, must contract their carbon emissions until a future time when all converge at an equitable juncture (Meyer 2001). The quotation appears on the website Climate Change Connection, a site emerging out of Canadian responses to the Kyoto Protocol and a new national carbon consciousness.¹²⁶ Though the presence of a carbon footprint metaphor in a Canadian provincially-funded site might beg the question of relevance, its manifestation here is again suggestive of an everyday appeal to citizens whereby policy-type language

like “emissions” becomes translated into the register of the carbon footprint for a public becoming carbon conscious and being shaped into communities of citizens through these affective contact zones. The carbon footprint here becomes the link between global or national “emissions” as a conglomerate and an individual citizen whose footprint comes to count within this calculus. The explicit mission of this organization is public outreach and education and it continues to deliver globally-relevant climate change news on a daily or weekly basis for publics beyond Manitoba and Canada, due to its on-line presence.¹²⁷



This example shows regionally negotiated rates of C&C.
It is for a 450ppmv Contraction Budget, with Convergence by 2030.

Figure 3: Visual Representation of Meyer's Contraction and Convergence Scheme

Although Meyer's contraction and convergence schema is widely known to those interested in climate change politics, especially at the international policy level, an average citizen who comes to this site might not be familiar with it. The carbon footprint metaphor attaches a mode of popular sensibility to numbers that appear, but may not

strongly compel a form of affective association with equitable carbon citizenship for individual citizens. The quotation above highlights the connection between 450 parts per million of carbon dioxide equivalents in the atmosphere (what in some climate change models is the maximum allowable) and a suggested appropriate amount of emissions per capita – first 2 tonnes then 1.5 tonnes by 2050 - for a global carbon citizenry with a carbon budget. The exact numbers – parts per million and per capita allowance, though highly relevant in the negotiations of international climate change governance, are not as relevant to the public because they may not make sense on their own as numerical abstractions for carbon citizens. In fact, Aubrey Meyer himself notes that these numbers need to be negotiated by global players, but that the first move is a largely qualitative one that sets up a kind of equitable carbon citizenship as an aspirational goal (2001). Much of the literature on Contraction and Convergence uses the terms of the “global citizen” as a figure both deserving of equal rights to emit carbon and subject to equal responsibilities around carbon’s atmospheric dispersal. Contraction and Convergence schemes, suggest “every global citizen is allocated an equal entitlement to the atmosphere” (Roberts and Parks 2013, 177).

“Contraction” and “convergence” themselves are evocative metaphors that suggest an ultimate coming together of global carbon citizens; indeed elaborator of ecological citizenship Andrew Dobson himself, proposes this model as a starting point for international climate negotiations after the failure of Copenhagen (Dobson 2014, 17-18). In beginning with divergent footprints that must converge at some point, this scheme attends to the “not-yet-ness” of this affective form of carbon citizenship in which bodies must be drawn into more proximal equivalencies. Notably, Meyer presents another

ecologically-meaningful metaphor, the “global commons,” upon which the principles of contraction and convergence are founded: “The atmosphere is a global commons and everybody has an equal right to emit greenhouse gases into it. If you don’t stand for that, you have to defend inequality” (Meyer 2011, 1). The carbon footprint metaphor helps to render this relationship visible for visitors to the Climate Change connection website. Significantly on the website, this carbon footprint leads to a graphic portrayal from the award-winning climate change film, *The Age of Stupid* (Armstrong 2009) demonstrating how contraction and convergence would work.¹²⁸ The graphics show a disproportionately large figure of a person representing the large quantities of present-day emissions in the United States, followed by a slightly smaller figure representing emissions of Europe, followed by figures of China, India, and Africa, whose greenhouse gas emissions are represented by respectively smaller figures. Each figure walks on a timeline and as they walk into the future, the figures of the United States, Europe and China shrink, while those of India and Africa grow for a time until about 2025 when “each human being on the planet would have equal rights to the Earth’s resources.”¹²⁹ Continuing their walk on the timeline, all of the figures finally equilibrate as tiny figures with little-to-no carbon emissions by about the year 2065. The association with the footprint is made by the figures walking; their movement over time is indicative of the shrinking carbon emissions of some countries and the growth of some others with the eventual tapering off and equalization of the carbon footprints of all global citizens as the quote suggests. This image, like the Carbon Footprint of Nations report troubles the notion of normal development and goes even beyond by suggesting a contraction of “normal” emissions-intensive development.

The above contact zones offer the promise for carbon footprint metaphors to mediate what Ahmed calls “affective forms of reorientation” (2004, 8-9) whereby consciousness of shared carbon flows presents possibilities of felt relationality and human connectedness that are politically manifested. Fellow feelings in these terms of carbon citizenship might imply a detaching from norms of the “we” that are configured in the present through similar patterns of (over)consumption toward explicit affective re-attachment with a novel “we” with whom we are already implicitly affectively attached through carbon flows. Again to remind us in Carey Wolfe’s paradoxical terms of climate change, “there is no we and yet there is nothing but we.” Understanding this paradox as it appears in the Hertwich and Peters report and Meyer’s contraction and convergence scheme gestures toward an emerging carbon citizenship that seeks to address global inequalities that are exacerbated by climate change. I call this an emerging carbon citizenship because to those reading citizenship in conventional terms of institutionalized legal status, this form of citizenship might appear at the moment to be little more than a moral plea. After all, the world is still currently organized as a system of states and citizenship in its legal sense is still state-bound. Lest this emerging form of citizenship be dismissed as citizenship on these grounds, however, I insist with Wolf et al (as well as all those who are working on ecological citizenships) that citizenship is also “a moral category and a social (as well as political) identity” (2009, 504). Further, this form of citizenship, though not yet instituted in a legal sense, appears to be informing an institutional horizon in climate change governance, as the endorsements for contraction and convergence below suggest. In terms of human history, an awareness of climate change by the public is a fairly recent phenomenon. As I describe in Chapter One, the

institutional bodies developing to address climate change are also novel in human history. Thinking in terms of a global political community of citizens who share an atmospheric commons represents a paradigmatic shift in how we might think of citizenship within and against our current state-centric political institutions and perhaps the ‘failures’ of global climate change governance thus far reveal this struggle is not an easy one. Yet this struggle is visibly emerging; a moral and political community of theoretically equal citizens may be thought of as a precursor to a legally institutionalized citizenship-to-come.

Notably, the contraction and convergence model (C&C) presents some obstacles that must be addressed in the politics of carbon citizenship; but these obstacles have not prevented its consideration and its future promise. Foremost among the obstacles may be the lack of engagement with C&C in many emissions-heavy countries. While the Africa Group of Nations has been advancing this model for many years in international climate negotiations (Meyer and Weir 2006), others have been slower in considering it. The fact that C&C does not have unequivocal global support should not be surprising given recent history of wealth being connected to carbon emissions, as is evidenced by the Carbon Footprint of Nations report. As Madeleine Heyward suggests, “Contraction and convergence probably has limited feasibility in the face of significant opposition by some major emitters,” and yet she also notes “it is flexible and has considerable support in other quarters; thus some elements may figure in future action” (2007, 526) Since its emergence, C&C has been gaining crucial support, even from wealthy nations in Europe. The Royal Institute of British Architecture (RIBA) adopted this model in 2006 (Building Design 2006). Part of its appeal lies in C & C’s attention to both developed and

developing countries; developed nations have often adopted a ‘why should we change if other developing countries are exempt?’ stance in global climate negotiations, but “[a]n increasing number of countries recognise the logic of the Africa Group Proposals for Contraction & Convergence. It answers the U.S. demand for a global solution...”(Meyer and Weir 2006, 19). Cambridge University economist, Michael Grubb, suggests such per capita-based schemes as “the most politically prominent contender for any specific global formula for long-term allocations with increasing number of adherents in both developed and developing countries” (1999, 270). Although what I am describing as carbon citizenship here might appear for the moment to be the formation of ‘just’ a moral community with no political clout, these formations inform the high-stakes political arrangements that emerge in their wake. If one thinks of movements such as women’s struggles for suffrage and the emancipation of slaves, for example, a moral community of theoretically equal citizens emerged as a precursor to politically instituted and legally-binding arrangements. As Alex Latta suggests, ecological citizens in positions of privilege must be more attuned to the “role of subaltern political actors in politicising the injustices of existing socio-ecological orders” (2007, 378). After the failure of the Copenhagen accord, Dobson called attention to this tendency to ignore subaltern voices of African nations and small island nations in international climate negotiations, and insisted on C&C as the “best way” forward to address the concerns of both “developed and developing” nations:

Justice is the key objective, since without it there will never be a sufficiently wide agreement on emissions reduction. 'Contraction and convergence' is the best way to frame future agreements, since this is fair both on 'developed' and 'developing' countries. The sight of the world's most powerful countries putting a deal together at the last moment must not be repeated in future. (Dobson, 2010)

Although movement toward C&C may seem slow on the one hand, the gradual waves of support for this model reveal a shifting consciousness about forms of carbon citizenship and connectedness. “C&C is now the most widely cited and arguably the most widely and diversely supported model in the UN negotiations on climate change and the debates these have given rise to” and there have been numerous endorsements for C & C including from: the heads of state of the South Asian Association for Regional Cooperation (SAARC); German Chancellor Angela Merkel; former French President Sarkozy (Global Commons Institute, 2008). The IPCC has suggested "a formulation that takes the rights-based approach to its logical conclusion is that of contraction and convergence (IPCC 2001). In their plea for the consideration of contraction and convergence, Meyer and Weir mobilize another evocative political metaphor: “Averting human-caused climate change actually makes ending global apartheid necessary’ (2006, 19). The reference to apartheid, an Afrikaans word that means segregation, literally “apart – hood”¹³⁰ suggests what is at stake in this picture of carbon citizenship is a crucial redress that affectively re-composes a community through urgent ecological politics. Such a redress grants that global citizens are all equally deserving of rights and responsibilities (or “carbon footprints”) vis-à-vis carbon emissions, and consequently aims to enshrine these rights and responsibilities in emerging political agreements.

Ecological/Carbon Citizenship as Metaphorical struggle

Lest it appear that carbon citizenship entails a singularly promising course of action in the cultural politics of climate change, I now more explicitly turn to carbon citizenship as a metaphorical struggle that manifests in different ways. “The concept of ecological citizenship can be understood in a variety of different lights, not all of them compatible”

(Latta and Garside 2005, 4). As Alex Latta's case studies of ecological citizenship attest, contexts matter; these contexts animate how citizenship is articulated in crucial ways (2007a; 2007b). Rather than beginning with notions of ecological citizenship in the abstract and insisting on certain norms as does Dobson, Latta proceeds through a grounded account of a specific site of competing discursively-mediated constitutions of citizenry.

Latta's case study of contesting ecological citizenships involves a hydro-electric energy development project in the Alto Bio Bio river basin of Chile where the Ralco development project required the flooding of the habitat (3500 hectares) of a traditional Mapuche community (2007b). The struggle between the local community and Endesa Chile, the privatized power provider, took place between 1990 and 2003, culminating in the relocation of the Mapuche peoples and the flooding of the habitat. This event involved a protracted struggle over identity, ideology and interests in the post-Pinochet trauma of the country. Through a discursive analysis, Latta demonstrates how each competing articulation of citizenship was founded through different notions of citizen 'virtuosity.' In the case of the normative national discourse of citizenship, consumers within the post-Pinochet liberal regime of economic growth and energy consumption were posited as virtuous citizens through discourses on the natural hydro-electric resources available in the country that would help foster development and national self-sufficiency for Chile. On the other side of the battle, an "insurgent ecological citizenship" was constituted through the collective articulations of the Mapuche people and their refusal "to be normalized within the dominant regime" (Latta 2007b, 241). Although the battle in this particular location ultimately ended in the victory of the national

government, Latta notes that “insurgent ecological citizenships” are not gone, but continue to articulate in other Mapuche communities, thus he aims to recover the political possibility from plural ecological citizenships that remain to animate different future outcomes against a singular neo-liberal citizenship regime (ibid., 243). Latta demonstrates that ecological citizenship can provide the ground for understanding citizenship as a tool of a polity in the construction of cohesive membership and also as an analytic discursive framework for unpacking the ways in which multiple citizenships are constructed. For Latta, “citizenship should be understood not merely in terms of its existing (or theoretically proposed) formal basis, but also in terms of the struggles that seek to reshape it”(2007a, 389).

Latta’s insights animate an analysis of how different carbon citizenships are expressed through carbon footprint metaphors. Within various instances of carbon footprint metaphors, different communities and forms of “good” citizenship are implied. In the “Carbon Footprint of Nations” report, the political community is developed through interweaving scales of the nation-state, and the globe as a trade and carbon linked system. Virtuosity at the transnational level of carbon citizenship, which in turn implicates private citizens of nations, entails an obligatory politics of reducing consumption, especially within the sectors identified with the highest carbon footprint (such as manufacturing and mobility); such a reduction is accompanied by a limited time increase of emissions on the part of those whose ‘carbon footprint’ is lower since a theoretical and eventually-manifested equal entitlement to emissions is a goal for a global citizenry. This is, however, not the only version of citizenship expressed through carbon footprint metaphors as we shall see. As Latta suggests, one must pay close attention to

“the way that citizenship and the environment become intertwined in relations of power, where the notion of citizenship is far from innocent and battles over nature are simultaneously struggles over the shape of political community” (Latta 2007b, 230).

Through discursive analysis of the protracted struggle over Mapuche land in Chile, Latta elaborates two key notions that help to unpack differing expressions of ecological citizenship that also apply to emerging carbon citizenships as struggles. The first is “political natures” and the second is “citizenship regime.”

Political natures describe the mechanisms through which ‘nature’ gets taken up or is accounted for in political processes and conflicts within articulations of ecological citizenship:

I am interested in the way that the politics of citizenship becomes ecological through its articulation with numerous different (and not all “green”) understandings of the environment. As a way of flagging this articulation, I call these understandings “political natures.” (2007b, 231)

Importantly, Latta makes visible nature(s) here neither as a reified mute thing that can, as Latour suggests, shut down democratic processes (2004), nor as inert environment, but as a discursively and culturally mediated material relationship that varies within different citizenships. The same can be said of carbon itself and the carbon footprint metaphor which comes to take on various meanings and brings to light different associated practices of citizenship. The ways in which carbon is explicitly politicized in citizenship discourses featuring carbon footprints varies in different contact zones; thus, this metaphor’s affective mediations feature a contested dynamic of the shaping of political communities.

A second pivotal notion that Latta uses is “citizenship regime” (2007b, 236). This notion foregrounds a dominant power structure that ensures certain normative articulations of citizenship. In Latta’s case of the Chilean government’s neo-liberal citizenship regime, citizens were construed as marketized and economically developed energy-users for the benefit of the nation’s cohesion and growth. Latta provides an elaboration of the dominant citizenship regimes as an analytic tool to uncover the ways in which a range of citizens’ behaviors and actions are encoded within the norms and standards of a dominant polity and the ways in which these are challenged by “insurgent” ecological citizenships. In his case study, the national citizenship regime was largely determined by the Pinochet administration’s violent imposition of a neo-liberal agenda of economic development. This citizenship regime dictated that the ‘nature’ in question, the river basin and habitat of the Mapuche people, be politicized as a source of renewable energy for an economically developing nation. To oppose such a project implicated objectors as bad citizens, oppressors of the economic and social health of the emerging nation; therefore, virtuous citizenly behavior within the national regime would dictate support for such developments of natural resources. Latta presents the notion of a citizenship regime as a kind of top-down ideological mechanism, but he also suggests that the dynamic interplay between political natures and divergent articulations of citizenship reveal myriad ecological citizenships whose presence may enable a more democratic understanding of citizenship. Ecological citizenships reveal their substantive content through specific sites and discursively-mediated relationships that form the central ‘political natures’ of a given community. Therefore, what motivates and

constitutes the behaviors and actions of ecological citizens is contingent upon the values of each political community, expressed in discourses and actions.

Inflected in this way, the myriad articulations of carbon citizenship through carbon footprint metaphors provide a productive site of politics as contestation. Who or what counts? What does it mean to take the element of carbon as an important site of citizenships? How is 'nature' (in this case, carbon) politicized in various discourses and what does it bring into frames of visibility? In the first contact zone featuring carbon footprint metaphors above, carbon is politicized in a particular way that brings non-reciprocal global relations into view. In the textual contact zone that follows, the metaphor yokes carbon citizens to a problematic nation-oriented liberal environmental citizenship regime.

The Risks of Nation-Oriented Attachments of Carbon Citizenship: Tarring Over Footprints

Oil sands oil actually has a smaller carbon footprint than other sources of oil, like in Nigeria where huge amounts of natural gas are simply burned off into the air as the oil is produced.

- Ezra Levant, *Ethical Oil: The Case for Canada's Oil Sands* (6)

As those who work to push the boundaries of citizenship into ecological realms attest, notions of citizenship are subject to the over-determinations of nation-bound discourses and practices that often reify "current socio-cultural norms and structures" (Wolf et al 2009, 518). Even Andrew Dobson, a strong advocate for inculcating practices of ecological citizenship, recognizes the risks of liberal democratic state-centred environmental citizenships. In such states, a widely interpreted "sustainability" registers as one index of health and welfare of its people amongst other usually more heavily-weighted indicators of economic growth and employment such as the GDP (Dobson

2003, 150). Thus, there exist certain incompatible aspects in a general health and wealth framework of liberal democratic states, which also coincidentally happen to be those states that “are responsible for by far the most environmental damage” (ibid., 142). Nation-oriented citizenship attachments can serve to “repeat past associations” and this has to do with “signs and how they work on and in relation to bodies” (Ahmed 2004, 194). The carbon footprint metaphor is not innocent in this regard; in the following contact zone, this metaphor acts as a sticky sign that produces the surfaces of nation-bound carbon citizens in opposition to global others by making these others into objects of carbon pollution and hate.

Perhaps no other carbon footprint metaphor more clearly attaches to a fraught liberal citizenship regime than the one quoted above. From the book of well-known climate skeptic, Ezra Levant, this carbon footprint metaphor affectively mediates the shaping of a body of virtuous Canadian citizens with a smaller carbon footprint than an imagined body of citizens in Nigeria. While those responsible may not be citizens, but rather oil producers, the appeal resonates within an affective register of citizenship in Canada which draws people together in national community in part through distancing from other ‘foreign’ communities as Ahmed indicates. Here the carbon footprint (metaphor) is presented as a sticky sign of dirty carbon released by the burning of natural gas during the production of oil. One could question the quantitative metrics of the carbon footprint in this instance because Levant does not cite data or make reference to a report of these comparative measures; there is no life cycle analysis of carbon dioxide produced from cradle to grave in Alberta bitumen extraction versus Nigerian oil extraction processes. Notably, the more general data for *per capita* carbon emissions

suggests a gaping chasm between Canada's carbon emissions of approximately 16.3 tons per year, and Nigeria's which amount to approximately 0.5 tons per year (Energy Information Administration 2012).¹³¹ But to question such metrics may be beside the point, for the footprint here only peripherally gestures at anthropogenic climate change since Levant himself is a skeptic of anthropogenic causes of global warming. More important than the (absent) metrics here is the way in which "[t]he 'nation' becomes a shared 'object of feeling' through the 'orientation' that is taken towards it" (Ahmed 2004, 13).

As I explain in what follows, the carbon footprint metaphor in the context of this book carries along the nation-centric citizenship conditions to support Levant's "ethical oil" agenda, an emotionally-charged platform to foster the unbridled development of the bitumen sands for the economic benefit of Canadian industry and national wealth. Like the previous contact zone, this textual contact zone features the profoundly important work of affect in binding bodies together in carbon citizenship; however, in this instance the mechanisms for binding bodies together in the shaping of community particularly involves sticking hate and disgust onto global others in what Ahmed calls reactions of "awayness" (ibid., 8). The metaphor of the varying carbon footprints at the lead of the book initiates a seemingly quantitative comparison between two countries' oil production techniques which then gets yoked throughout the book to more generalized arguments about the relative virtuosity of Canada in the world; this claim of relative virtuosity is aimed at displacing the validity of critiques of oil production in Canada.

The first of Alex Latta's key notions mentioned above – political natures – helps to unpack how carbon citizenship is affectively articulated in this contact zone whereby

the carbon footprint metaphor initiates a narrative that carries over a host of other hateful impressions of others. Carbon as allotropic material and cultural element is politicised in a way that lends to its compounding attachments to other undesirable characteristics that have no immediate relation to climate change. Attaching a larger, dirtier carbon footprint to Nigerian oil extraction is the first step in pulling together a nation of liberal environmental Canadians who might otherwise be critical of the bitumen extraction process in Canada. What is first drawn into visibility in this contact zone of the carbon footprint metaphor used by Levant is the image of one point in a complex chain of oil production. The image of plumes of greenhouse gas emitting billowy flames emerging at the source of production of oil in Nigeria is next yoked together with supposed corrupt and violent attributes of global others who, in Ezra Levant's thesis, are the unethical version of Canadian oil sands extractors, a cleaner, more civilized and, above all, "ethical" species of citizens. As one can see in the elaboration of Levant's ethical oil agenda, carbon gets politicized not only as an index of dirty oil production; carbon is yoked to other entities/ relations as an index of a number of these other hateful attributes. By supporting our own fossil fuel industry the rhetorical "we" of Canadian citizenry are virtuously diverting and redistributing money:

...that could have helped further arm Nigeria's brutal militias, to fund Iran's hostile nuclear weapons program, to power Russia's materialistic warmongering, to prop up Venezuela's failing Marxist experiment and its suppression of citizens' rights, and to allow Saudi Arabia's princes to sponsor more terrorists and buy yet more time for their cruel and decadent regime. (2011, 228)

Here carbon citizenship becomes saturated with the affects of a geopolitics of emotion of us/them, whereby hatred or loathing is attributed to the national bodies of Venezuela, Nigeria, Saudi Arabia. The catalogue of Marxism, terrorism, primitivism, nuclear

armament, ('foreign') and misogyny rampant in other countries reads as a litany of all that is at odds with the ethically purified carbon footprint of our Canadian Western liberal democracy. Through this particular citizenship discourse, the nation as an object of attachment comes into effect through a process of sticking disgust and hatred to other bodies politic:

“...hate creates the surfaces of bodies through the way in which bodies are aligned with and against other bodies. How we feel about others is what aligns us with a collective, which paradoxically ‘takes shape’ only as an effect of such alignments. It is through how others impress upon us that the skin of the collective begins to take shape. (Ahmed 2004, 54)

In order to align the intra-national dissenting bodies on the issue of oil sands development, the body of a Canadian national collective is evoked. The liberal democratic nation takes shape to keep out the hateful influence of global others. Says Levant: "I don't know what God was thinking when he was handing out oil, but he gave it to all the world's bastards - Saudi Arabia, Iran, Venezuela and Nigeria. Out of the top 10 countries ranked by oil reserves, Canada is the only Western liberal democracy on the list" (Chase, 2012). “We” Canadians have a set of values that prohibits the kinds of malevolent practices that run rampant in these other geopolitically troubled regions. “We” do not stone our wives to death for adultery; “we” do not kill people over oil as they do in Nigeria; “we” do not harbour terrorists who blow up the most sacred secular institutions in the developed world as they do in Saudi Arabia and Iran (Levant 2011, 16-34). There is only one virtuous choice for oil extraction in the global reserves and selling this message to the Canadian citizenry is the first necessary step in the on-going mission of selling the crude to a global market hungry for oil, a global market that ironically, as Levant suggests, does not actually care whether the oil is ethical or not. It is as though

our smaller carbon footprint helps to shed light on the manifest destiny of the keepers of Western liberal democracy and bituminous wonders to bring ethical oil to the masses of unenlightened others. To do otherwise than to support *this* Canadian ethical oil development would be, for Levant and his supporters, simply un-becoming of citizens. Such is the work of the carbon footprint metaphor presented by Levant as it politicizes the ‘natural’ element of carbon by yoking it with elements of what he calls “conflict oil.” Conflict oil in Levant’s discourse is that which is mixed with misogyny, government corruption and generalized violence.

A certain “Canadian” form of carbon – bitumen – is also politicized by Levant in a way that naturalizes it as an indigenous element that has been part of the Canadian landscape and important First Nations cultural traditions. Paradoxically then, this tarry sticky substance that has been referred to as one of the most difficult substances to extract and to clean when spilled as ‘dilbit’ or diluted bitumen (Hasemyer 2013) gets culturally refined for an imagined Canadian citizenry. This imagined community begins problematically with the very first indigenous “Canadians,” as if the nation came into existence without the violence of a colonial past that is perpetuated in the present through large-scale extraction operations. “It’s true there is oil seeping into the rivers north of Fort McMurray and sometimes the air smells like sulphur and the water is bitter. And that’s how it’s been for millennia – Aboriginals traditionally used the thick bitumen that bubbled out of the ground to waterproof their canoes” (2011, 4). To downplay the alarmism that Levant claims plagues the environmentalists whose opposition to the bitumen sands development relies on smeary images of the land, Levant coolly paints an affective picture of the natural and harmonious relationship that bitumen has always

played in the region. Naturalizing the current extraction processes as continuous with a kind of romanticized indigenous symbiotic co-evolution on the land does tremendous affective work for the ethical oil appeal. How could this carbon footprint be anything but ethical, despite the unsubstantiated quantitative claim made through its appeal and the fact that its author does not believe in anthropogenic climate change? This naturalized bitumen footprint comes along with the affective stamp of Canadian virtuosity, stripped of its colonial past, present and future.

By examining Levant's use of the carbon footprint as a lead-in to the appeal to citizenry to support 'ethical oil,' I am, by no means, suggesting that Canada is "the worst" in a comparative analysis of these countries. Indeed the claims that Levant makes about some of the countries in question are 'true' to some degree; however, as many commentators have revealed, Canada is far from 'clean' from either an 'ethical' standpoint or an emissions-calculus standpoint (Kurek et al 2012; McLachlan 2014; Nikiforuk 2010, 2011; Pembina 2005). Both the eruptive violence of oil production and transport (most recently, for example with the 2013 Lac Megantic train explosion which killed 47 people), as well as the more gradual violence evident at the site of production whose effects are increasingly widely dispersed reveal a highly problematic set of practices within Canadian operations. To nuance my analysis here, Levant's argument is not unequivocally 'bad.' One unanticipated effect of Levant's argument is that it initiates a broader reflection on the ethical and political arrangements entrenched in current sites of oil production.

If one takes Levant's own urge to call attention to ethics, politics of oil and comparative emissions beyond his own argument, two important issues arise within a

Canadian context. The first is the fact that indigenous communities in Northern Alberta themselves are bearing a disproportionate burden of toxicity in relation to this bitumen extraction process, despite Levant's claim that indigenous communities and bitumen have always been and remain in 'natural' harmony. Whereas the kinds of violence evoked by Levant as present in other countries are spectacular forms that are immediately visible, there exist in Canada's oil production site many examples of what Rob Nixon calls "slow violence", a violence that "occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional form of violence that is typically not viewed as violence at all" (Nixon 2013, 2). This long-term and cumulative kind of violence is at once social and ecological, for creating toxic loads within the air and water surrounding the site of oil production also directly impacts the human communities, predominantly Indigenous, who subsist within these ecosystems; notably, these impacts are multi-generational. A scientific report commissioned by Environment Canada suggests, "[o]f particular concern are the atmospheric loadings and distributions of contaminants associated with oil sands surface-mining and processing activities, many of which are carcinogens and rank in the top 10 hazardous substances on the US Agency for Toxic Substances and Disease Registry (Kurek et al 2012, 1). These carcinogens, specifically the polycyclic aromatic hydrocarbons (PAHs), have been found to be 2.5 – 23 times greater than levels before the oil sands development in lakes as far as 90 kilometres away from the development site (ibid., 1). While this report does not go so far as to directly link increased rates of cancer among indigenous communities in Fort McKay and Fort Chipewyan, it does suggest against industry claims, that the scale and pace of expansion of the oil sands creates "extraordinary" and undeniable impacts to

these socio-ecological systems which require further study for their longitudinal impacts (Ibid, 4). Some such research has recently been undertaken through the University of Manitoba with the communities of the Mikisew Cree First Nation and the Athabasca Chipewyan First Nation that are downstream from the Oil Sands. Findings indicate “upstream development [of the oil sands] and environmental decline are affecting cancer occurrence. Thus, cancer occurrence increased significantly with participant employment in the Oil Sands and with the increased consumption of traditional foods and locally caught fish” (McLachlan 2014, 12). Such evidence of gradual and multi-generational slow violence tempers an easy rendering of Canada’s ‘ethical’ status.

The second issue obscured by Levant’s “ethical oil with-a-lower-carbon-footprint” narrative pertains to both the notoriously energy and water-intensive process that is involved in bitumen extraction and the unprecedented scale of development of these oil sands. Three to six barrels of water are extracted from the Athabasca River for each barrel of bitumen surface mined (Schindler and Donahue 2006). Summer flows in the Athabasca River have declined due to a combination of climate change and water extraction for the oil sands development and there is great concern that at the pace and scale of projected development, a lack of water security will severely threaten socio-ecological systems (ibid.). In addition to the intensive use of water, oil production at the oil sands site contributes a comparatively high proportion of emissions relative to other oil production sites, so the ‘carbon footprint’ analysis as a quantitative measure does not present Canadian production in a good light in general oil production. Even the Canadian Association of Petroleum Producer (CAPP), whose facts, if anything would be skewed to understate impacts suggests, “[o]il sands crude has similar CO₂ emissions to other heavy

oils and is 9% more intensive than the U.S. crude supply” (CAPP 2014).¹³² What is more, the scale of the operation of Canada’s tar sands exceeds that of Nigeria, the one claimed to have a higher carbon footprint (with no accompanying analysis). The known quantity of oil reserves in Canadian Oil Sands far exceeds that of Nigeria, so the calculus requires a longitudinal perspective that is clearly not part of Levant’s assessment (EIA 2014).

Levant’s argument requires a comparative analysis that flattens time and space and tars over a potentially political-ethical space of the carbon footprint. Nonetheless, it is still an appeal to a form of carbon citizenship that suggests while ‘we’ are taking carbon out of the grounds (as the idealized reader knows needs to happen since we still need it for almost everything in the developed world), ‘we’ ought to act virtuously by supporting the values that ‘we’ believe in as they manifest in Canadian Oil Sands production. A similar story affectively binds Canada and the United States along the lines of ‘repatriating’ North American energy and avoiding the political volatility still rampant in the Middle East and Africa (TransCanada 2011). The argument short-circuits many key questions including: what could be done, even through limited bitumen extraction, to enable a move away from fossil fuels; and whether the bitumen extraction operations in Canada themselves could be done more “ethically.” As Andrew Nikiforuk notes, oil and good ethics do not generally mix, although so-called “conflict oil” and so-called “ethical oil” regularly do because of the masses of light crude “conflict oil” imported as a necessary aspect of bitumen extraction process (Nikiforuk 2011). Levant’s argument is entirely constructed on a false set of oppositions and choices: either *their* blood-stained carbon footprint heavy conflict oil or *our* enlightened, democratic, less-carbon intensive (by no easily defined or apparent standards) oil.

Carbon footprints metaphors in this contact zone here offer the initial affective mediation into a world divided along so many other lines that reify a (carbon) citizenship orientation geared inwards towards the nation. Urging Canadian citizens to make this virtuous choice aims to collect together the people and groups in Canada who are internally divided on the issue of bitumen extraction. Arranging dissent against a foreign detestable other diminishes dissent within the nation on this issue. Such an arrangement also amounts to support for the current government of Canada's platform of bitumen development as the economic driver of health and wealth of Canadian citizens well into the future. 'Ethical' carbon footprints thus ensure citizen prospects for years to come in a liberal environmental citizenship regime.

Latta's elaboration of dominating citizenship regimes offers a key window into understanding how the possibilities for carbon citizenship are constrained by citizenship norms that exist within and across nations. In Latta's case study of the development of a hydro-electric dam on Mapuche territory, an "energetic nationalism" was organized around the "plenty/scarcity" discourse of energy and its relationship to development and national security, especially in light of potential dependence on natural gas from Argentina, with whom Chile has had fraught relations (2007a, 233):

The effect of drawing hydroelectric energy into the ideological space of developmentalism and national security is the self evidence of an appeal to the "common good" and hence the construction of a particular model of citizenly virtue. If sustained economic growth is the core national project – the fundamental good – then virtuosity, as a quality of citizenship, must be located in the ability to invest in productive activity. (ibid., 233)

Although the actors are different in the case of Canadian carbon citizen's virtuous behaviour in support of "ethical oil," the tendency is similarly geared at a common good that features developmentalism and national energy security. Given the recent recession

that has impacted many Canadian citizens, the discourse appealing to job creation is especially potent at both the provincial and national levels. In a concerted effort to mobilize the popular appeal of Levant's "ethical oil" narrative in the wake of the publicity of the book release, Prime Minister Stephen Harper stated:

The oil sands are a very important resource for our country, it's a source of economic growth and jobs across the country, not just in the West, but in Ontario and Quebec, too. It's critical to develop that resource in a way that's responsible and environmental and the reality for the United States, which is the biggest consumer of our petroleum products, is that Canada is a very ethical society and a safe source for the United States in comparison to other sources of energy. (Chase 2011)

Here Harper not only affectively appeals to the job creation motivation for citizens, but he asserts the need for Canadians to line up behind the "ethical oil" narrative as a connection to our neighbours to the south who are our biggest customers and fellow lovers of liberal democracy.

The support for this regime of carbon citizenship also attaches the platform of development, health and wealth of the nation to the discourses of the abundant natural resources that have long supported Canadians since before the emergence of the nation. Mobilizing Ezra Levant's "ethical oil" narrative, Danielle Smith former leader of Alberta's popular Wild Rose party insists, "[w]e are an energy producing powerhouse situated amongst the unparalleled natural beauty of majestic mountain peaks ... and thick northern forests." (Christian 2010). These attachments reveal how "a particular set of political natures (resource nature)...correspond to a key axis within the dominant model of citizenship" (Latta 2007, 233). Like Levant's politicization of bitumen as a natural resource used even before settler contact, this narrative of co-present energy production and pristine wilderness affectively urges Canadian citizens that there is no cause for

concern; sustaining nature and fossil fuel extraction-based economic development are intractably “Canadian.”

Such nation-oriented health and wealth discourses are found not only in carbon footprint contact zones in Canada, but more widely. In England, where discourses around citizenship are prevalent, the following excerpt comes from the Responsible Citizen website:

Carbon emissions have hit the headlines in recent years and many people are concerned with driving down their *carbon footprint*... Although helping the environment does begin at home, we should all do our part as good citizens to encourage good environmental practices elsewhere as well, such as in our places of work... The environment and *citizenship* are inextricably linked. We may think that we are only one person and therefore cannot make much difference but if everyone made the same small changes, then bigger leaps forward would soon be made. It is our duty as citizens to both be pro-active in our attitude towards the environment and to help others to do the same.¹³³

This instance shares some attributes of carbon citizenship expressed through other carbon footprint metaphors. Like the authors of “Carbon Footprint of Nations” and ecological citizenship theorist Andrews Dobson, the authors of this text highlight the move from behaviors and action in private homes to those in public spaces as necessary in order to approach this form of (carbon) citizenship. They also use the language of duty, strongly associated with citizenship, to incite citizens to share their practices with others. The practices the web site suggests, however, remain shallow, amounting to trite recommendations to “reduce, re-use and recycle” and presenting these behaviours as a kind of social quest for recognition as a good citizen. “If everyone who does something good for the environment tells one other person, then differences will soon be seen.”¹³⁴ In the only section that slightly gestures at climate change as an issue of concern, the author offers how one might, if motivated, lower the carbon footprint of their transportation: “Of

course, taking public transport is one major way that the Government is trying to encourage us all to reduce our carbon footprint, but this is not always possible. But good citizens could do worse than trying to set up a car share scheme at their place of work.”¹³⁵ Government here is pitched as a kind of overbearing element of control over neo-liberal citizens who are capable of virtuous self-organization (when it is convenient to them). Such comments expose the bias of this particular profit-oriented founder of this organization and website,¹³⁶ and reveal the tensions with which carbon citizenship is riddled.

As is evident in the above instances, carbon citizenship expressed through carbon footprint metaphors can easily amount to a normative reinforcement of a national political citizenship regime that fits into and bolsters a certain dominant transnational order of climate change politics. Carbon citizenships in these instances bring no promise of radical reconfiguration of global carbon relationships as a means of confronting climate change; rather, they return to what I describe in Chapter One through Bernstein as a liberal environmental order. The liberal environmental agenda of “sustainable development” (with an emphasis on development) first manifested in the Rio Declaration has provided a dominant approach to climate change politics that manifests in intra-nation citizenship regimes as well as transnational ones. For as Levant’s ethical oil thesis suggests, these intra-nation citizenship regimes interact with wider economies of scale which feature global competition amongst nations in energy politics. In such cases of carbon citizenship, the affective mediations of carbon footprint metaphors often serve not only to bind bodies in alignment with national regimes of “sustainable” development, but

also to attempt to sever attachments to global others who are connected in complex flows of carbon.

The Value of Carbon Citizenships Mediated through Carbon Footprint Metaphors

The carbon footprint metaphors in the contact zones highlighted in this chapter suggest carbon citizenship as a set of struggles that play out across a complex field of interacting scales. The promising kinds of struggles that I analyse in the first part of the chapter relate to how intersecting global, national and cross-sectoral political communities are drawn together through the carbon footprint metaphor. Theoretically suggesting that global citizens are equally deserving of rights to benefit from carbon flows as emissions and equally responsible for lowering disproportionately large emissions legacies; promising struggles over carbon citizenship mediated through this metaphor attend to such relations. While politically instituting what might seem to be a moral community of carbon footprint makers is not a simple task, nor one that is (or ever will be) complete, the contact zones that I explore reveal the metaphor as a mediator through which these crucial relations might appear and inform emerging global climate governance schemes. Citizenship even in its non-ecological theorizations, involves a struggle over inclusionary principles, rights and responsibilities. As Rancière notes, right from the beginning of citizenship theorizations with Aristotle, there have always been those who have been left out of the count of citizens (Rancière 2004); the value of citizenship as a theory is that it provides terms for considering participation in politics. The emerging theories of ecological citizenship and their associations with carbon footprint metaphors bring new perspectives of crucial global material-ecological relations into consideration. Such relations are currently characterized by asymmetries and as such, when these are brought

into visibility through carbon footprint metaphors, certain forms of redressing asymmetry (like Contraction and Convergence) reach the agenda of global climate change politics. The contact zones cited above serve, as Latta suggests, “to draw some of our attention away from questions of what ecological citizenship might look like as normative theory, and to redirect it toward the equally compelling possibility of using the turn toward citizenship as a springboard for advancing the democratic impulse that has long been one of the hallmarks of environmentalism” (2007a, 378). The democratic impulse at a global level of climate change politics features the contributions of many, both from developing and developed countries, who are taking a climate justice perspective. By contrast to a risky citizenship regime in which citizenship is used to bolster certain conventional neo-liberal resource development projects in nations, carbon citizenship at this historical moment may be especially ripe a concept to keep open to shifting communities that are both political and ecological. Though fellow (carbon) feeling may serve to reinforce an us/them policed national boundary of citizen virtuosity as it does in the carbon footprint metaphor forwarded by Ezra Levant, in other instances the same metaphor, with different associations may prompt contesting forms of carbon citizenship. The difference between the promises and the risks pertains to the ways in which political communities are being drawn together and apart. My contention is that the most promising struggles over carbon citizenship necessarily involve: 1) understanding a transnational community of citizens who are aspirationally ‘equal’ - as carbon flows are necessarily transnational; and 2) understanding and redressing the ways in which these citizens are not actually equal at the present due to different legacies and entitlements that have shaped global political relations.

As this analysis reveals, the carbon footprint metaphor does not speak singularly for this agenda of equality of carbon citizens; however taking carbon citizenship as a site that is brought into visibility through carbon footprint metaphors reveals the struggles of global world-making at a time of changing climates. Attention to the affective mediations of carbon footprint metaphors affords critical attention to how people are being drawn together (or apart) in political collectivities and the responses that might ensue from such politically a/effective orientations. Crucially, there is good reason to be sensitive to the limits of citizenship as it relates to historical patterns of dominance. As Bowden suggests, ‘the ideal of global citizenship is inextricably linked to the West’s long and tortuous history of engaging in overzealous civilising-cum-universalising missions in the non-Western world’ (Bowden, 2003; 350); yet as Jamie Lorimer suggests not all particular encounters with citizenship may be reduced to this context, especially if such citizenships are enriched by the possibilities of larger than human sense of membership and relationality (Lorimer 2010).¹³⁷ Notably, Alex Latta’s latest addition to the theories of ecological citizenship opens toward posthuman and spiritual conceptions of socio-ecological relationships (Latta 2013, 566). Perhaps, however, like discourses of subjectivity, the discourses of citizenship are too over-written by anthropocentrism, so citizenship even as a metaphor may carry the burden of this weighty history. In the next chapter, I turn away from ‘carbon citizenship’ associations with the footprint toward the metaphor’s attachments to what I call ‘carbon vitality’ as a means of shedding some of these anthropocentric burdens associated with the carbon footprint.

Chapter Five: Carbon Vitality¹³⁸

If you and four friends go for dinner and drinks and each have a farmed-shrimp cocktail, that releases 990 kilograms of carbon into the atmosphere. That equals burning 424 litres of gasoline. And apparently, compared with the shrimp eaters, you can drive from Vancouver to New York City in a Prius and claim the moral high ground when it comes to calculating your *carbon footprint*.¹³⁹

On February 17, 2012, *The Tyee*, an on-line West-coast alternative news publication, featured a story with a headline “Jumbo-sized Carbon Footprint of Farmed Shrimp Tracked by Scientist.” This story and the scientist mentioned, aquaculture researcher Boone Kauffman of the University of Oregon, use the currency of the carbon footprint metaphor to present a novel calculus of the relative impacts of eating farmed shrimp. This story appears as potent “news” in a variety of public places because it reveals a surprisingly large impact of a farmed shrimp, an impact that comes into visibility only when one looks at a complex set of ecological relations and processes that have thus far remained under-acknowledged in the politics of climate change.

While one could read this contact zone of the carbon footprint metaphor as continuous with a kind of liberal environmental carbon subjectivity as described in Chapter Two, I am initially interested instead in following the attachment of a footprint to a shrimp as offering a novel distribution in the sensible in the life of this metaphor. In order for this instance to make sense, one must follow mediating connections that account for particular carbon flows that are at once local and transnational and feature a highly diverse network of ecological actors across scales. These ecological actors are as ontologically diverse as: human shrimp eaters; the farming practices of the shrimp aquaculture industry; the shrimp themselves; the local peoples in mangrove ecosystems; and the mangroves (themselves multi-form) within these coastal ecosystems.

In this chapter, I explore the promises and risks of tracing the carbon footprint of jumbo shrimp towards these other ecological actors who appear in this larger-than-human affective connection through what I call “carbon vitality.” Carbon vitality promises an affective attention through carbon flows to what Jane Bennett calls a “range of the nonhuman powers circulating around and within human bodies” (2010, ix). I am following Bennett’s notion of vitality as it gestures toward the capacity of non-human actors “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” (ibid., viii). The problematic carbon footprint of shrimp reveals an unintended consequence of human design in a global aquaculture industry; the shrimp and other ecosystem actors connected with this footprint visibly emerge as forces with trajectories, or tendencies which trouble the partial vision of human design. Understanding these force relations and shifting processes enables novel understandings of the sentience of non-humans and offers a potentially deepened sense of distributed agency as an intervention in cultural politics of climate change.

While extending the reach of this metaphor offers increased visibility of vital non-human actors and relations in specific ecologies, such an extension of the metaphor also carries over the all-too-familiar risks of rendering such actors into objects to be managed through attaching them to a human-determined carbon economy. Specific ways of capitalizing on carbon vitality in this case, turn into a risky form of “carbon capital” in which these actors are belatedly valued as commodities and subsequently treated as instruments for human profit generation rather than as important actors with trajectories of their own interacting in larger-than-human systems. In such cases, the way that the

footprint “shifts its affections into action” (Seigworth and Gregg 2010, 2) offers no promise of emissions-reduction through distributed agency, but instead bolsters attachments to carbon markets that often have the opposite effect of increasing emissions. Tracing the carbon footprint of shrimp in this chapter thus attends both to the promises of re-configuring relations as they connect with ecological sensibilities, and to the risks involved in re-connecting these sensibilities to “ecosystems services” approaches that monetarily evaluate – and potentially commodify – ecological relations from the perspective of the benefits that humans derive from ecosystems (Costanza et al 1997; 2014).

This particular carbon footprint metaphor involving crustaceans merits attention for two reasons that I develop below. First, it appears more recently in the discourse of climate change (February, 2012), revealing that the metaphor continues to have traction in scientific and public spaces. Second, although not the only case of carbon footprints implicated in human food systems – perhaps the most iconic case to date has been the carbon footprint of rainforest beef – this textual contact zone shifts attention to the aquatic spaces that are often forgotten for terrestrially-bound dominant human societies. This shift, as the following analysis reveals, permits a novel distribution of the sensible in which previously excluded actors appear in climate change politics through the associated metaphor of “blue carbon.”

The carbon footprint of jumbo shrimp story is especially remarkable for its purchase in a wide array of public contexts at the time of its release; this powerful purchase, I argue, relates specifically to its reinvigorated (though still implicit) metaphoricity. *The Tye* cited above, was just one of many sites that featured Kauffman’s

analysis of coastal ecosystems of Southeast Asia through this metaphorical framework. After Kauffman's presentation in Vancouver at the annual meeting of the American Association for the Advancement of Science (AAAS) in February 2012, this carbon footprint metaphor travelled widely. The AAAS, the "world's largest general scientific society" whose mission is "advancing science, serving society,"¹⁴⁰ represents a key venue in which scientists share and communicate findings with other scientists, educators and the media who further disseminate findings for other publics. The carbon footprint of jumbo farmed shrimp soon made the headlines in many popular and specialist news sites, including: *Phys.Org*, a leading source of non-partisan science and technology news geared at scientists, researchers and lay-publics with a readership of 1.75 million monthly;¹⁴¹ Dawn.com, the on-line version of Pakistan's widely-read English language newspaper;¹⁴² Restore America's Estuaries, a national wetlands conservation not-for-profit in the United States;¹⁴³ and bon appetit.com, a daily news feed based on the popular American food magazine by the same name.¹⁴⁴ The headline in the latter publication reads "Imported Shrimp Has a Carbon Footprint Ten Times Higher than Rainforest Beef"¹⁴⁵ and leads with an evocative animated image of a huge shrimp inside a Hummer luxury sports utility vehicle.¹⁴⁶ The diverse range of venues for this story attests to the power that the metaphor wields within a wide range of publics; while scientific analysis often requires translation of key concepts and frameworks, the carbon footprint metaphor itself is preserved in all of these venues, comprising a key element of the headline in most of the articles. This metaphor is indeed unique, as mentioned in Chapter Two, in that it often combines a scientific quantitative authority with the currency of its qualitative public appeal. In this case, the carbon footprint is used explicitly as a metric

by Kauffman, whose research was extracted in multiple news stories, and the metaphor itself, a now iconic public figure, also appears in each of these multiple news stories. For a public already sensing climate change politics in and through carbon footprint metaphors, this story's traction was already largely ensured by its mobilization of the footprint metaphor.

At first glance, the human originator of the carbon footprint analysis in this story, scientific researcher, Boone Kauffman, appears prominently in all the articles. In his analysis of the carbon footprint of jumbo farmed shrimp, Kauffman tracks the practices of a global shrimp-farming industry to specific locales in Southeast Asia where mangroves and their bio-diverse coastal ecosystems have been decimated to make room for shrimp farms. Within global science and policy circles, these mangrove ecosystems are only recently starting to be appreciated for their role in shaping carbon cycles. These recent scientific accounts suggest that through complex relational processes transpiring over millennia, carbon has settled into root systems in mangrove ecosystems and away from atmospheric warming influence (Nellemann et al 2009). The account of carbon footprints here tracks what is lost, (and what is gained in harmful carbon emissions) in the production of shrimp through the up-rooting of mangroves, whose complex carbon associations were previously not sensed within a normative, peopled distribution of the sensible of carbon footprint metaphors. Kauffman's calculations, based on large-scale shrimp farms that generally last only 5 years, suggest that "a 100-gram shrimp cocktail represents an 'astonishing' 198 kilograms of carbon dioxide from the loss of the mangrove" (Stokstad 2012).

Despite beginning with the human researcher in this case, one quickly finds that the metaphor in this jumbo shrimp story, its affective associations prior to this instance, and most importantly, its “co-author” species, are all implicated in a way that troubles a singular human authority. This is not to suggest that the various actors all stand on equal footing vis-a-vis the power they wield in this metaphor, but to concede to what Jane Bennett (following Latour) calls a “decisive force” of non-human actors/actants that can “catalyze an event” or movement (2010, 9). The metaphorically-mediated emergence of such actors situates carbon footprint metaphors as catalyzers of novel inclusions in the politics of climate change as I describe below..

The Promise of Defamiliarizing Attachments Mediated by Footprints

This contact zone reveals the promise of carbon footprint metaphors to affectively mediate emerging ecological sensibilities prompted by actors that have not yet been accounted for; carbon footprints are thus never too distant from their metaphorical conditioning but are constantly re-charged to account for shifting ecological matters and carbon flows that impinge upon their always-contingent bearings. Now approaching the second decade since first connecting human carbon subjects to accounts of climate change, carbon footprint metaphors in these contact zones reveal a power of heterogeneous larger-than-human actors to displace an accepted account of a human-dominated ‘family of things’ indexed through the footprint metaphor. In other words, these metaphors have been around long enough to achieve a kind of popular cultural recognition, but in this instance the carbon footprint metaphor defamiliarizes previous human-specific attachments; this contact zone more centrally orients toward ecological actors in vital relations and processes of land and sea constituted within the footprint and

within the broader cultural and material story of climate change. The re-figuring of these new actors merits public attention, especially in media contexts with notoriously short attention spans that require novelty to be newsworthy. Just when the carbon footprint (metaphor) seems to become fixed and locatable within a sensible territory that might permit its (human) management, it shiftily makes another impression conditioned by the living relations and processes that animate it in new ways. The novelty of this materializing carbon footprint is what makes it powerful and what stimulates a discursive flurry of attention in its wake.

The associative and comparative work of the carbon footprint metaphor – such that in the lead quotation, for example, the consumption of gas in a car can be compared with consumption of farmed shrimp – is central to the politics of affect it activates. By drawing on familiar associations with large emissions-generating activities, and connecting these to newly visible carbon relations, a generative shift occurs in the relational politics that follow. True to its metaphorical formation, the carbon footprint metaphor in this instance responds to epistemological lacunae that mark this historical juncture of ecological crises. The carbon footprint has not yet mediated the relationships between farmed shrimps and larger-than-human mangrove ecosystems into view. The political disturbance to the status quo of carbon footprints initiated by this appearance reminds that the previous accounts written into footprints were partial (just as this one necessarily is). Since footprint metaphors move alongside shifting affective relations and accounts of carbon, their associative force similarly shifts. While the carbon footprint metaphor begins at the turn of the millennium as both an accounting tool and a qualitative account whereby human subjects historically newly register within the cultural politics of

climate change, the calculus and qualities written into the carbon footprint's inscriptions necessarily shift. These metaphors begin with somewhat explicit recognition of gaps in human knowledge and language and rely on multiple associated metaphors to catalyze sense-making for new forms of social and ecological relationality within historical-ecological contexts; thus, for example, do carbon footprints lead to formulations of "blue carbon" affectively mediating attention to aquatic flows of carbon (discussed below). To matter in new ways that the above article makes clear it should, the carbon footprint metaphor here becomes newly charged with these novel force relations. Simultaneously mobilizing a sense of familiarity, but presenting novelty which allows it to achieve wide dispersal in public contexts, the carbon footprint metaphor re-configures a vital politics of climate change.

Carbon vitality

To be sure, the carbon subjects first hailed by carbon footprint reduction lists in no way completely disappear in this instance quoted above (as discussed below), but the contact zone of the footprint metaphor here is also explicitly populated by non-human actors who appear to "have" a footprint. That is not to suggest that these beings suddenly come into existence with the transcendental "word" of human creation through the endowment of a metaphorical footprint to non-humans; but rather, that these actors come into the visible and speakable terms of climate change politics through a force of relations and processes that is affectively mediated through the metaphor. The carbon footprint metaphor remains an opening to lively forces that exceed the account thus far and thus its shifts generate a Rancièrian political act that "repartitions the sensible...overthrows the regime of the perceptible" such that new publics come into view (Bennett 2010, 107).

I am calling this affective force of relations and processes “carbon vitality” because: 1) the metaphor of “vitality” is explicitly suggestive of moving relations and processes that animate carbon flows; and 2) as Jane Bennett insists, the moving relations and processes indexed by the metaphor of vitality are not pre-figured with specifically human ontologies, but are open to larger-than-human entanglements (2010). Like carbon subjectivity and carbon citizenship, carbon vitality gestures toward affective attachments made through carbon footprint metaphors; however, vitality’s explicit insistence on movement and larger than human force relations sets in motion attunement to a different kind of political resonance. The affects of ‘carbon guilt’ and ‘fellow feeling’ associated, in turn, with carbon subjectivity and carbon citizenship, rely heavily on affectively connecting with oneself as a *human* subject or with other *human* citizens in terms of carbon flows. Understanding diverse living relations and processes of carbon vitality requires stretching beyond human-centred affects. The affective relations of carbon vitality shift attention away from questions of how human communities are drawn together (and apart) through a politics of citizenship or subjectivity. Like Jane Bennett, I would like to “branch out to an ‘affect’ not specific to human bodies...to focus less on the enhancement to human relational capacities resulting from affective catalysts and more on the catalyst itself as it exists in nonhuman bodies”(Bennett 2010,xii). Understanding the catalytic force of shrimp (and other associates) in this carbon footprint contact zone entails understanding the ways in which carbon flows affectively connect to¹⁴⁷ political actors conceived not solely in privileged human terms.

Notably, carbon vitality is necessarily more amorphous and nebulous as a concept/metaphor than the ones I have been describing thus far in this dissertation

because it is speculative and inherently resists what William Connolly identifies as the tendency towards “complete explanation” (2013, 9). As Connolly suggests, such tendencies prematurely foreclose upon sensitivities to a “variety of nonhuman force fields that impinge upon politico-economic life as it too impinges upon the force fields” (2013, 9). Given the scale and rapidly-shifting pace of contemporary ecological-material entanglements, many theorists are coming to admit that received categories, concepts and sensibilities of the (post)modern age are in fact incapable of explaining current predicaments, such as climate change, let alone helping us to way-find and respond to them (Bennett 2010; Connolly 2013; Morton 2013). Thus, in “explaining” or gesturing toward an affective relation through carbon vitality, one must resist the tendency to “completeness” and instead draw out some provisional and tentative threads that remain provisional enough to allow for the heterogeneous animating forces that displace partial human accounts (even as my own account is also inescapably partial). This is a fraught endeavour, even for seasoned scholars who are self-reflexively un-doing their own previous work in order to grapple with contemporary conditions. Jane Bennett admits to the seeming contradictions of her human articulations of larger than human affects:

I court the charge of performative self-contradiction: is it not a human subject who, after all, is articulating this theory...? Yes and no, for I will argue that what looks like a performative contradiction may well dissipate if one considers revisions in operative notions of matter, life, self, self-interest, will and agency. (2010, ix)

Perhaps rather than contradictions, then, carbon vitality requires us to puzzle through the pressing paradoxes of climate change as a naturalcultural phenomenon in which matter, life, self-interest and agency are, from the outset, infused with larger than human considerations, even as these considerations are not immediately available to us through

our received sensibilities. The carbon footprint metaphor itself, as a mediator in this contact zone, “considers revisions in the operative notions of matter” by being pulled into novel forces of encounter that shape it, and re-direct its vital orientations. These revisions and disturbances enabled through the metaphor’s mediations are crucial to its political offerings.

Jane Bennett’s affective politics of vitality begin with the “recognition of human participation in a shared, vital materiality. We *are* vital materiality and we are surrounded by it, though we do not always see it that way” (2010, 14). Rather than reifying subject/object relations which often map onto a human/nature divide, Bennett follows the vitalist principles of Spinoza and Deleuze to conceive of affective forces of “heterogeneous assemblages” (Bennett, 23). The notion of such an assemblage re-works the term of agency whose traditional “efficacy or effectivity...becomes distributed across an ontologically heterogeneous field, rather than being a capacity localized in a human body or in a collective produced (only) by human efforts” (2010, 23). Bennett suggests a whole vibratory set of dynamics that works in a different register than the limited realm of human instrumentality, a world where no individual agent is singularly responsible for causal events, and where contingency or “chanciness resides as the heart of things” (ibid.,18). The political task for Bennett then, is “to cultivate the ability to discern nonhuman vitality, to become perceptually open to it” (14).

From this vitalist perspective, the carbon footprint metaphor in its affective mediations of shifting larger than human relations becomes a potential opening. As my analysis of this textual contact zone reveals, this metaphor can help to cultivate attunement to larger-than-human vitality as an intervention in cultural politics of climate

change. If we, who tend toward attempts of complete explanation and instrumental management but who inescapably apprehend through partial vision and situated knowledges,¹⁴⁸ refract our gaze upon this carbon footprint of shrimp through an affective lens of carbon vitality, this contact zone cultivates a promising re-orientation.

To begin to understand a complex newly-revealed carbon vitality implicated in this footprint, I take two key actors in this story– the primary catalytic force of shrimp whose footprint is tracked and its associate, mangroves – and read these as cultural-material compounds. That is to say, that although each of these may surely be taken as ‘ecological’ (or even more reductively, ‘carbon’) entities that can be apprehended by science, they are also most emphatically caught up in metaphors and relations that exceed conventional scientific accounts. The footprint metaphor here mediates these cultural associations and material ecological relations in order to make new sense.

Gargantuan Footprint of Shrimp?

One of the ways in which this carbon footprint metaphor re-orient perception is by enacting a kind of dissonance between “shrimp,” a metaphor that figures smallness in anglophone cultural contexts, and a seemingly impossibly large “footprint” in terms of carbon emissions. Kauffman’s findings bear repeating here: “a 100-gram shrimp cocktail represents an ‘astonishing’ 198 kilograms of carbon dioxide from the loss of the mangrove.” The difference in weight between the 100-grams worth of shrimp and 198 *kilograms* of CO₂ does indeed seem astonishing. Notably, there has been some critique of Kauffman’s quantitative findings by The Global Aquaculture Alliance (GAA)¹⁴⁹, “an industry group underwritten by Wal-Mart, Red Lobster, and multinational seafood importers” (Carrier 2009, n.p.),¹⁵⁰ whose main concern in a press release were the “anti-

shrimp headlines” in the many articles that followed Kauffman’s presentation. But even if the numbers are ‘off’ as numbers interminably can be (conspicuously, the GAA did not immediately provide its own competing carbon footprint analysis, but belatedly commissioned a report to refute the findings based on one study of shrimp farming in one province in China),¹⁵¹ the story still reveals an order of magnitude difference in weight of carbon emissions resulting from upheaval of coastal ecosystems compared to the weight of a measly 100 grams of shrimp.

Further, while the numbers in this analysis do tell a quantitatively potent story, the dispersal of this carbon footprint metaphor also suggests that numbers are not sufficient unto themselves to catalyze public attention. In fact, ‘the numbers’ on the socio-ecological impacts of mangrove ecosystem destruction caused by shrimp farms have been around for more than two decades, although not so prevalently within public lay contexts in the Global North. Scholarly publications and news articles in Southeast Asian press suggest that local communities within mangrove ecosystems in the Global South have long been observing the ravages of shrimp farms along coasts (Hein 2000; Menasveta 1997; Stevenson, and Burbridge 1997). This new apprehension of the relevance of this story and attention in the Global North gestures at both a quickening of consciousness that makes carbon a matter of global concern and, importantly here, the mediating effects of the figure of the carbon footprint metaphor itself that affectively brings these relations more proximal and visible. To make sense of the gargantuan numbers implicated by tiny shrimp requires the mediation of the carbon footprint metaphor and its associated figures that animate these numbers in particular ways.

The astonishing weight of carbon emissions of tiny, yet “jumbo” shrimp, mediated through the carbon footprint metaphor, is yoked to a variety of other analogous weights (as CO₂ emissions) of different entities in presenting this figure for a variety of publics. *The Tyee*, for example suggests that the amount of carbon emissions/footprint from (farmed) shrimp cocktails at a group dinner is equivalent to the emissions footprint incurred from driving from Vancouver to New York City in a Prius hybrid vehicle. The *Bon Appetit* article headline, “Imported Shrimp Has a Carbon Footprint Ten Times Higher than Rainforest Beef,” similarly works through creating a connection between the notoriously sinful practices of the Rainforest beef industry, which surprisingly emerges here as less destructive than shrimp farming according to Kauffman’s carbon footprint analysis. In *The Atlantic Wire*, after the headline “Your Shrimp Cocktail is Ruining the Planet”, Dashiell Bennett leads with the sentence “A biologist has calculated that these tiny little shrimp may be the most costly animal you can eat when measured in terms of its negative impact on the environment”(Bennett 2012, np). These analogies mobilize already available associations with bigness or weightiness in term of climate-impacting emissions and yoke them to the carbon footprint of shrimp. The Rainforest beef comparison is particularly evocative since this bovine-turned-protein figure stands as a twice-indicted climate villain in public discourse; both its legendary methane-releasing ruminant belches and the necessity to destroy carbon sequestering rainforests for its pasture have given this form of life/protein/industry the reputation as the worst of the worst (Cederberg et al 2011; Desjardins 2012).¹⁵² That shrimp could possibly have a carbon footprint equal to, let alone ten times the size (weight) of Rainforest beef seems to defy previously held public schema. The accompanying image of a shrimp driving a

Hum-V in this article further brings ‘home’ to a consuming global North the enormity of this impact, as the shrimp is connected to another particularly iconic figure of privilege and destructive impact.¹⁵³ This carbon footprint (of shrimp) metaphor therefore evocatively raises the question “How can a little thing figure so prominently?”

The weightiness of farmed shrimp is explained in some of these articles simply, but problematically, by numbers of shrimp indicating a wealth of supply. Sam Dean, author of the *Bon Appetit* article suggests that “the glut of cheap South Asian shellfish is what’s turned shrimp from a luxury item (remember when shrimp cocktail actually seemed fancy?) into an everyday, Taco Bell and Red Lobster kind of meat.” While Dean and others (Philpott 2012) name a “glut” of cheap South Asian shellfish as the cause for the novel quotidian quality of shrimp as food, the causes are clearly more complex than those addressed by the supply side of a supply and demand consumer equation. To weigh so heavily in climate impacts pertains to the processes necessary to produce shrimp in a farmed environment where pre-existing ecological relations are violently disturbed, as well the numbers of humans who are increasingly consuming and demanding these within complex political economies. In order to “feed the world” through aquaculture (as is the mission of the Global Aquaculture Alliance, and its affiliates, Red Lobster and Wal-Mart, among others),¹⁵⁴ new coastal territories must be appropriated and developed since the wild stock of shrimp cannot keep up to demand, especially the demand for cheap protein in a sea of industrial agriculture. This abundance of cheap shrimp identified by Dean and others must therefore be connected with multiple cultural and material contexts.

One of these cultural-material contexts is the “Blue Revolution.” Like its metaphoric predecessor, the Green Revolution, which gestured at a promise to feed a growing human population through efficiencies gained by scaling up terrestrial forms of agriculture, the Blue Revolution evokes similar pretensions of feeding the world through scaling up industrial aquaculture. As John Volpe warns, however, the profit-orientation of this revolution trumps any seemingly altruistic attempts to feed the world and the results in blue revolution practices are “[b]ioamplified toxins in flesh, exotic escapees threatening already diminished wild stocks, and farms acting as incubators for parasites and pathogens” (Volpe 2005, 302). Inevitably, through this logic, farming ecosystems first conceived as ‘closed’ collapse as the human engineers and financial beneficiaries of these systems seem unwilling and/or incapable of sensing all the multiple intelligent interactions between biodiverse ecological actors within lively ecologies. Farmed shrimp are caught up in this promise of affordable protein for the world, but as this carbon footprint reveals, their affordability is highly troubled when it comes to other ecological impacts that bear upon climate change, among other important concerns such as social justice.¹⁵⁵

Just as the promises of the Green Revolution are currently fading beneath its characteristic short-sighted mechanistic approaches to industrial agriculture, the Blue Revolution is now appearing here through the carbon footprint of shrimp to be similarly susceptible to collapse leaving degradation in its wake. Kauffman tracked many shrimp farms that lasted only five-ten years and left contamination which rendered coastal spaces “unusable for another forty years” (Bennett, 2012). A related problematic issue identified by Volpe in this process is Jevons Paradox (a notion I described in Chapter Two)

whereby efficiencies gained and translated into cost reductions passed on to the consumer, are eventually lost because of an increasing demand for the product - in this case, “cheap” shrimp. A taste for shrimp has expanded within the Global North, on the one hand bringing a former luxury menu item for the privileged to a more affordable everyday “Taco Bell” status;¹⁵⁶ on the other hand, however, this expanding fast food commodification of shrimp has not only overturned long-standing mangrove forests, it has also created social injustices for coastal peoples in the Global South. In the wake of the Blue Revolution mono-cropping of shrimp in Bangladesh, for example, local people who formerly made a living from fishing the wild stocks of fish within mangrove ecosystems are finding themselves without fishing grounds, without power, and therefore, without the means to make a living. Many of these affected people have made strong appeals to consumers to stop eating shrimp from these devastating shrimp farms.¹⁵⁷

Metaphorically revealed through the footprint, a growing taste for shrimp in the Global North appears enabled by a particular lens that sees shrimp as small and cheap through a distancing of the vital contexts in which they are produced. The stripping bare of coastal ecosystems parallels a cultural purification that figures a clean shrimp as a healthy choice for a privileged consuming carbon subject. This carbon footprint reveals that shrimp is at once a cultural construct as a food choice, and a material-ecological entity with trajectories and forces of its own that do not always conform to human design and instrumentalism. Though (certain) humans may figure farmed shrimp through this purification which strips the ecological relations and histories of production attached to it,

the metaphorical mediations of this footprint promise to re-connect vital associations and re-configure political sensibilities.

At first glance appearing only to specify a particular relationship between a carbon subject/consumer of shrimp and shrimp as a product, the shrimp itself carries a force in a distributive agency that disturbs a normative sensibility of carbon footprints as terrestrial-atmospheric impressions made by people affecting themselves (as subjects) or other people (as citizens). That aquatic creatures without literal feet could conceivably have “footprints” suggests a revision in thinking about carbon impressions, relations and processes that occur in cultural blind spots, especially those aquatic blind spots that are newly signalled by the metaphor “blue.”

“Blue” Carbon, Social-Ecological Sentient Mangroves

The carbon footprint of shrimp story affectively mediates into visibility coastal ecosystems in which mangroves and their larger-than-human associates interact in vital carbon relations. Despite the brief length of the news stories in which the carbon footprint of shrimp appears, many of these stories explicitly connect the footprint of these shrimp with mangroves whose upheaval are the central reason for the weightiness of the shrimp (Isabella 2012; Philpott 2012). One story notes that “the value of intact mangroves is hard to measure” naming a vital capacity of mangroves in “protecting the coastal ecosystems and communities against storms and tsunamis” (Phys.org 2012, np). Another states, “[m]angroves, it turns out, are rich stores of biodiversity and also of carbon—and when they’re cleared for farming, that carbon enters the atmosphere as climate-warming gas” (Philpott 2012, np).

Mangrove forests have always been fully implicated in these aquacultural practices and their smaller scale conventional predecessors, but these forests have remained largely hidden from view until recently in the Global North through norms that distance these supply chains and their impacts. What appears through this footprint of shrimp story is (among other things) a coastal ecosystem that pre-dates human intervention and that is largely invisible to certain terrestrial beings¹⁵⁸ whose partial vision is built with neither underwater lenses nor with the multi-species sensory capabilities necessary to fully appreciate complex associations and processes. In the process of creating shrimp farms, thereby making shrimp a more affordable protein for an increasing portion of the people of the planet, the coastal ecosystems in many parts of Thailand, Bangladesh and other countries have been rapidly overturned. Local peoples can apprehend this destruction in an immediate way (though importantly global asymmetries of power may prevent their interventions)¹⁵⁹ and scientists may have instruments and data to make “objective” sense of these impacts; however, wider publics who are implicated from afar require other affective means to re-compose a sensory field that is removed from immediate visibility. Metaphoric connections are key in this regard and this is what is at stake in this carbon footprint of jumbo shrimp; this metaphor serves as a means of creating a certain affective connection between distant consumers of shrimp and their legacies in particular coastal localities in which the farming takes place.

The carbon footprint metaphor brings into visibility “blue carbon,” an emerging metaphor signalling human understandings of crucial carbon relations embedded in coastal ecosystems. This metaphoric shift re-distributes a sensible regime of carbon that had been previously and consequently largely forgotten. Whereas a universalizing and

indistinguishable “carbon” (itself a stand-in for carbon dioxide and other greenhouse gases) formerly stood out as the key figure to be apprehended, specifying adjectives/metaphors are now coming to define how carbon’s particular relations are determined in material and cultural contexts. Pointing to the dominance of vision in the politics of human perception, colours become the specifying signifiers of these particular human-defined contexts of carbon. *Brown* carbon has come to refer to anthropogenic greenhouse gas emissions “from energy use and industry;” *black* carbon to “particles resulting from impure combustion, such as soot and dust;” *green* carbon to “terrestrial carbon stored in plant biomass and soils in forest land, plantations, agricultural land and pasture land;” and *blue* carbon to that which appears in coastal ecosystems “particularly mangroves, marshes and seagrasses.” (Nellemann et al 2009,15). The late appearance in discourse of *blue* carbon relative to its chromatic siblings, previously all figured under a generic “carbon,” addresses a dominant tendency among certain (especially distant or non-coastal) peoples to forget the oceans, from which all life forms are thought to have emerged and in which much of the species of the world still live.¹⁶⁰ While oceans have been normatively and symptomatically relegated a minor role as a conveyor of human vessels, resource for food, and a place from which to launch offshore resource extraction, the blue carbon metaphor newly situates oceans as integral and complex networks of animate actors that contribute to the carbon cycles implicated in climate change. A scientific apprehension of blue carbon suggests that ecosystems indexed through this metaphor “are being degraded and disappear at rates 5 – 10 times faster than rainforests” and as emerging research is showing, their carbon storage capacities are far more profound than terrestrial systems (ibid.).

Although the above quantitative scientific *land management* lens offers but one reductive angle from which to view the sea as integral to carbon relations, the metaphoric frame of blue carbon that names the relationship in the report from which it is extracted, opens up to wider possibilities of revising what counts as matter, life and agency. Water and all of the lively interactions within and through it, are figured here as quintessentially important ecological and climatological actors. While our home planet is normatively defined as “Earth,” the planet itself and its blue ecosystems challenge the singularity of this moniker. Notably, the metaphor of the “blue planet,” based on the view of its dominant oceanic constitution as seen from space, presages the importance of water for a popular imaginary and for material ecologies in the twenty-first century. Building on this extended metaphorical vision of *blue* as it orients toward water, the blue carbon metaphor is centrally implicated in the ways in which this carbon footprint metaphor enfolds complex relationalities and processes of carbon vitality; these metaphors are pivotal for novel understandings as they are capable of accounting for the particularities of these relationships and processes that go on below or above the surfaces that are normally visible. Here the carbon footprint metaphor displays the movements associated with affect by being “pulled beyond its seeming surface-boundedness by way of its relation to, indeed its composition through, the forces of encounter” (Seigworth and Gregg 2010, 3). While a carbon footprint might normatively gesture towards the surfaces of terrestrial relations that generate atmospheric effects, here coastal spaces weave in aquatic forms of carbon vitality that lead to novel perceptions.

Through the shrimp story, the carbon footprint metaphor leads to blue carbon and yet other associated metaphors described evocatively here by Steven Bouillon:

Mangrove forests consist of a consortium of tree and shrub species adapted to cope with the saline conditions and fluctuating water levels that characterize their environment. One such adaptation is the development of different aerial root systems, such as stilt prop roots...that anchor the plants in the sediment and allow oxygen to penetrate the submerged roots. These complex root structures also slow down incoming waters during tidal inundation, causing much of the suspended material in the water column to settle onto the sediment surface. This highly efficient particle-trapping mechanism leads to the sequestration of carbon not only from the mangroves...but also from outside the ecosystem, including from rivers and adjacent seagrass meadows. (2011, 282)

Although Bouillon, a scientist in the field of soil and water management, describes a kind of mechanistic functionality of a mangrove ecosystem through the metaphor of ‘sequestration,’ he also notably creates an opening for an affective re-composition of these same ecosystems, whereby the mangroves themselves perform a poetics of re-figuring terrestrial, aerial and aqua-cultural relations. Mangrove forests, it appears, weave multi-species associations that have developed over millennia and constitute an integral part of the complex planetary carbon flows. The extended description of mangrove forests above paints an image of distributed intelligence or *sentience* that operates in and through associations of water, land and air as they coalesce in mangroves. The description not only figures a poetic image, making it newly sensible, but it also inadvertently dismantles the human construct of manageable bounded ecosystems; whereas the forests are attributed with the power to store carbon from “rivers and adjacent seagrass meadows,” these are conspicuously relegated by Bouillon in the quotation above to the space “outside the ecosystem.” If we listen to them, however, the mangroves are illustrating (in Derridean fashion ¹⁶¹) *that there is no outside-ecosystem*; the sea is constitutive of land and the land, the sea. The affective mediations of the footprint metaphor help to enable such a sensibility: “With affect, a body is as much outside as in itself – webbed in its relations – until ultimately such firm distinctions cease

to matter” (Seigworth and Gregg 2010, 3). Aerial roots of mangroves bring into visibility a constitutive atmospheric relation to Earth and sea, so often taken for granted in modern histories until recent understandings of climate change. Whether we burn carbon, or up-root it, the trace of the carbon footprint through mangroves here exposes an elemental coincidence of fire – air – water – earth.

Although Bouillon’s description does permit a certain ecological understanding of mangrove forests, it tends to remove the human species in its description as well. How can these understandings be both sensible to ecosystem existence prior to and in spite of human interventions, yet simultaneously figure humans as integral within contemporary ecosystems? An active reading of this carbon footprint metaphor draws out a relational ontology that reconfigures existing distributions of the sensible of coastal ecosystems being uprooted through aquaculture. No longer viewed as backgrounded environment or resource, mangrove ecosystems vitally appear in this reading as socialized and sentient spaces where mutual impressions are made. These coastal living spaces reveal particularly rich sensible and porous interactions between water, trees, soil, sea life, and peoples.

Tracing this carbon footprint of shrimp to the mangroves on the Andaman coasts of Thailand, one can sense how material and cultural matter are inextricably interwoven in conceptions of life of the Moken peoples, an indigenous group who have, up until recently literally lived on the seas (in boats) in these regions for over 3500 years (McDuié-Ra 2013). The intervention of P’Noon, a Moken participant in the fieldwork of geographers Nathan Bennett and Phil Deardon (2012) brings some of these conceptions to life for those outside the community: “If you talk about living in the community, the

mangrove has a part in it...if the mangroves survive, then the community survives...the mangroves depend on us and we depend on the mangroves” (Bennett and Deardon 2012, 23). Here the mangrove is centrally figured as part of the coastal sea community; revealingly P’Noon’s description may seem animistically reductive to those accustomed to an enlightenment epistemology of human technological re-making, whereby industrious humans engineer living conditions that often distance us from material-ecological relations. Such a distancing is a necessary feature of the Blue Revolution whose logic enables the clearing away of ecological complexities for mono-cropped shrimp as a profit-oriented approach to creating affordable protein. By contrast to such a logic, Toom, another Moken fisher on the Andaman coast constructs an image of the necessary complexity of relations and processes of healthy ecosystems, which are tellingly and metaphorically constructed as house and home:

Without fertile mangroves, the animals would not be as numerous – shrimps, crabs, fish, birds, snakes, monkeys, squid, small shrimp. Mangroves are very important. It is a house of small trees and it is something that the villagers make use of. When people cut them, it is like you are destroying the home of small animals. (Bennett and Deardon 2012, 24)

Identifying this space as home and describing some of its inhabitants permits a localized valuation of these living spaces and accordingly, potential orienting principals guiding their treatment; such a valuation arrives belatedly in the Global North with the arrival of the carbon footprint metaphor of jumbo farmed shrimp that draws some of these complexities into view. This metaphor certainly implicates mangroves as “carbon sinks” from a land and sea management perspective, but it also implicitly opens up the question: *What can we learn from the sentience of mangroves that would be lost through their*

eradication, and how might such sensibilities contribute to the well-being of humans and non-humans alike?

Mangrove forests can be described as a “consortium of tree and shrub species” as Bouillon does above, but they may also appear as populated rhizomatic edifices in coastal zones that trouble the boundaries between land, water and air. Existing only where these zones melt into indifference, mangroves assemble a plethora of vital activity by selectively trapping and releasing the vibrant matter of coastal life. While their carbon storage capacity can be instrumentalized through the carbon footprint metaphor, this is but one aspect of their sentience that may come into view through this metaphor. In order to follow the seemingly disproportionate carbon footprint of farmed shrimp, this carbon vitality must come into view for a human population that has yet to sense them. Living in reciprocal relations with mangroves is clearly one way of permitting a network of sentience in specific localities. The insights of P’Noon once again make this apparent:

We are Moken so we used to build all of our houses on stilts because they needed to be high up above the water. When I was young, there used to be mangroves in front of the community. They started to disappear when I was in school. The new generation needed more land. I used to jump off the land and there were fish. The front bit of the community would not erode so quickly if there were mangroves. The water just keeps coming in and the sand just washes away. (Bennett and Deardon 2012, 25)

P’Noon’s description affectively recomposes mangroves as a site of childhood play, and a place that was teeming with life, but a site that has disappeared due to recent human-initiated change. Metaphorically re-figured as playful, sentient spaces, the mangrove here takes on new associations and orients towards sensibilities of carbon vitality. The particularities of this sentient space formerly led people to construct their homes on stilts in the water, mirroring the staunch yet permeable intelligence of mangroves in their

transactions with the powerful ebbs and flows of water. Their removal thus represents a greater loss than that of a single species; rather, it implies a profound perturbation in sense and sensibility for all who thrive among the material and cultural spaces of mangroves. For coastal areas particularly susceptible to tsunami, this sentient space is particularly valuable. Following a number of particularly devastating tsunamis in the early 2000s, building companies are not only insisting that coastal mangroves be left intact where they are still in place, but also that if buildings must be constructed in these zones, they be designed to let water through on the ground floors (just as mangroves permit a flow-through of water).¹⁶² Thus, belatedly, human engineers and designers are learning from the intelligent design of these vital relations and processes.

The Return of the Carbon Subject, or Shifts in Vital Kin Relations?

Lest it appear that a diverse range of larger-than-human actors have obtained equal footing in the politics of these metaphors, the headlines in the stories of carbon footprints of shrimp complicate such an interpretation. What is apparent in reading most of the headlines that appear in North American contexts is that the target audiences addressed are liberal human privileged subjects who consume shrimp (“*Your Shrimp Cocktail is Ruining the Planet*”). The carbon footprint of shrimp story thus does rely on an association with a carbon subject, but I argue that the carbon subject in this contact zone is differently implicated in a complex relationship than when she/he was first hailed into climate change politics through the carbon footprint reduction lists; further, while these stories seem to initially hail a carbon subject, they also initiate a gradual shift away from reifying a domestic household carbon subject toward sensing a more ecologically-grounded distributive agency. Whereas the early lists were often ineffectual and extensive

– they simply implicated everything superficially and therefore nothing at the same time
– this carbon footprint metaphor connects to particular ecosystems and creates a more detailed image of that relationality. Because carbon is notoriously amorphous and abstract, the carbon footprint metaphor has the capacity to ground carbon in specific ways by locating it (temporarily and contingently, as footprints always suggest) within specific metaphorical spaces and bringing these specificities of carbon vitality into a political field of vision.

But why should people in the Global North care about these relationships that are seemingly so distant and how does the carbon footprint metaphor connect with this tangential path of mangroves? By following the carbon footprint (metaphor) of shrimp to mangroves in this way, two important observations can be made. First, planetary carbon connections link “us” all, whether we see we are in the same ecosystems or not; as Jane Bennett suggests, even “operative notions of matter, life, self, self-interest...” shift if one concedes that relations of vitality run “alongside and inside humans” (2010, vii-ix). Perceiving carbon vitality means ‘tuning in’ to these already-existing carbon flows and seeing ourselves as one part of the larger distributed agency of such vitality. Seeing ourselves in this way shifts emphasis away from subjectivity; moving away from subjectivity in turn allows for “a better discernment of the active powers issuing from [nonhuman] nonsubjects” (Bennett 2010, ix).

The second important observation centres on the crucial role of carbon footprint metaphors to affectively mediate into visibility these connections of carbon vitality. While in some circumstances the carbon footprint metaphor functions as an imposition that overwrites pre-existing local valuations and attempts to disconnect from existing

distributed carbon vitality as I discuss below, the metaphor can also foster attunement to multi-scale and multi-species sentience vis-à-vis climate change. Critically reading this metaphor and understanding the significance of tracing carbon footprints of shrimp entails following the traces to mangroves which in turn suggest social-ecological sentience, as expressed through the narratives of P'Noon and Toom above. The carbon footprint metaphor invokes novel sensibilities not only through local stories, but through the mangroves themselves whose rhizomatic structure figures carbon relations and processes that defy easy human apprehension through partial vision and simultaneously disturb an either/or politics of local versus global. Repeatedly, the carbon footprint metaphor illustrates that despite certain human pretensions to quantitatively take everything into a global calculus, there always remain excess specificities that cannot be calculated, trapped or sequestered by human subjects in their dominant patterns and communities.

The affective politics of carbon footprint metaphors in this contact zone reveal the potential for an economy of interests that extends beyond individuals and humans to an “in-between-ness” that is open to new carbon relations. As Seigworth and Gregg suggest, “[a]ffect arises in the midst of an *in-between-ness*: in the capacities to act and be acted upon. Affect is an impingement or extrusion of a momentary or sometimes more sustained state of relation *as well as* the passage (and the duration of passage) of forces or intensities”(2010, 1). The carbon footprint metaphor here initiates an impingement on a state of relations as it defamiliarizes both the family of things that have been inscribed as having a footprint, and the dominant ways in which we have come to act upon these footprints. This suspension of familiarity opens up newly visible carbon relations and

processes that permit the entrance of other fellows with whom we may share *kinship*, a crucial affective relationship in an age of climate change. Attentiveness to carbon vitality “...can inspire a greater sense of the extent to which all bodies are kin in the sense of [being] inextricably enmeshed in a dense network of relations” (Bennett 2010,13).

Bennett’s attention to kinship relations gestures at the need for an explicit recognition of carbon connections that go beyond individual subjects and the human connections of citizens; as family relations reveal, kinship needs to be composed explicitly in discourse and practices that foster connections that may be latently there (in human terms through bloodlines, social relations, etc). The same is true for kinship in terms of carbon flows. Though “we” may intellectually understand that we are all connected through planetary carbon cycles, discourses and practices fostering kinship relations are necessary. The associative value of metaphor here is crucial; metaphors affectively “draft maps of the visible, trajectories between the visible and the sayable, relationships between modes of being, modes of saying, and modes of doing and making. They define variations of sensible intensities, perceptions and the abilities of bodies” (Rancière 2004, 39). These trajectories and associations merit close attention.

In many of the articles stemming from the analysis of the carbon footprint of shrimp, attention and care for mangrove ecosystems emerges as a key political action (Isabella 2012; Philpott 2012). These “carbon footprint of shrimp” textual contact zones suggest that mangroves are valuable not only in terms of their carbon storage function on behalf of the planet, but that they are priceless in terms of their distributed agency of care for the larger-than-human kin communities in coastal zones: “[I]ntact mangrove forests are of value in protecting the coastal ecosystems and communities against storms and

tsunamis, such as the Indian Ocean tsunami that killed some 230, 000 people” (Phys.org 2012). Although some of the mechanisms for implementing protection may be laden with implications of normative managerial climate change solutions (as described below), the move to bring these ecosystems into visibility offers an initial intervention of imagined possibilities that were previously unseen in climate change politics. To return to Rancière’s meditation on the politics of aesthetics, “it is a question of constructing an image – that is to say a certain connection between the verbal and the visual. The power of this image is that it disturbs the ordinary regime of that connection...” (2009, 95). The image here constructed through the carbon footprint metaphor suggests that the destruction of these ecosystems may not be as easily offset by carbon subjects paying for their guilt; rather these images, composed of larger than human kin relations, demand different responses that attend to the complexities of carbon vitality.

These systems suggest that no matter how ‘we’ bind carbon (or other ecosystem elements for that matter) to anthropocentric systems, certain constituents always impinge upon these systems as “parts that have had no part” in an existing distribution of the sensible. The carbon footprint metaphor here is revealed for its political promise as re-inscribable through a larger-than-human carbon vitality that impinges upon these “givens.” A key epistemological intervention of the affective connection to mangroves through the carbon footprint metaphor is to remind again of the partiality of human vision and situated knowledges. As Toom suggests, “sometimes, the things that we do make things that we use or eat disappear without understanding why they disappear. We cut down the mangroves to make good things without understanding what this will do” (Bennett and Deardon 2012, 24). The numbers figured through the loss of mangroves in

the carbon footprint of shrimp may be somewhat surprising, thus they make an impact and are “newsworthy” to publics, yet given Toom’s insight into partial human vision and blind spots, it is somewhat unsurprising that unforeseen impacts of human management do occur. Without admitting to unforeseen impingements by actors or “kin” with whom we are entangled in carbon flows, our large-scale anthropocentric interventions are susceptible to such failures of unilateralism. This carbon footprint metaphor reveals that carbon connections may appear anywhere and everywhere, that we share kinship relations with shrimp and mangroves and a host of other actors, many of whom may as yet be unnamed or unaccounted for. While we might attempt to turn a blind eye to such actors by enacting a closure in a given distribution of the sensible, they will appear to claim a place; affective attunement to carbon vitality offers perceptual openings to these actors and processes.

The carbon footprint metaphor here offers the promise of affectively mediating these relations of carbon vitality into the speakable terms of politics. Yet, as affect theorists point out, the “immanent neutrality” of affective mediations suggest that we must also remain alert to promiscuous risky attachments of the carbon footprint metaphor and its associated metaphor, carbon vitality. As William Connolly warns, vitality in and of itself offers no guarantees:

For some of us, vitality is a capacity to appreciate and cultivate to the extent we can because, first, it enhances our positive sense of attachment to a cosmos that is neither predesigned for us nor that susceptible to our control and, second, it is a gift we can draw sustenance from when new and unexpected situations arise. But...it is an ambiguous gift if the world is not preorganized for us in either of the above two ways...the connection between us and the world is replete with constitutive dissonances and tensions. Vitality expresses those tensions. (2013, 148)

Following up on the tensions and ambiguity of (carbon) vitality, I turn now to the risks presented through the carbon footprint of shrimp contact zone as it mediates connections to marketized approaches to climate change.

The Risky Attachments of Vital Relations to Carbon Markets

The catchy shrimp cocktail estimate is part of the relatively new field in science and economics called *ecosystem services*, which uses models to measure the value to human communities, in economic terms, of forests, grassland, waterways and even the air. (Phys.org 2012)¹⁶³

While the entrance of larger-than-human vital relations through the carbon footprint metaphor promises a re-staging of carbon matter, it also risks the management by humans of life newly named as “having” a carbon footprint. As outlined previously, the shrimp, mangroves and a network of larger-than-human actors are at the heart of reconfiguring the footprint metaphor; the risk identified in the quotation above however, is that almost as soon as newly configured actors are affectively mediated into view, they get constituted within a financialized and humanly-constrained “ecosystem services” approach to managing the sea as it offers the potential to sequester an increasing trajectory of carbon emissions *on behalf of* human societies.

Despite the many possible interactions and their implications for alternative sensibilities latent within the carbon footprint of shrimp story, such considerations are foreclosed upon in a normative monetization of ecosystem services angle in some of the articles that pick up this story. Notably, Boone Kauffman himself institutes this association because his carbon footprint analysis ends with the implication of bringing these costs ‘home’ to the market: “Based on his calculations, Kauffman says that compensating farmers for not growing shrimp would mean that each ton of carbon kept

intact in mangrove soil would cost about \$4.50. ‘That’s well within the range of carbon markets,’ Kauffman said.”¹⁶⁴

The carbon markets to which Kauffman makes reference are those implemented by the Kyoto Protocol’s Clean Development Mechanism, the global trading scheme that came into effect through what David Driesen calls a “shotgun wedding” between the UNFCCC along with other Kyoto Protocol signatory countries and the United States, who promised support of the Protocol on the condition that a flexible neo-liberal trading mechanism be implemented (a promise which was broken as the U.S. did not sign on to the agreement, as mentioned in Chapter One). (Driesen 2008, 34). The appearance of shrimp, mangroves and their “blue” associates here through the footprint metaphor as financialized carbon agents is reminiscent of the mechanisms through which carbon subjects have been brought into a governmental conduct of carbon conduct that ultimately legitimates carbon markets as instruments of economic growth. In this contact zone, the carbon footprint metaphor marks the first stage of recognition of these actors who, on the one hand appear to be newly counted in the politics of climate change. On the other hand, however, if apprehended through a partial human vision even further reduced through a market lens, these actors offer new wealth-creation opportunities in the development of a liberal environmental order. It is not my claim that Boone Kauffman and his colleagues who advocate for an ecosystems services approach to blue carbon are villains who aim to profit from the internalization of these carbon agents into carbon markets. For the purposes of this critical examination of metaphor, however, the ways in which the carbon footprint metaphor functions as a justification for fraught market solutions merits attention.

The affective mediation of the footprint metaphor may be seen as an initial step in the reduction from what Jane Bennett (2010) calls “vibrant matter” to a carbon calculus of species and ecosystems – a reduction that launches an ecosystem services approach to the valuation of the material and cultural element of carbon. Importantly, ‘ecosystem services’ itself is a contested notion/metaphor that has arisen among ecological economists to challenge the principles of *substitutability* within conventional economics. As Dempsey and Robertson suggest, “ecological economists insist on the persistence of environmental externalities which cannot be substituted–for and must be internalized by being explicitly valued” (2012, 5). While the granting of an environmental ‘outside’ to market logic marks a key epistemological break-through for economics, the belated taming of these outside forces within the market through “internalization” also risks institutionalizing a particularly reductive partial human vision as the means of solving a host of complex material-ecological crises.

It is important to recognize the myriad agendas and motivations that shape ecosystem services defined variously “as a standard commodity or as a heuristically useful metaphor” (Dempsey and Robertson 2012, 3). Not all of the approaches signalled by this “services” metaphor gesture at the need to commodify ecosystem actors within markets; in fact, many offer quite the opposite implications (ie. that exploring this metaphor/approach productively highlights how ecosystems can *never* be made into commodities in private financial institutions). “We want to make clear that expressing the value of ecosystem services in monetary units does not mean that they should be treated as private commodities that can be traded in private markets” (Costanza et al 2014, 157). Despite important caveats and nuances, however, what holds many of these theorizations

together, are two premises: first that ecosystems are conceived as providing services *for humans*; and second, that an appropriate and necessary way of evaluating these services is to render them in terms of a universal monetary currency. These two premises guided Costanza et al in their influential estimate of world ecosystems as providing 33 trillion US dollars' worth of ecosystem services in 1997 and in their 2014 up-date which now estimates such ecosystem services at a value of between 124 and 145 trillion dollars (Costanza et al 1997; Costanza et al 2014). Nuances are evident in the debates about the policy and conservation structures and implications of these two premises, but many of the general tensions arise from whether "money's use as a universal equivalent can be separated from the operation of capital to generate profit – a belief among both scientists and policy-makers" (Dempsey and Robertson 2012, 15). This belief, or what Dempsey and Robertson call "blindness" is evident in the discussions of the sequestration power of blue carbon that lend currency to the carbon footprint metaphor in aquacultural practices as they connect to carbon markets. Following this logic, Boone Kauffman suggests that a \$4.50 compensation (according to carbon market value) to fishers for *not* growing shrimp would take care of the problem. As I describe below, however, trading in equivalencies through the commodification of carbon does not provide the easy one-size-fits-all solution that it pretends to.

In this case, the carbon footprint analysis of farmed shrimp invests in an ecosystem services approach to mangroves by apprehending their capacity to store or "sequester" carbon, which then slips into the norms of liberal environmentalism that uphold profit-orientation. The metaphor mediates the apprehension and internalization of those actors whose carbon footprints have yet to be counted, but it does so by removing

biodiverse specificities of carbon vitality. Steve Bouillon suggests that blue carbon coastal ecosystems may “bury carbon at rates up to 50 times higher than those in tropical rainforests” (2011, 282). Through this functional lens, mangroves are valued neither for their inherent myriad relational processes and complex interactions, nor even for how they can instruct humans about how to relate to coastal marine zones (like for the Moken who build permeable temporary stilt houses inspired by the sentient structures of mangroves); rather they are valued for their comparative ability to sequester carbon away from the atmosphere where its accumulating presence spells disaster for the human species (among others who are not equally valued). An initial apprehension of these carbon relations within an ecosystem services approach occurs through scientific instrumentation and data collecting which reveals complexities that were previously unseen and uncounted; this apprehension is also achieved through the carbon footprint metaphor which yokes together these carbon relations. Such carbon complexities, at the initial phase of metaphoric apprehension, can serve as a reminder of partial human vision and gesture toward a perennial need for human humility in composing worlds; however, when apprehended alongside an ecosystem - or more reductively - *carbon* services approach, these complexities are significantly reduced. “In this way, carbon is individuated (separated from its local context) involving a discursive and practical cut into the world in order to name discrete chunks of reality that are deemed socially useful” (Bumpus and Liverman 2008, 136).

This initial stage of carbon reductionism institutes the conditions of possibility for carbon capital (described below), a different form of capture whose logic often defies the assumed climate change mitigation principles that serve as its foundational justification.

As noted above, ecosystems services approaches already twice reduce myriad non-humans: first, by declaring them human service-providers, and then valuing these services in financial terms. Apprehending the “carbon” services permits further reductions of myriad ecosystems – including watershed relations, microbial soil processes, and infinite other lively interactions – to one category of instrumentality indexed enigmatically as ‘carbon.’ When metaphorically associated with other formidable global elements, such as the (carbon) market initiatives that watered down the Kyoto Protocol, this reduced carbon footprint metaphor risks foreclosing upon the vital sensibilities it initially promises. Through the affective filter of what Foucault calls “the permanent economic tribunal for all matters of life” (2008/2004, 247), other meaningful world-shaping attachments take hold. Significantly, for carbon markets to be judged successful thus far, they do not necessarily require proof of emissions reductions at any scale. Even if they do seem to be permitting reductions at one level, such reductions are often achieved by the accounting tricks of “hopping carbon footprints” that foist emissions from one country or region to another with no overall reductions at the global level, as I describe in Chapter Four. The “economic tribunal” for matters of carbon life might then consequentially centre on how successfully carbon footprint metaphors productively foster attachments between “species and speculative currencies” (Shukin 2009, 6).

Carbon Capital

As outlined in Chapters Three and Four, the carbon footprint metaphor has a history of becoming attached to carbon markets through the off-setting of guilt on the part of carbon subjects, or through fostering state-oriented citizenship regimes of fossil fuel

development. This time, through the appearance of ecosystems associated with the carbon footprints of shrimp, new carbon actors appear ambivalently to both displace human primacy in the footprint, but also to become potentially bound within particularly encumbered human orders of ecosystem services. This appearance through certain culturally-coded carbon compounds, allows the conditions of possibility for what Nicole Shukin flags as “animal capital”, “...the paradox of an anthropocentric order of capitalism whose means and effects can be all too posthuman, that is, one that ideologically and materially invests in a world in which species boundaries can be radically crossed (as well as reinscribed) in the genetic and aesthetic pursuit of new markets” (Shukin 2009, 11). This critique tempers an unequivocally promising story of emergence of carbon kin with whom humans share vital relations. If the metaphor of the carbon footprint offers the potential of crossing species boundaries to disturb all-too-human accounts of carbon actors, it also certainly invests, through certain metaphoric associations, in a form of species boundary-crossing that remains anthropocentric by apprehending newly coded carbon actors and species that appear in the service of new carbon markets. The carbon footprint metaphor’s ability to traffic across species lines bolsters this logic of “carbon capital,”¹⁶⁵ an investment in the novel appearance of non-human actors as opportunities for speculative finance in carbon markets. Paradoxically, this logic grants the importance of non-humans in a carbon connected world, but it reinscribes a specific human partial vision through the “universal” equivalent of finance capital, an equivalence that is challenged not only by human specificities and contingencies where global asymmetries prevail, but also most certainly, by non-human vitality in carbon flows.

The jumbo carbon footprint of farmed shrimp mediation makes possible an affective investment in carbon capital whereby mangrove ecosystems function reductively as a standing reserve of carbon not only in their material storage capacity, but through what Michael Betancourt calls a “semiotic exchange of immaterial assets” (2010).¹⁶⁶ Here the amorphous quality of metaphorical carbon distanced from its material flows functions to legitimate the generation of market value through abstraction, assimilation and homogenization; “...once a tonne of reduced carbon becomes a credit, it is largely assumed to mean the same thing as other tonnes of reduced carbon, despite the potentially different material circumstances” (Bumpus and Liverman, 2008, 137). The mediation of associated metaphors further sustains this relation. Under current regimes, putting or keeping carbon in its place – “sequestering” it or storing it in a “sink” – often parallels a transactional accounting of carbon markets as emissions reductions certificates that keep in place patterns both of fossil-fuel intensive wealth generation and of unequal global wealth distribution. In many cases, it makes more sense for state and non-state actors to avoid the high costs of changing their hydrocarbon-intensive practices by investing in other countries’ “cleaner” development. “CDM allows emission reductions to be made more cheaply by investing in other countries. In effect, capital can achieve higher rates of accumulation under carbon trading because it needs to invest less in domestic emissions (Bumpus and Liverman 2008, 142).

Naming a mangrove forest as a carbon sink risks effacing all other complex cartographies of existence and lively social-material interactions within these sentient spaces and relatedly, instituting neo-colonial relations. As Gavin Bridge suggests, this carbon storage logic promotes the “enclosures and transformations necessary to produce

sequestration landscapes as objects of speculation and instruments of profit” (2011, 824). While the blue revolution advancement of jumbo shrimp farms in coastal ecosystems of the Global south enacted an initial dispossession of lively spaces for local communities, the (partial) recovery of this land as carbon sinks risks initiating new forms of colonial dispossession. Building on David Harvey’s critique of capital “accumulation by dispossession,” Bumpus and Liverman call this process “accumulation by decarbonisation” (2008, 142). This process involves the creation of:

...rights to emit carbon (pollution permits)...that become commodified and privatized, traded with transaction fees, and allocated and regulated by international and state institutions under conditions of unequal exchange between developed and developing countries, northern companies and southern communities. (Bumpus and Liverman 2008, 142)

Once the value of the carbon services of mangroves has been apprehended, abstracted and virtualized as a commodity through the CDM, land use is regulated in a way that often amounts to the expulsion of local peoples and their traditional means of subsistence while yielding control to conservation experts from afar. The removal of local peoples “simplifies the mangrove forests in order to make levels of carbon sequestration legible for carbon markets” (Beymer-Farris and Bassett 2011, 333). The process of recovering mangrove forests for their carbon sequestering capacities is often then accomplished through re-planting mangrove trees in coastal ecosystems that have been degraded; mimicking the terrestrial version of carbon sink forest management, which often amounts to monocultural plantings to perform carbon sequestration for the globe, marine plantings apprehended as carbon sinks are similarly prone to being divested of necessary biodiversity (ibid., 339). These monoculture projects planted with newly introduced non-endemic “climate-ready” plant species often wreak havoc on local ecosystems.

Such practices risk utilizing “climate policies to bring about a variation on the traditional means by which the global South is dominated” (Bachram 2004, 6). The “CDM provides the economic incentive to engage in such practices as a cost effective way to generate [Certificates of Emissions Reductions] CERs” (Wilson 2011, 1012). Activists in India have called these carbon services projects “carbon colonialism” belying their *carbon-trumps-all* logic of accumulating carbon sinks and wealth for the Global North at the expense of localized social-ecological economies (Equity Watch 2000).¹⁶⁷ Seemingly apprehending ecological and carbon complexities belatedly, the reductions of carbon vitality through climate policies like those of the Kyoto Protocol reveal the shifty metaphorical work of ‘carbon’ as market and a paradoxically non-human, but still anthropocentric ‘carbon footprint’ that seem to favour the same global beneficiaries as always .

In the carbon calculations initiated by an apprehension of the carbon footprint of farmed shrimp, the footprint metaphor may underwrite schemes that not only dispossess local populations of their land and livelihoods, by paying fishers *not to fish*, but they also leave further ecological degradation in their wake while failing to reduce global emissions and address asymmetrical relations. As Bridge suggests, “[t]he emergence in the global South of land cover regimes managed for their carbon storage or sequestration capacities is paralleled by the proliferation and consolidation of fossil fuel consumption in the global North” (2011,826). Thus far, the results of carbon trading schemes have been antithetical to their emissions-reducing and sustainable development pretensions; on the contrary, carbon markets have perpetuated a trajectory of “uneven development” and “destructive ecological activities” (Bohm et al 2012, 1632).

Although it is not my contention that all who suggest market mechanisms as potential “solutions” to climate change are favouring profits over ecosystem health, the track record of these solutions tellingly exposes a misalignment of priorities when they are systematically implemented. In practice, these projects of locating a carbon footprint as a carbon sink reinforce the “compromise of liberal environmentalism” first established in the 1990s as climate change first came into public visibility (Bernstein 2000). Whereas through the Kyoto Protocol’s Clean Development Mechanism, the carbon trading market achieved immediate financial success, topping at \$ 64 billion in three years (World Bank 2008, 1), the emissions reductions accounts seem far less promising. In a comprehensive assessment in the *Ecology Law Quarterly*, Kylie Wilson reviews a number of CDM hydroelectric projects, forestry projects and biomass and waste projects in developing countries (2001). Her case studies reveal that the UNFCCC approves most of these projects with little oversight, tasking individual host countries with determining the length, breadth and depth of environmental assessment and stakeholder engagement. Because there are real financial incentives to fast-tracking these projects before a project developer potentially chooses to invest in a neighbouring country, and because host countries lack the capacity to do costly environmental and social assessments, “many host countries have conceded that they are not in a position to do more than take for granted the claims made by project developers in project design documents about the expected sustainable benefits of projects” (Wilson 2011, 993). The result is a carbon trading scheme that works to enshrine carbon capital, but does not reduce overall global emissions.

Initial analysis of the unfolding Reduced Emission from Deforestation in Developing Countries (REDD) suite of solutions – the UNFCCC carbon market mechanism aimed at preserving carbon stocks in terrestrial forests – suggests similarly disappointing results. A report by Coren et al in *Climate Policy* suggests that “forest carbon activities tend to deliver fewer credits than calculated *ex ante*” (Coren et al 2011, 1285). The authors therefore suggest that the expectations for biophysical mitigation anticipated by this market instrument be tempered since the financial incentive is not sufficient to promote wide scale protection of forests within international carbon markets. What is more, in the context of cases of mangrove reforestation, REDD “carbon forestry initiatives are redefining socio-natural relations in ways that threaten access to, control and management of natural resources” (Beymer-Farris and Bassett 2011, 339).

In addition to enacting novel forms of environmental colonialism and failing to ensure emissions reductions, carbon capital’s ability to deliver on its own profit-generating logic itself has recently come under scrutiny. CDM credits have earned the “status of the world’s worst performing commodity as slumping demand meets rising supply of the UN instrument traded under the Kyoto Protocol” (Wynn and Chestney 2011). The European Trading System (ETS) is facing collapse due to low carbon pricing and a surplus of allowances.¹⁶⁸ The supposed win-win scenario of ensuring sustainable development for developing (non-Annex I) countries and affordable carbon emissions reductions for developed (Annex I) – anticipated by proponents of the CDM is now looking as if it were a pipe dream. Because it favours instituting a particular partial vision that is especially short-sighted, as David Driesen points out, cheap carbon emissions

reductions will always remain at odds with attempts at “sustainable development” in its pretenses toward the future and intergenerational equity.¹⁶⁹

By offering a critique of the risks of carbon capital as they are smuggled in through the carbon footprint metaphor, I am not suggesting that forms of human currency should be removed from the equation of climate change politics, nor I am insisting that non-humans are categorically separate from market considerations. As the tensions within ecosystems services reveal, what may be called non-human ‘nature’ is certainly imbricated within and affected by what Costanza calls the “real economy” (2006, 749). Further, as William Connolly argues, even critics of capital must avoid the tendency to “treat capitalism as an amazingly self-absorbent system, or reduce economic life to a ‘discursive system’ without thinking closely about its innumerable imbrication with nondiscursive systems with impressive powers of their own” (Connolly 2013, 30). The trick is to “set the stage” to attend to the complexities of “nonhuman force fields” entangled with these systems (ibid., 31). Carbon/ecosystem services approaches in their myriad theoretical and practical manifestations are often attempts to manage these complexities, in some cases, without commodifying these services (Reid et al 2006 749). Notably, prior to the United States’ insistence on the addition of the Article 12 carbon trading scheme to the Kyoto Protocol, there was a strong push from the European Union and other countries to support binding targets and “less use of trading” (Driesen 2008, 34); meanwhile Brazil, along with the rest of the Group of 77 countries pushed for *financial penalties* levied on Annex I parties who exceeded their permitted amount of CO_{2e} emissions (Wilson 2011, 976). Further, many countries use other regulatory mechanisms that combine targets for use of renewable energy with tax incentives and/or

feed-in tariffs for renewable energy providers who contribute to the energy grid (Driesen 2008). The use of some financial mechanisms clearly addresses an important cultural-material entanglement of hydrocarbons and markets in modern human societies that must be reckoned with; however, the particularly trenchant compromise of the global carbon-trading scheme enacted by the Clean Development Mechanism makes use of carbon's shape-shifting metaphoricity to enact carbon capital as *the* going "false solution"¹⁷⁰ to climate change. As Dempsey and Robertson warn, the use of money as a "universal equivalent" becomes notoriously difficult to separate from money as capital and profit-generating in and of itself (2012,15). Tracing carbon footprint metaphors' affective mediations towards profit-generating principles exposes this fraught organization of carbon vitality.

Grasping Towards Carbon Vitality?

The promises that I gesture toward in this chapter relate to the metaphor's openness to the relational forces of larger-than-human footprints. Whereas farmed shrimp could be viewed simply as commodities within global systems, sensing their gargantuan carbon footprint requires situating them within relations and processes that pre-existed their entrance on the scene in discourse. In this case, the mangrove forests and connected ecologies indexed belatedly through the 'blue carbon' metaphor appear as key actors with forces and trajectories that do not operate singularly in the service of human design. Carbon vitality, a novel metaphor, gestures toward this potentially powerful connection with co-present beings – be they human, shrimp or mangroves – at this particular historical juncture of changing climates. I suggest that this is a metaphorically-enabled

affective relation because it enables globally dominant human populations to feel connected to ecosystems that they might not conventionally consider as their own (in the sense of bio-regionally-conceived, human constructs of ecosystems). The affective mediations of the carbon footprint metaphor bring these distant ecosystems into the human and political realm of visibility and speakability as a first step toward perceiving this connection. In the world-making politics of which metaphors are constitutive, carbon footprint metaphors are capable of bringing shrimp and mangroves into more proximal relationality as a profoundly political aesthetic act. In this case, the carbon footprint of shrimp is one example of the broader capacity of this metaphor to open up perceptions to connections that might not have otherwise been sensed. As mentioned at the outset of this chapter, the ‘carbon footprint’ of rainforest beef similarly connects the consumption practices of those in the Global North with a series of profit-oriented cattle-raising practices that degrade socio-ecological systems in the Global South. Whereas climate change often appears as a statistical abstraction and as something only about distant ecosystems with images of melting polar ice caps, and dying polar bears, the carbon footprint metaphor can bring into more proximal visibility the deeply entangled larger-than-human biospherical relations that climate change asks us to perceive. Provided that these relationalities and processes are not rendered in the reduced terms of carbon capital, they offer an alternative politics in which perceptions and worlds may be re(con)figured.

Notably, shifting carbon footprint metaphors influence and are influenced by wider movements of affect that ambivalently foster attachments of all kinds, not all of them promising profound shifts away from the fraught trajectory of carbon capital; however, in their affective attachments to carbon markets, carbon footprint metaphors

may also bring to light the failures of carbon capital to deliver both on its promise of steady wealth generation and real results in terms of emissions reductions. As Patrick Bond suggests, "...the limits of the market for solving climate crises via carbon trading are clearly evident, as demonstrated by the 2011 collapse of the European Emissions Trading Scheme...and the 2010 demise of Chicago's carbon exchange" (2011, 17). Many environmental economists are now acknowledging that one of the risks of the carbon markets is the uncertainty built into the system (Juergens et al 2012; Zhang and Wei 2009). They suggest "the drivers of carbon price change, such as energy price, unexpected weather conditions, institutional information disclosure and so forth" consequentially make these markets extremely volatile (Zhang and Wei 2009, 1808). Perhaps the carbon footprint of shrimp contact zone also suggests a more foundational source of uncertainty in these markets: the larger-than-human carbon connections that emerge to register a shock or disturbance in what has been apprehended thus far in the calculus of footprints. The moving footprint seems always beyond reach, suggesting that a reliable calculus of carbon markets is always elusive, that we should not be surprised that carbon markets do not do as they're told. This instability affirms the not-yetness of affect and suggests a different orientation. This orientation is not easy to describe in normative terms, but as William Connolly suggests, it involves "heightened patterns of sensitivity and experimental shifts in role definition:"

The intuition is that we must simultaneously *slow down* at key points and moments as we enhance sensitivity to the course of things outside our habitual modes of perception, expectation, and security and *speed up* a series of changes in contemporary role definitions, identities, faith, public ethos, state priorities, and economic practices. (2013, 11)

The wager here is that carbon footprint metaphors may foster *enhanced sensitivity to the course of things outside our habitual modes of perception*. Such carbon compounds in their most promising manifestations might at once be understandable in human terms, and be malleable to decisive impingements from larger-than-human relations that reveal something about the way in which worlds are organized and how they could be otherwise. The use of such compounds might risk an organized reduction of all life to carbon presenting a kind of universalism, but these compounds may also orient suspiciousness towards the effects of quantifiable universal equivalencies, interpreted as money, or as rigorous CO₂ equivalents. One of the lessons of the successes and failures of the Kyoto Protocol is that quantifiable numbers can always be manipulated (as can metaphor!). Carbon footprints here reveal the urgency of sensory attunement to the parts that have had no part in a given distribution of the sensible of climate change politics. As Jane Bennett suggests, following Rancière, “a political act not only disrupts, it disrupts in such a way as to change radically what people can ‘see’: it repartitions the sensible; it overthrows the regime of the perceptible” (2010, 107).

These metaphors, if they remain open to larger-than-human vitality enable iterative acts of disruption and inclusion in the politics of climate change. Thus, carbon footprints are integral to what Latour calls an ongoing “composition of the common world” (2004, 247). Notably, for those thinking of ecological politics in these troubled times of planetary ecological crisis, the world is never completely ‘composed’ by the human actors that attempt to politically way-find (Bennett 2010; Connolly 2013; Haraway 2004; Latour 2004; Morton 1013). The parts that have had no part emerge to temper an assumed consensus of citizens or species involved in this political world-

making. This metaphor in its always-contingent closures and remaining openings to the traces of appearing actors offers a crucial mediating role. Following these traces avowedly dismantles the notion that *human* carbon footprints are the singular locus of control for climate change.

In this analysis the ecosystem revealed includes a complex interconnection that is not founded on an either/choice between human and nature; this affective connection exposes the parts that had no part in the original founding of certain practices of the human aquacultural industry. The politics of aquaculture are certainly gaining public notice; where the ocean formerly provided a new frontier of harvest, certain practices – the cultural currency of the moniker of OceanWise on seafood, for example – reveal a novel (through still fraught¹⁷¹) sensibility to these ecosystems. Importantly, changing practices are enabled by a cultural politics that affectively mediates seemingly distant relations and processes into view and/or into more proximally felt relationality. The power of this carbon footprint metaphor contact zone involves its capacity to make visible climate change as a complex ecological matter of concern. Rather than taking climate change as an always-universalising atmospherically-located matter that trumps all others, a matter to be engineered to preserve a certain lifestyle, this contact zone features carbon vitality as implicated in land, water, and culture in all of its diversity; such vital relations demand different responses than those habitual practices that have come to shape the norms of liberal market environmentalism.

CONCLUSION

Fostering Critical Eco-Aesthetic Literacies

“The question is”, said Alice, “whether you can make words [metaphors] mean so many different things.”

“The question is”, said Humpty Dumpty, “which is to be the master – that’s all.”

Exposing the folly of language and its inherent struggle over meanings, Lewis Carroll’s poetics productively up-end the world and its referential mediations. Much is at stake in this up-ending of the word-world relation when it comes to carbon footprint metaphors and their mediating role in cultural politics of climate change. Beyond merely making visible the struggle in which words are embroiled, as does Carroll, however, I wish to challenge the sense of (human) mastery in the last instance implicit within Humpty Dumpty’s response to Alice above. My insertion of “metaphors” in the above quotation serves as a further irritant to the notion of mastery in human language; it is this troubling force that makes metaphor politically and ecologically powerful and serves as the locus for what I elaborate as an urgent agenda of fostering critical eco-aesthetic literacies in the cultural politics of climate change.

As the previous analysis reveals, no definitive meaning emerges out of the discourses of carbon footprint metaphors. The recognition of multiple meanings or interpretations of these metaphors should not lead to completely abandoning efforts to explore effects of these multiplicities and the struggles in which they are entangled. Rather than slipping into triteness or oblivion, carbon footprint metaphors seem to be constantly deployed in novel ways, both because of their unique quantitative pretensions that can never be fulfilled and because of their metaphoric capacity to shift and account for new relations and processes that are central to the cultural politics of climate change.

Always alluding to or stepping toward the (im)possibility of an “all-in” measurement of carbon quantities inherent to everybody and everything, carbon footprint metaphors gesture at the limits of human capabilities of apprehending all of the complex associations and processes that are involved in worldly carbon relations. This does not, however, make metaphors irrelevant; by very virtue of their metaphoricity, carbon footprint metaphors are involved in a process of “recharging” that situates them within an unfolding cultural and material history. Just as global societies are waking up to forms of connection through an apprehension of climate change and to their relative roles in causing this phenomenon, new actors are emerging to demand accounts through footprints. As Timothy Morton proposes, a “nascent ecological awareness” that contemporary urgent crises like climate change requires, profoundly reveals that “humans are not totally in charge of assigning significance and value to events that can be statistically measured” (2013, 16). Each footprint metaphor can offer, in itself, a kind of re-distribution of the sensible of the norms conventionalized in previous accounts of the footprint by iteratively bringing into view newly apprehended actors (with all the promises and risks associated with apprehension, read doubly as ‘understanding’ and as a form of ‘capture’ or ‘sequestration’).

The way these metaphors have shifted historically over the years since their emergence is suggestive of their role in shifting carbon consciousness, material ecologies and politics in a time of climate change, and also of their ability to iteratively take in more of these actors as they potentially trouble a sense of human mastery in constituting carbon relations. Whereas when carbon footprint metaphors first emerged, they appear to have played a large role in hailing carbon subjects through the use of ‘you’ and the lists

that predominated to orient certain behaviors and actions of individual human carbon subjects, they now less often call ‘you’ and more often gesture towards non-humans, and acts that implicate carbon relations and processes. If the move from “your” carbon footprint to the carbon footprint of bananas and other consumable ‘things’ indexes a subtle shift away from the centrality of individualized carbon subjects toward other worldly carbon connections, then the stories and practices initiated by Kauffman’s analysis of farmed shrimp in lively mangrove ecosystems suggest yet another turn in this footprint’s history. That is not to say that individual consuming carbon subjects are no longer implicated in the carbon footprint of farmed shrimp story; they most emphatically are. One could easily present this latter instance of the footprint as singularly continuous with the consumer-oriented logic of the carbon subject and carbon markets; yet this subtle historical shift in the affective mediations of carbon footprints merits more nuanced attention for what it offers. The footprint in this story traces carbon histories that are still unfolding.

Although the move from making visible “what *you* do has carbon implications” to a politics that senses ecologies as they might be connected through carbon vitality, may seem an insignificant shift, this move emphasizes that at this critical juncture, human language and metaphors can (and need to) be written “back into the land [and sea]” (Abram 1996, 273). I do not mean to evoke some nostalgic return to language and human society as it was in the past; rather, I suggest that present conditions of climate change and other ecological crises call for our linguistic mediators of entangled relations between ‘nature’ and ‘culture’ to be recognized for their pivotal mediating role. At their most promising, carbon footprint metaphors outline the contours of larger than human

perceptions, thereby challenging their prescribed roles within a normative distribution of the sensible in the cultural politics of climate change which reinforces the market growth imperative of liberal environmentalism.

Notably, however, apprehending the carbon footprint of jumbo farmed shrimp via its situatedness in mangrove ecosystems also risks reinscribing certain anthropocentric “solutions” where the larger-than-human connections are lost as normative human sensibilities are reinscribed. This risk is often further bolstered through the carbon footprint metaphor’s affinity with the metaphor of “life cycle analysis” whose humanistic bias is more strongly evident in the associated “cradle-to-grave” metaphor.¹⁷² These metaphors, based on humanistic notions of biographies of ‘life’ risk grasping only infinitesimally small slices or points within the planetary life of carbon. The metaphoric moment registers a kind of principal of entrance into human political visibility, but through what lines of sight and how do these influence how it is rendered and acted upon? Does the way in which carbon – which I take here at times (self-reflectively) itself as a metaphor for ‘connectedness’ since all Earthly life forms are carboniferous – has already been institutionalized foreclose upon any interventions through this metaphorical-material element? How are we to reconcile the divergent impulses registered through carbon footprint metaphors, and more importantly, how can we situate the role of these metaphors in generating political and ecological interventions?

I propose that the previous analysis of carbon footprint metaphors sets in motion an agenda for developing what I call “critical eco-aesthetic literacies.” Critical eco-aesthetic literacies offer a means through which to negotiate the paradoxes and complexities of the Anthropocene, where human mediations (including language) are

recognized for their world-creating force, yet these same human mediations are simultaneously challenged by larger than human agency. The contours of this suggestive agenda involve first, asserting a pivotal role for sensing with ecological metaphor, which proceeds through a tentative, cautious engagement with anthropomorphism, then finally, elaborating how such moves can contribute to composing (carbon) confederacies through the cultural politics of climate change.

Sensing with Ecological Metaphor

A critical eco-aesthetic literacy does not involve ‘reading’ nature, but rather sensing with ecological metaphor as an explicit site of aesthetics in which worlds are composed.

Literacy begins ironically here by situating human language as utterly imperfect, incapable of definitively representing in a manner that is faithful to some originary essence; but it proceeds through centrally figuring the most explicitly non-representational form of language: the metaphor. As poet Don McKay suggests, “one metaphor for the excitement of metaphors is to say that they are entry points where wilderness re-invades language, the place where words put their authority at risk, implicitly confessing their inadequacy to the task of representing the world” (McKay 2002, 71). Although the notion of ‘wilderness’ may be problematic (as a metaphor that gestures toward an impossible ‘outside’ of human involvement),¹⁷³ McKay’s gesture remains an important one. Metaphor denies the quest for mastery within human representational systems through putting at risk the authority of words. There exists a charged force to metaphor, what McKay calls the “energy” associated with the “sheer muscle required to speak a lie in the interests of truth, and leap between two distant regions of experience” (61). To put words’ authority at risk therefore means enabling a

certain opening, a constant questioning stance vis-à-vis human apprehension: *Can ‘we’ call ‘It’(x) that (y), and if so, what ‘truths’ or realities are ‘we’ creating through the lies of yoking together unlikely entities?* Further, *once a metaphor emerges, how does it shift and what associations does it carry with it?* These are profoundly political questions that reveal the constant work of creating worlds that a politics of aesthetics brings to visibility. Such questions that have driven my analysis of carbon footprint metaphors highlight that a first principle of critical eco-aesthetic literacies begins by suspending the ‘literal’ authority of language and returning metaphoricity. While there may be a certain reticence involved in closing down the authority of human language,¹⁷⁴ the openings facilitated through such a move are deeply generative. This critical component of eco-aesthetic literacies suggests that as crucial mediators of urgent contemporary crises, ecological metaphors may be subject to the kinds of discursive analysis that I have initiated here for the carbon footprint. Such a move is especially important for metaphors that, in the words of Paul de Man, “appear to disappear” (1978 18). The metaphoricity of carbon footprints has largely disappeared from view as carbon footprints have become conventionalized and have achieved authority as quantifiers. As metaphor begins by putting words’ authority at risk and thereby troubling the perceptions that are built within language, returning metaphoricity to these entities is key to challenging normative distributions of the sensible built into language.

Highlighting the limits of formal language systems, David Abram attributes such limits to the ways in which formal phonetic alphabets have reified the “linguistic-perceptual boundary,” thereby prohibiting actors that lie beyond that boundary from informing sentient communication (1997, 256). Abram’s response, however, is not to

abandon language altogether; rather, he argues for a kind of re-animation of language in new ways through moments of “magic” that lead outside of uniquely-human perception. Peoples whose “languages are more like permeable membranes binding the peoples to their particular terrains, rather than barriers,” Abram suggests, acknowledge language as “as a margin of danger and magic, a place where the more-than-human worlds must be continually negotiated” (ibid., 256).¹⁷⁵ Magic, for Abram is only possible in reaching beyond a self-referential human world; it occurs through a “spell of the sensuous” where larger than human passageways breathe life into reciprocal communications. The air itself is the common medium that connects reciprocal communication through respiration for Abram. Human utterances depend on the respiratory movement of air, which is itself a composition of elements (and histories of living creatures) whose present-day calibration favours our species and planetary co-species. From this angle, even what seems like a circuit of human-to-human speech is exposed as utterly dependent upon an ecological materiality that transcends the human body in space and time. These utterances then may yet yield to the magic of more than human sensibilities, *if* a certain orientation is enabled. To think of language as a “magical” place where the non-human can register seems to require a leap beyond the normative ways in which human language “properly” refers to things it indexes through this language. Ecological metaphor, however, as a mediator of these sensibilities that challenge the authority of words as self-referential, is one specific site where this “magic” can occur.

The energy of metaphors has long been recognized as quasi-magical in a way that resonates with Abram’s description of the potential magic of porous language. Words like “epiphany” are often used when the ‘right’ metaphor emerges. Epiphany itself is a

metaphor (used equally in religious and scientific settings) that signals a bringing into appearance or making manifest of something that is transcendent or is gleaned from perceptual insight. In an uncharacteristically poetic moment, William Rees, who coined the metaphor of the “ecological footprint,” calls his metaphorical moment an epiphany (2008). A new ‘truth’ was established when the ecological footprint appeared to displace the “regional capsule” concept/metaphor that Rees was working on as an inverted index of carrying capacity; rather than asking *how many people on a given piece of land?*, the question became *how much land (imported from distant ‘elsewheres’) needed for a given population?* (Rees 1992, 125). But, as mentioned in Chapter One, the true metaphorical epiphany occurred for Rees when a new desk-top computer, one with a smaller “footprint,” was brought to his office. This “moment” of the emergence of the metaphor might more aptly be called a magical “quickenings” of a number of moments (and actors) for Rees because he connects this moment to a moment from his childhood on his grandparents’ farm, and a number of other moments which included the participation of a great deal of non-human actors.¹⁷⁶ In his talk “Epiphany, Serendipity and the Genesis of the Ecological Footprint” (2008), Rees connects all of these actors and events together within his (and Mathis Wackernagel’s)¹⁷⁷ metaphorical re-shaping of the notion of carrying capacity and its inverse, the “regional capsule” index. Notably, “carrying capacity” is also a shifty metaphor gesturing at how many of a given species (population) a certain area of land can support (does land really “carry”?), as is “regional capsule”, which evokes an image of a dome over a city.¹⁷⁸ As the wide-spread global up-take of the ecological footprint analysis demonstrates, however, the footprint metaphor certainly gained more traction as an evocative image and political-ecological space (for legacy,

messes left behind, etc, as suggested in Chapter One) than might have been permitted by “regional capsule index.” The ecological footprint analysis retains a certain allegiance to the notion of carrying capacity since an ecological footprint is measured in terms of numbers of “Earths” necessary to retain a certain lifestyle. To measure a footprint by numbers of Earths is, however, in the realm of what McKay suggests as speaking a “lie in the interests of truths” since a huge leap is required between a footprint and Earth (not to mention Earths in the plural as a metaphor for “overshoot” of carrying capacity); nonetheless, the metaphor still resonates despite/because of this literal ‘lie.’ The on-going development of the ecological footprint index/metaphor reveals a kind of iterative emergence of further ‘truths’ through the demands for inclusion of new actors in the index/metaphor. What the founders of the ecological footprint accounting index miss by subsequently disavowing its metaphoricity,¹⁷⁹ as do critics who insist on its failure to provide a “static measure” (Fiala 2008, 6), is that the very metaphoricity of the ecological footprint allows it to remain open to both emergent actors and to the critique that shapes and informs its subsequent elaborations. While the index left out certain ecological relations within “open oceans,” for example, in its first iterations and was therefore subject to critique, ecological footprinting is being shaped by such critiques as they bring new actors and relations into the account (Venetoulis and Talberth 2008, 441). Ecological footprint analysis has also shifted to specific place-based accounts that trouble its universalizing pretensions as a global indicator (Pereira and Ortega 2012). Like the ecological footprint metaphor – a metaphor and an index – the carbon footprint may be animated in the moments of metaphorical ‘magic’ in which the authority of human words

and self-referential systems are suspended and an opening to the porous larger-than-human world of communications is enabled.

With Abram, I suggest that the magic of language comes in part from a spark of connection to a world that is beyond 'our' grasp. Metaphor exemplifies such an aspirational connection, a reach that exceeds its grasp. Ecological metaphor in particular reveals that this spark may come about through an attunement to resonances that are larger-than-human, but still recognizable to humans. One way this attunement occurs is through certain forms of human *identifying* with non-humans, even as fraught as such endeavors might be. Once again, the carbon footprint metaphor serves as a rhetorical example of such an endeavour.

Tentative anthropomorphisms of non-human actors with footprints

Footprints have always held the potential to connect to non-humans since 'we' share the attribute of feet/footprint-making appendages with many non-human animals. At first glance, the carbon footprint metaphor has, since its early days, tended to feature a bipedal human creature's impact, though more recent instances are shifting the focus.

According to the shrimp a carbon footprint, on the one hand seems to anthropomorphically shift responsibility for carbon impacts to non-humans and perhaps problematically remove certain forms of human responsibility. Paradoxically, however, conceiving of shrimp with carbon footprints might also permit 'us' to see a resemblance and to sense carbon vitality with entities other than ourselves. The instances of 'carbon footprints' of non-humans notably, and problematically begin with accounts of animal-as-protein for human consumption (rainforest beef, farmed shrimp), but in doing so they begin to bring into political visibility ecosystems and practices in ways that foster consequential societal

shifts.¹⁸⁰ Other accounts have been occupied with the carbon footprints of dogs and other domesticated animals, compelling attention to, among other things, the impacts of pet food production practices (Rahner, 2009).

Still another fascinating recent case draws into visibility the “carbon footprint of insects” – especially pine bark beetles, whose numbers and practices in recent years have dramatically shifted carbon cycles in western Canadian forests (Ara, 2013; Hunter 2010). Whereas trees in British Columbia were once regarded as ‘carbon sinks’ promising to stand as central allies, helping to achieve climate change mitigation goals, the presence of bark beetles has transformed forests into net *producers* of greenhouse gas emissions as a result of the wood decay brought on by the beetles. According to one popular source, in the year 2009 the carbon “footprint of the beetle-killed wood in B.C. was 74 megatonnes of CO₂ equivalent. The oil sands next door generated 38 megatonnes” (Hunter 2010). The surprising carbon footprint of/caused by these beetles reveals a distributed set of force-relations at work in this carbon footprint. On the one hand, such cases of the carbon footprint metaphor seem to remain anthropocentric because they highlight *human* disruption of ecosystems. Even the case of the carbon footprint of pine bark beetles seems to implicate humans as the agents of warming weather that prevents winter die-off of these insects such that they can increase in population and range, thereby damaging increasing numbers of trees. Arguably, however, this is what the carbon footprint metaphor is meant to do; that is to centrally figure disruptive human impacts on the climate, as humans are the geological forces signalled by *anthropogenic* climate change. What is more, I contend that such instances signal the paradoxes of understanding *human* force relations that cause climate change as they are necessarily entangled with larger-

than-human associations and force-relations. A qualitative shift has accompanied these recent cultural cases of carbon footprints (beef, shrimp, insects) when taken from the perspective of what they bring into visibility compared to when these metaphors first appeared in the carbon-subject producing lists. Although the latest iterations still point to human responsibility for impacts, they do so by way of revealing new forms of ecological embeddedness that connect ‘us’ to actors other than ‘ourselves’ and ‘our’ own self-referential technologies and systems. In other words, these carbon footprint metaphors are capable of drafting maps of the visible beyond the regimes of a household economy where one can buy an electric leaf-blower instead of a gas-powered one. Such recent cases reveal a host of other actions and implicate a complex range of behaviors and systems that could not be contained within a politics of carbon offsets.

These more recent cases of carbon footprints do this work, I argue, in a way that is not *anthropocentric*, but is rather to a certain extent, *anthropomorphic* in that these instances transpose what began as a human footprint written in the carbon footprint metaphor, into an arena of larger-than-human connections. As Jane Bennett contends, anthropomorphism may not be the unequivocal enemy to ecology that it appears to be at first glance because it can function to bring into visibility a shared connection that is not normally perceived:

In vital materialism, an anthropomorphic element in perception can uncover a whole world of resonances and resemblances – sounds and sights that echo and bounce far more than would be possible were the universe to have a hierarchical structure. We at first may see only a world in our own image, but what appears next is a swarm of “talented” and vibrant materialities (including the seeing self). (Bennett, 99)

In other words, as Bennett reveals, by looking first for human likeness in non-human nature, ‘we’ may see beyond in ways that temper the usual hierarchies, taxonomies and

anthropocentrism. The carbon footprint metaphor, as a moving ecological metaphor that first featured human footprints but has also shifted to include non-humans, potentially offers such openings which demand that we see carbon connections and processes that “echo and bounce” well beyond human timelines and human economies.

As I have demonstrated in my analysis of the carbon footprint of shrimp, and as Nicole Shukin carefully reveals in her biopolitical critique of “animal capital” (2009), anthropomorphizing can support a variety of problematic agendas, including human profit generation. Ethologist Frans de Waal (1997) similarly warns that not all forms of anthropomorphism are equally acceptable;¹⁸¹ yet he also warns of the opposite of anthropomorphism, what he calls “anthropodenial: a blindness to the humanlike characteristics of other animals, or the animal-like characteristics of ourselves” (ibid.). Attention to this blindness (even if it is indexed somewhat awkwardly by the word “anthropodenial”) reveals that certain prohibitions against seeing likeness/connections across species risk reifying the very species divides that consequently distance ‘the human’ from non-human others. To proceed cautiously with what Bennett calls a “touch” of anthropomorphism, therefore offers a potential politics of “confederation” that explicitly connects these vibrant materialities:

A touch of anthropomorphism, then, can catalyze a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects) but with variously composed materialities that form *confederations*. In revealing similarities across categorical divides and lighting up structural parallels between material forms in “nature” and those in “culture”, anthropomorphisms can reveal isomorphisms. (Bennett 2010, 99, emphasis added)

I will pick up on Bennett’s generative notion of confederacies below, but first I will trace the potential in the movement she suggests from *anthropomorphism* to *isomorphism*. I

am following Bennett's suggestion of isomorphism in a way that might draw critique from a biologist, but as biologist-metaphorician, Donna Haraway suggests, biology is *built on* metaphors (2004, 146), so I further pursue the poetic licence that Bennett takes with this term. Carbon footprint metaphors can, through the kinds of anthropomorphism hinted at above, reveal isomorphisms as converging relations of kinship. Looking for isomorphisms as a political endeavour should not amount to finding or making equivalencies among all things in nature. One must be cautious to avoid the pitfalls of theorizing actors as structurally the same despite their embeddedness within different power dynamics. As Jane Bennett suggests "to acknowledge nonhuman materialities as participants in a political ecology is not to claim that everything is always a participant, or that all participants are alike...[non human actors] have different types and degrees of power, just as different persons have different types and degrees of power"(2010, 108-109). Such a caveat is especially important in relation to carbon footprint metaphors; there are very important reasons for understanding the different characteristics of footprint makers – both in accounts of intra-human global asymmetries (as demonstrated in Chapter Three) and accounts across species lines. Thus, suggesting that all of us are on equal footing in this carbon footprint is not the goal; yet the first move to establish connection through the anthropomorphism of situating non-humans within the carbon footprint metaphor might permit accounts of connected historical and ecological trajectories that structure contingent and shared relations at the contemporary moment. "Surely the scope of democratization can be broadened to acknowledge more nonhumans in more ways, in something like the ways in which we have come to hear the political voices of other humans formerly on the outs" (Bennett 2010, 109). If one takes seriously

the present moment as the “sixth great extinction event” (Flannery 2005, 182-83) in the life of the planet, then one can see the value of attempting to locate connections among those with whom ‘we’ share a common trajectory. Isomorphism here then, indicates a shared trajectory of co-species who are connected through planetary conditions, including complex carbon relations and processes, and whose fates are therefore intimately connected at a time of changing climates.

This movement from anthropomorphism to isomorphism might begin by finding human likeness in the non-human through metaphorical yoking, and then shift to thinking about how ‘we’ are structured (contingently, historically and materially) by actors that are larger than human and ‘our’ complex interactions with them, just as these actors are reciprocally structured by ‘us.’ Carbon footprint metaphors, *if they are recognized as mediators of this movement*, are a key locus of this politics.

Composing (Carbon) Confederacies

Crucially, Bennett in the above quotation suggests “confederations” of lively materialities. The notion of confederacies is a generative one in this elaboration as it challenges the limits of political terms and institutions that conventionally exclude ecological actors (even in Jacques Rancière’s thought, which I have used extensively). I propose that carbon footprint metaphors offer the potential of bringing “carbon confederacies” into visibility. Carbon confederacies signal a politics of relationality whose complete membership is beyond our human apprehension, despite our best efforts. Confederacy in general terms suggests a political association between states, which entails some deliberate form of instituting loose relations. Rather than following these state and peopled notions of confederacy, I am following Jane Bennett and Donna

Haraway - especially through Haraway's suggestive use of "obligatory confederacy" as it gestures toward material-ecological and political arrangements as they may be encoded in the texts given through what she calls the "rich field of metaphors" (2004, 146) of biology:

Consider then, the text given us by the existence, in the hindgut of a modern Australian termite, of the creature named *Mixotricha paradoxa*, a mixed-up, paradoxical, microscopic bit of "hair" (trichos). This little filamentous creature makes a mockery of the notion of the bounded, defended, singular self out to protect its genetic investments. The problem our text presents is simple: what constitutes *M. paradoxa*? Where does the protist stop and somebody else start...*M. paradoxa* is a nucleated microbe with several distinct internal and external prokaryotic symbionts, including two kinds of motile spirochetes, which live in various degrees of structural and functional integration. All the associated creatures live in a kind of ***obligatory confederacy***. (2004,146 Emphasis added)

If, in the movements between anthropomorphism and isomorphism, certain species divides contingently disappear to reveal alliances that are not yet captured by taxonomies, then this story of *m. paradoxa* is instructive. What this creature-alliance (including the very metaphor of its name!) helps to make visible is that we human animals who often appear to be in charge of confederacies in our own stories, are simply not in charge; we cannot apprehend all of the obligatory confederacies that challenge our categories and taxonomies. Similarly, the boundaries of individualized "footprints" and bodies, be they subjects, nation states, shrimps or mangroves are not so easily determined; we are rather *obligatory carbon confederacies*. This is not confederacy as a romanticized political foundation story of fore-fathers claiming to build all-inclusive nation-states out of a discursively de-populated *terra nullius*, but rather feminist- inspired confederacies as stories of belated inclusion of multiple ecological actors by dominant modern societies. Such obligatory carbon confederacies are just recently coming into view for global

society; carbon footprint metaphors are key to establishing these connections. These metaphors reveal that, on the one hand, obligatory carbon confederacies are always already there without human recognition; but on the other hand, if these confederacies are not built into human political institutions and expressly recognized, they do not register in these institutions as agents with whom we can, in the words of Haraway “strike up conversation” (ibid., 147). The scale of human geological agency in the Anthropocene demands that we attempt to strike up conversation and compose these confederacies more explicitly in our politics. Simply because these non-human actors are there, does not necessarily make it easy for them to be explicitly included in political institutions whose terms conventionally exclude such actors. I suggest that a politics of aesthetics involves explicitly composing these confederacies through institutionalizing a kind of on-going sensing, or attunement through which carbon footprint metaphors play a crucial mediating role.

Bruno Latour’s notion of a “progressive composition of the common world” (2004, 247) contributes some conceptual frames for thinking about how political institutions might shift towards a politics of iterative inclusions of actors. Although as noted in Chapter Two, Latour grants no role for a politics of aesthetics involving metaphors, he does reveal similar moves of anthropomorphisms-isopomorphisms in his gestures of convoking a larger-than-human collective. The common world, for Latour “is not established at the outset but must be collected little by little.” (*Ibid*, 247) While the term ‘progressive’ requires attention for how it might reify the modernist perspectives that Latour himself critiques – as a pretense of a linear overcoming of the material world that has never obtained among so-called “moderns” (Latour 1993) – “progressive” is

meant to gesture at an always unfinished but aspirational movement of taking into account. There is a ‘not-yetness’ involved in this movement that carbon footprint metaphors, in their perpetual shifts exemplify. As Latour insists, political actors emerge in moments of surprise as they come to challenge a given political constitution. This aspect of Latour’s thought resonates with Rancière’s notion of distribution of the sensible and with what I am suggesting here as confederacies. When ecological metaphors are explicitly brought in to supplement Latour’s political process, they can be seen as a profoundly political addition to what he calls a “politics of nature” (2004).

Against the current practice of separating facts from values, Latour proposes an alternative set of considerations/guiding principles for political process in ecological matters of concern. The first consideration within any politics of nature for Latour involves *taking into account*. As a metaphor and set of accounting principles, the carbon footprint metaphor might animate these processes in important ways. *Taking into account* does not assume an equivalence or consensus exists among actors involved within an issue, but the process does open out to those that share a common interest in an account. Such a process involves striking up a conversation with those who may not be our usual interlocutors in given political institutions:

To use the notion of discussion while limiting it to humans alone, without noticing that there are millions of subtle mechanisms capable of adding voices to the chorus would be to deprive us of the formidable power of the sciences. Half of public life is found in laboratories; that is where we have to look for it. (2004, 69)

Problematically Latour’s lifetime of work in scientific labs lends to his emphasis upon a certain democracy of ‘things’ that goes on in these labs where lab rats, funding applications, microbes and certain humans are all actors/”actants” in a network (Latour

1987). While this perspective certainly reveals the power of the sciences as a site/process through which non-human agency ‘speaks’ (sometimes through coercion!), I insist that ecological metaphors such as carbon footprint metaphors are also “public” sites/processes through which voices may be added. His reification of the conventional lab and disavowal of a politics of aesthetics aside, Latour nonetheless offers key insights that are sympathetic with the role of ecological metaphors I have been elaborating.

For Latour, the question of “who is speaking (for)” applies equally to human and non-human actors, so one can (and must) maintain a certain suspicious stance towards “spokespeople” (even scientists) who often tend to shut down the “noisy chatter” of deliberative politics in society by imposing the authority to speak on behalf of a “mute” nature (2004, 14-15). Too often the mediations of dominant *spokespeople* are removed from visibility with political consequences for both humans and non-humans alike:

Speech is not a self-evident phenomenon that properly belongs to humans... The speech of all spokespersons becomes an enigma, a gamut of positions running from the most complete doubt – which is called artifact or treason, subjectivity or betrayal – to the most total confidence – which is called accuracy or faithfulness, objectivity or unity... That a human should speak in the name of several others is as great a mystery as the one in which a human speaks in such a way that he (SIC) is no longer speaking at all; instead the facts are speaking for themselves through him. (2004,70)

A tentative anthropomorphism here brought in by extending the notion of speech to the non-human, leads *not* to the recognition of the impossibility of non-human speech, but to an isomorphic recognition of the difficulty of *even* human speech as a shared enigma of articulating a common world. A fidelity to unmediated facts ascertained by a given authority is granted to no singular agent, be it human or non. “Speaking” as a political act of representation is not an unmediated fact built into human species but involves *speech impedimenta* – “not the speech itself but the difficulties one has in speaking and the

devices one needs for the articulation of the common world” (Latour 2004, 249). As my analysis of carbon footprint metaphors reveals, such ecological metaphors can play the roles of both pointing out the difficulty of articulating the common (carbon-composed) world *and* helping to mediate and articulate these entanglements. Thus, composing carbon confederacies might begin by situating carbon footprint metaphors within this agenda of critical eco-aesthetic literacies where speech and sentience are expressly distributed.

For Latour, a constitution (the process I am calling composing carbon confederacies) is based on a distribution of forms of speech through an institution. Such an institution has yet to be constituted for Latour. Against Latour’s overdetermined institutional logic, however, Rancière offers a different politics of aesthetics which is more suggestive of a role for ecological metaphor: “The difference does not arise from a set of institutions but consists in another distribution of the sensible, another setting of the stage, in producing different relations between words, the kinds of things that they designate and the kinds of practices they empower” (2010, 54).

I am suggesting that the carbon footprint metaphor might be considered one kind of another aesthetic distribution of the sensible that fosters tentative openings and closings through its quantitative-qualitative interplay. As my analysis reveals, where these footprints become “grounded” matters as far as the impressions they make in composing confederacies. Even though carbon footprints cannot be definitively tracked, their traces are still capable of orienting these politics. Here the universalizing tendencies of *the* carbon footprint metaphor as a quantifier bear attention for how these reify normative distributions of the sensible and leave problematic systems intact. Carbon

footprint metaphors in their specificity remind us that the universalizing metric has left out key actors who emerge to claim a place in the account, thus they reveal the universal to be “an aspiration, an always unfinished achievement, rather than the confirmation of a pre-formed law” (Tsing 2005, 7). *The carbon footprint metaphor might best be thought of as what Tsing calls an “engaged universal” (Tsing 2008, 8). “Engaged universals travel across difference and are charged and changed by their travels. Through friction, universals become practically effective. Yet they can never fulfil their promises of universality” (ibid.). The movement or “friction” between the particular and the universal such that both these scales are affected, implicates carbon footprint metaphors as critical way-finding mediators that offer the capacity to open out towards a politics of iterative inclusions. The cultural politics of climate change themselves operate in these frictions where climate change must be recognized both as a universalizing planetary issue that binds us all and as a set of particular differentially-composed effects and responsibilities (there is not we, yet there is nothing but we).*

To return the carbon footprint to its metaphoricity is to insist on the on-going and shifting struggles of human understandings in larger-than-human relationality, and the politics that are central to the issue of climate change. While relations and processes indexed through carbon footprint metaphors often appear notoriously abstract such that they could easily be sequestered to legitimate an attempt at a totalizing human off-set economy, lively carbon material relations and processes also persistently emerge through the footprint metaphor. Rather than bemoan this metaphoric openness, however, it may rather be more generative to explore these metaphoric gestures of recomposing sensibilities through the carbon footprint. By bringing into a field of vision larger-than-

human kin relations, these metaphors suggest a politics of commonly constituting these relations as they emerge.

Whereas the carbon footprint has been elaborated almost exclusively as a tool/metric that might foster a politics of *mitigation* against worsening climate impacts, this metaphor also reveals itself to be a site that traces unexpected interactions in shifting ecosystems such that adaptation and mitigation need to be simultaneously thought. Attempts to get the quantifying metrics “right” are inevitably subject to shifting carbon cycles that often frustrate mitigation efforts. Just as ‘we’ think the forests of British Columbia are going to perform a certain amount of carbon sequestration, the pine bark beetle “speaks back” through the carbon footprint metaphor to suggest that all calculations are off. Following the discursive trail left from the article on the carbon footprint of insects leads to the research of Yale Ecology professor, Oliver Schmitz, who suggests, “an unprecedented loss of trees triggered by the pine beetle outbreak in western North America has decreased the net carbon balance on a scale comparable to British Columbia's current fossil fuel emissions.” (Graham Richards, 2013). This carbon footprint trail thus starkly reminds of the enmeshed human and non-human agencies that trouble quantitative accounts and even future-oriented planning of reduction targets; if scenario-planning and targets are based on reductions of emissions from human-specific sources, but do not (indeed *cannot* in a quantifiable sense) take into account complex ecosystem interactions and unknown variables, then such scenarios and targets cannot lead to the kinds of outcomes that they pretend to. This is not to argue for the off-loading of responsibility for unforeseen emissions onto the pine bark beetle, but to make the case that our belated apprehension of this beetle’s carbon footprint (as an entangled function

of human-induced warming) compels a re-orientation of a politics that anticipates as yet unknown contributions to carbon emissions. To engage the distributed power of carbon footprint metaphors is to keep these metaphors alive to these animate interactions. Sensibility to these relations suggest that instead of asking non-human agents to do the work of mitigation on our behalf as we carry on with 'business-as-usual' carbon emissions, *we might re-orient ourselves to more responsible and responsive mitigation efforts away from anthropocentric and asymmetrical growth scenarios.*

There are many pitfalls to be avoided in composing carbon confederacies (neo-colonialism primary among them), but in ecological matters there must be a time to make decisions about our common world. An absence of political institutions capable of grappling with these issues does not entail an absence of decisive political and ecological effects. Many will argue under the powerful banner of 'urgency' that we do not have time for the iterative act of composing confederacies with the help of ecological metaphor; however, I contend that we need to slow down to avoid the very deadlock which now defines political (in)action on climate change.

When constituting these confederacies, the role of affect and sensory registers is paramount. I have only begun to hint at such affective economies in my analysis through the notions of carbon guilt, fellow feeling and carbon vitality; to feel with non-human actors suggests perceptual capacities that are signalled not only through uniquely-human feelings but are connected through what Abrams calls "synaesthetic associations" as the "intertwining of earthly place with linguistic memory" (1996, 176). As Abram suggests in learning from Australian aboriginal Dreamtime stories if one "walk[s] through a material landscape whose every feature [is] already resonant with speech and song"

(177), one's senses are open to larger-than-human sensibilities. The sentience of non-human actors also appears more readily in a way that troubles the division of senses and emotions that depends on a species divide.¹⁸²

Listening to/for larger than human actors is key, so a sketch of fostering critical eco-aesthetic literacies also relatedly suggests that a hierarchy of speaking and listening in politics must be overturned. Rancière's thought is helpful in this regard:

Why assimilate listening to passivity, unless through the prejudice that speech is the opposite of action? These oppositions – viewing/knowing, appearance/reality, activity/passivity – are quite different from logical oppositions between clearly defined terms. They specifically define a distribution of the sensible, an *a priori* distribution of the positions and capacities and incapacities attached to these positions. They are embodied allegories of inequality. (2009, 12)

An activated sense of listening enables attention to the parts who have had no part in a politics of aesthetics. Ecological metaphor does not awaken us to a moment of human ingenuity that will move us to novel future solutions for ecological crisis; it compels us to listen to others who are simultaneously present and yet explicitly absent from politics:

A genuinely ecological approach does not work to attain a mentally envisioned future, but strives to enter, ever more deeply, into the sensorial present. It strives to become ever more awake to the other lives, the other forms of sentience and sensibility that surround us in the open field of the present moment. (Abram, 272)

As a potentially disruptive force that cracks open the codes of human knowing through language, ecological metaphor might help us develop new forms of literacy where what Abram calls the “earthly intelligence of our words” (1996, 273) is animated in response to the speech and rhythms evoked by larger-than-human nature.

The aspirational sketch I outline above is crucially tempered by an explicit recognition of the risks (as I have outlined in the analysis). The agenda of critical eco-aesthetic literacies therefore includes both the critical impulses that manifest in my analysis of specific instances of carbon footprint metaphors in the previous chapters and the more affirmative and hopeful impulses of composing confederacies as described in this conclusion. Critical eco-aesthetic literacies and composing carbon confederacies are therefore two aspects of the same impulse of ‘tracing’ metaphors to: 1) examine the risks of metaphors in re-capitulating normative distributions of the sensible; and 2) explore the promises of these metaphors in re-composing worlds through newly distributed sensibilities.

Carbon footprint metaphors join energetic forces with other ecological metaphors in this critical process. Although recently-emerging ecological metaphors are not yet explicitly elaborated as metaphors *per se*, one begins to witness a further extension of the power of an implicit politics of the metaphorical movement from anthropomorphism-isomorphism within three recent political conceptualizations that have depended on elaborations of what I call “ecological metaphors.” The first is “carbon democracy” (Mitchell 2011), the second is “energy of slaves” (Nikiforuk 2012) and the third is “*this* capitalism” (where “this” implies fossil fuel capitalism) (Vaden 2010). I call these ecological metaphors because they, like carbon footprint metaphors, mediate the entangled relations of natureculture in ways that newly help to bring these relations into visibility. Whereas modern histories have tended to disregard ecological actors as central to politics and history, these metaphors write ecological actors and conditions of

possibility more explicitly into history and politics in ways that map onto Bennett's description of isomorphism as a shared trajectory of mutual conditioning in natureculture.

Timothy Mitchell's *Carbon Democracy: Political Power in the Age of Oil* (2011) re-contextualizes democracy in light of its emergence alongside a material economy of fossil fuels. Whereas conventional histories of democracy have attentively traced the socio-political movements of nations and regions developing into "mature" forms of democracy in a kind of teleological trajectory, Mitchell argues that it is impossible to tell the story of the rise of modern democracy without acknowledging its fundamental enabler, (hydro)carbons; these carbon-dependent relationships, he suggests, have not only created geo-political vulnerabilities in the past, but are also poised to create future crises because of their treatment of hydrocarbons in modern political economies as inexhaustible givens despite their finite material availability. The carbon democracy thesis begins by revealing an isomorphism through the implicit question: *what do carbon and democracy have in common such that they can be drawn together in this metaphor?* According to Mitchell, the material element of carbon and the cultural history of democracy are inextricably linked through a history of political and material movements throughout the 19th and 20th centuries. Mitchell traces the emergence of democracy alongside the move away from agrarian life based on solar, water and wood energy on a small scale, toward larger scale societies enabled by fossil fuels in the forms of coal and oil. These fossil fuels have led to the creation of political economies and technologies based on a seemingly inexhaustible energy regime. He argues that this shift offered opportunities for mass politics and energy on an unprecedented scale, but also created vulnerabilities: the first is "peak oil", where the fiction of a rapid growth economy meets

its limits; and the second is climate change, which threatens to disturb an ecological order upon which life as we know it, and all its derivatives, including democracy, depend. Mitchell draws on hybrid historical and political-economic perspectives in order to carefully revisit and recontextualize major historical events of the 20th century in light of carbon, which he argues has been systematically under-acknowledged as *the* fundamental enabler of the economy and geo-politics in this era. What McKay would call the “sheer muscle” involved in connecting carbon and democracy reveals the power of metaphor to expose certain “truths” associated with the shared structural trajectories of these seemingly unrelated entities. Although Mitchell’s is an historical account, his analysis *and the metaphor itself* gesture toward future-oriented questions around the struggle over meanings of *carbon democracy*. Such struggles might foster attention to notions of citizenship, participation of non-human elements and actors, and importantly, the creation of political institutions that are open to such complexities.

Similarly refiguring cultural-material relations involving carbon, Andrew Nikiforuk’s *Energy of Slaves* (2012) connects a history of slavery dating back to ancient times, with the modern era of fossil fuel dependency as a new form of slavery. Modern societies, he argues, are still acting like slave-holders in our relentless use of cheap “energy slaves” in the form of oil. Despite ‘our’ claims to moral superiority after the abolition of human slavery, Nikiforuk insists that we read our oil dependency as continuous with these forms of slavery because they analogously involve some degree of amassing a pool of cheap expendable labour/resources to do ‘our’ work for us. Massive casualties have always been built into logic of slavery, whereby benefits are accrued by a few based on the degradation of a whole great many others; contemporary forms of

energy slavery are no different for Nikiforuk. His elaboration of this metaphor, itself co-constituted with larger-than-human actors, brings into visibility a critical re-distribution of the sensible of energy regimes. Once again the sheer muscle involved in bringing “slavery” and “energy” together in this metaphor makes one ask *what do these two entities have in common? And how might the moral baggage that accompanies the notion of slavery come to morally charge public conversations on contemporary fossil fuel-enabled energy slave regimes?*¹⁸³

A further example of the metaphorical work of finding parallel trajectories in ‘culture’ and ‘nature’ is Tere Vaden’s re-conceptualization of “this capitalism,” (fossil fuel-enabled capitalism) (2010). Vaden historicizes an analysis of political economies within the regime of oil in which, he argues, it must necessarily be understood. He evocatively asks: "What if the hegemony of the West was not, after all, defined by modern natural science and technology, enlightenment and individualism but by a one-time offering of coal, gas and oil?" (2010, 1). Vaden re-connects the socio-political and ecological through the intervention of naming “this” (fossil fuel) capitalism. For Vaden, the “one-time” gift of fossil fuel has contributed to this specific version of capitalism, not as the end-of-history liberal democratic capitalism, which is often prescribed as the teleological maturation of political-economic forms, but as rather a very context-based and finite social-material political form of organization. *This* capitalism, metaphorically implying fossil-fuel/carbon capitalism, troubles the universalising story of capitalism (and its critiques), by particularizing this form within its current conditions of possibility, which are far from universal and infinitely-available. Again critical questions arise in this

metaphoric re-distribution: *What do capitalism and fossil fuels have in common? What might come after “this capitalism”?*

“Slave energy,” “carbon democracy,” “this capitalism,” “carbon footprint” – these are all compound metaphors in which the modifying terms do the critical work of revealing the historical-material entanglements that shape contemporary conditions. An ecological-material element is compounded metaphorically with a (human) cultural element such that the cultural element is necessarily put into conversation with the material conditions of possibility that fundamentally shape it. Without their modifying terms/metaphors, the terms democracy and capitalism tend to have a teleological and authoritative “end of history” ring to them. Without the modifying metaphor of “slaves,” energy regimes are similarly cast in positivistic terms as simply the taken-for-granted inputs that fuel trajectories of human progress *ad infinitum*. Carbon footprint metaphors walk along and through the coordinates of this new consciousness of material-cultural entanglements in larger-than-human histories. Their presence always equally figures potential species absence in the precarious epoch signalled by the material-cultural matrix of the Anthropocene.

Myriad other metaphors – “Climate debt” (Bolivia 2009; Walsh 2009), “Virtuous carbon” (Paterson and Stripple 2012) – are similarly emerging to bring material-cultural entanglements into the politics of climate change. Although these metaphors require treatment that is beyond this current study, their presence gestures toward the on-going work of critical eco-aesthetic literacies in reconfiguring worlds. Against those who would read metaphor instrumentally as simply a ‘tool’ of communication, or something to be engineered into society, or simply a poetic frill, I insist on reading ecological metaphor as

a complex network of distributed sense-making that at its greatest potential, enables larger-than human sensibilities in creative world-composing:

Aesthetic experience has a political effect to the extent that the loss of destination it presupposes disrupts the way in which bodies fit their functions and destinations. What it produces is not the rhetorical persuasion of what must be done. Nor is it the framing of a collective body. It is a multiplication of connections and disconnections that reframe the relation between bodies, the world they live in and the way in which they are equipped to adapt to it. It is a multiplicity of folds and gaps in the fabric of common experience that change the cartography of the perceptible, the thinkable and the feasible. As such, it allows for new modes of political construction of common objects and new possibilities of collective enunciation. (Rancière 2009, 72)

As Rancière asserts, the aesthetics in which metaphors are involved disrupt the givens of the world by outlining new contours that were previously unthinkable, imperceptible and thus impossible. The Anthropocene names a material-historical epoch in which the need for “the political construction of common objects and new possibilities of collective enunciation” has never been greater. To assert a role for ecological metaphors in this politics of aesthetics is to suggest that these affective mediators are involved in indeterminate processes that may generatively lead to larger than human sense-making in acts of composing worlds in flux. Against the image of the carbon footprint at the beginning which displays what Abram calls the “ever-increasing intercourse with our own signs” (1997, 267), ecological metaphors permanently defer logocentric, anthropocentric mastery to animate an on-going politics of contingency attuned to material relations and processes. In such a case, the answer to a re-mix of Alice’s question - *can ecological metaphors mean so many things, or is one to be master?* – is kept open to allow for emergent and necessary disturbances to a dominant anthropocentric politics of attempted foreclosures.

Notes

¹ This image is found on a few sites including: <http://www.fewresources.org/ecological-footprints--human-impact-metrics.html>; <http://www.beyondrecycling.ca/content/ecological-footprint-3> Accessed May 1, 2013. There are also myriad products from t-shirts to collectable buttons that state “My carbon footprint is bigger than yours”

² Government of British Columbia 2008. Appendix J: “52 ways you can reduce your carbon footprint”. In *Climate Action Plan*. <http://www.livesmartbc.ca/attachments/appendices.pdf>

³ <http://www.carbonfootprint.com/aboutus.html>

⁴ Amazon.com’s Product Description of Playstation 3 game “Trash Panic” <http://www.amazon.com/Trash-Panic-Online-Game-Code/dp/B002GP6WGS>

⁵ I am not suggesting here that markets are not involved in ecological processes beyond humans and should not be part of discussion in climate change politics; rather I am simply questioning the all-encompassing logic that the market can, in and of itself, create climate change solutions. I will elaborate further throughout the dissertation.

⁶ Notably, the authors whom I select to describe each of these critical positions (reflexive about constructivism and reflexive about scientific positivism) all employ both science and critical theory in an attempt to find what Hayles (1995) calls “common ground” in discussing ecological issues. While there still exists debate among these scholars, they all agree on the contributions of some version of post-positivist science and biophysically-attentive constructivist critique.

⁷ Similarly, speaking of climate change discourse, Max Boykoff suggests, “interpretation and knowledge is constructed, maintained and contested through intertwined socio-political and biophysical processes” (2011, 5).

⁸ Here, I wish to acknowledge the double-meaning of *account* and all of its derivatives as they are used both in the sense of a story and in the sense of a economic-mathematical metric; carbon footprint metaphors carry both of these meanings as they set in motion both a calculus of tracking and quantifying carbon numbers through environmental economics *and* stories of those who might ‘count’ in cultural politics of climate change.

⁹ Since Aristotle’s definition, the notion of resemblance has been key to understanding metaphor. Although metaphor scholars in the mid-twentieth century attempted to steer away from the notion of resemblance, noting that the metaphor often *creates* a similarity that does not exist prior to the creative act (Black 1962; Goodman, 1968), this relationship of (created) resemblance is nonetheless part of how metaphors obtain significance. The notion of resemblance need not imply object-to-object similarities within the terms of metaphor, but rather similarities between *relations* to other objects. For Sobolev, “the question is not whether the terms of metaphor are similar (they are in one sense or the other), but whether this similarity plays a central role in the production of meaning” (2008, 909). This (creation of) resemblance then, is key to metaphor; however, paradoxically, this relationship is dependent upon dissonance and contradiction. The fact that metaphors are generally not easily paraphraseable, suggests that metaphors initiate a relationship between entities that are in some kind of contradictory relationship. As Ricouer suggests, “the interplay of resemblance...consists in the initiation of a *proximity* between formerly ‘remote’ meanings” (1977, 230). The workings of metaphor thus initiate a disturbance and call for a contingent or partial resolution of this disturbance through the yoking together of sometimes unlikely things.

This work of yoking together should be not be interpreted as a definitive enclosure around a given metaphor, for metaphors often obtain significance through a degree of openness. This claim productively tempers an overly deterministic account of metaphors in general as a certain structure and will also productively temper the potential pitfalls of attempting to read the carbon footprint metaphor as an expression of a singular orientation toward climate change.

¹⁰ Thomas Hobbes scorn for metaphors for example is evident in the following passage from *Leviathan* (itself ironically, an extended metaphor): “And whereas all bodies enter into account upon divers consideration, these considerations being diversely named, divers absurdities proceed from the confusion, and unfit

connexion of their names into assertions...the sixth [cause of absurd assertions is] the use of Metaphor, Tropes, and other Rhetoricall figures, in stead of words proper. For though it be lawfull to say, (for example) in common speech, *the way goeth, or leader hither, or thither, The Proverb says this or that* (whereas wayes cannot go, nor Proverbs speak;) yet in reckoning and seeking of truth, such speeches are not to be admitted. (Hobbes 1981 114-115)

- ¹¹ When one thinks of computational “networks”, for example, one cannot help but mobilize a number of metaphors that are entanglements of computational and ‘natural’ worlds as they interact: “digital environments”; “distributed intelligence”; “smart metres”; “World Wide Web.” Even on the mundane level of everyday responses to the question, “How are you?,” one can respond metaphorically with: “I’m feeling down/up/ under the weather/over the moon/blue/burnt out/wiped/done/out of my element/over the hump,” and so on.
- ¹² McLuhan’s original line is “Ah, but a man’s (*sic*) reach should exceed his grasp, or what’s a metaphor?” and the Browning line from the poem, Andrea del Sarto, is: “Ah, but a man’s (*sic*) reach should exceed his grasp, or what’s a heaven for?” <http://www.poetryfoundation.org/poem/173001>
- ¹³ For a few exceptions see: W. Mills “Metaphorical Vision: Changes in the Western Attitudes to the Environment” *Annals of the American Association of Geographers* (1982, pp 237-253); Brendan Larson (2011); Star Muir, “The Web and the Spaceship: Metaphors of the Environment” *ETC A Review of General Semantics*, Summer, Vol 51, 2: 145-152 1994
- ¹⁴ In Chapter 4, for instance, one of my examples is from global climate governance circles.
- ¹⁵ Larson (2011, 127-150).
- ¹⁶ Thus, while “cold war” for example, is a critically important political metaphor that no doubt carries implicit ecological implications and effects, I am not calling such metaphors “ecological metaphors.” By contrast, I am indexing metaphors like “invasive species” and “tragedy of the commons,” which explicitly conceive of larger than human relations, with the notion of “ecological metaphor.”
- ¹⁷ Brendan Larson takes on this invasive species metaphor in an entire chapter of his book (2011, 160 – 193). He suggests that other metaphors such as “ecosystem saturation” (189) might shape different approaches than the all-out battle suggested by “invasive species.” Hobbs, Higgs and Hall (2013) suggest the notion/metaphor of “novel ecosystems” as a way to engage with complexity rather than “invasive species” which reifies an essentialist binary of “native” vs “invasive.”
- ¹⁸ I am thinking simply of dictionary definitions of environment that feature words like “setting,” “surroundings,” etc. See: environment. Dictionary.com. *Dictionary.com Unabridged*. Random House, Inc. <http://dictionary.reference.com/browse/environment> (accessed: July 17, 2013).
- ¹⁹ Again, I am relying simply on dictionary definitions that highlight “relations and interactions between organisms and their environment, including other organisms.” See: ecology. Dictionary.com. *Dictionary.com Unabridged*. Random House, Inc. <http://dictionary.reference.com/browse/ecology> (accessed: July 17, 2013)
- ²⁰ The term ecology does not escape critical debate in extant literature. Martin O’Connor (1988, 147), for example, speaks of the “inherently duplicitous” terms like “ecological balance”; “taking everything into account” that traffic between economic and ecological agendas. Such debates are relevant to the spirit of my inquiry, but must be bracketed for now in favour of providing a contingently stable meaning of *ecological metaphor*.
- ²¹ Even Marxist theorist, David Harvey who criticizes the “naturalist” politics of environmentalism concedes that “the environmental transformations that are now underway are larger scale, riskier, and more far-reaching and complex in their implications...than ever before in human history” and thus require engaging with paradoxes (Harvey 1998, 5).
- ²² I have already removed from my text two metaphors that triggered negative responses from readers. The first was ‘interrogate’ which I used to suggest a critical stance toward an instance of the carbon footprint metaphor; one reader suggested ‘interrogate’ triggered for him the idea of “intellectual water-boarding” which should not be part of collegial engagement. Another reader objected to the phrase “the carbon footprint *flies below the radar*” in its appeal to militaristic logic. These comments interestingly reveal that

metaphoric interpretation involves dialogic relations with “apperceptive” readers (Bakhtin 1981) who bring with them certain stances toward what is being carried over by metaphor. These encounters reveal an excess beyond authorial intent that further reinforces a shiftiness of metaphors.

- ²³ Here I am following a number of books and articles that present this story for lay audiences including: Abatzoglu et al 2007; Boykoff (2011); Flannery (2005); Fleming (1998); Giddens (2009); Weaver (2008). The father figures usually include some combination of Jean Baptiste Joseph Fourier (1924), John Tyndall (1858), Svante Arrhenius (1896), Guy Stewart Callendar (1938), Roger Revelle and Hans Suess (1957), Charles Keeling (1970), Syukuro Manabe and Richard Wetherald (1975).
- ²⁴ Climate science encompasses meteorology, hydrology, paleoclimatology, mathematics, oceanography, glaciology, soil chemistry, forestry and other fields and is a far more complex undertaking than I have outlined here. For more detailed understandings of the contributions of each, please see Weart (2003); Weaver (2008).
- ²⁵ Anishanaabe scholar Vanessa Watts calls these practices “indigenous place-thought” where thought and actions take place through relations written through the land and into the flesh rather than from the perspective of a Cartesian separation of mind and body. (2013, 32-33)
- ²⁶ See for example: Callendar. G.S. (1938) “The Artificial Production of **Carbon Dioxide** and its influence on Climate”; Revelle & Suess (1957) “**Carbon Dioxide Exchange** between Atmosphere and Ocean and the Question of an increase of atmospheric **CO₂** during the Past Decades”. Keeling, C.D. (1970). Is **Carbon Dioxide** from Fossil Fuel Changing Man’s Environment?”; Manabe and Wetherald (1975). “The Effects of Doubling the **CO₂** concentration on the climate of a General Circulation Model.”
- ²⁷ Bruno Latour and his colleagues (John Law, Michael Callon, Rip) of the Ecole des Mines in France have spent years following the work of scientists to develop what has become known as “Actor Network Theory” or ANT. This theory understands that lab animals, granting organizations, texts, and a host of other human and non-human actors, are all part of the network that combines to produce the work of science. See, for example, Latour (1987).
- ²⁸ As Spencer Weart’s *The Discovery of Global Warming* (2003/2014) describes, there were a number of other key events, scientific studies and the beginnings of political responses to what was becoming the consensus of global warming. These events understandings and responses also intersected with a number of other issues like the “Energy crises” of 1973 and 1979, the ozone depletion issue (with the Montreal Protocol of 1987 responding with international restrictions on anthropogenic ozone-depleting gases); acid rain; and a broader concern for pollution that began in the 1960s, with Rachel Carson’s book *Silent Spring* (1962) often accredited with helping establish a widespread apprehension and political movement of environmentalism. For a more complete description of these intersecting concerns, see Weart (2003).
- ²⁹ https://www.wmo.int/pages/themes/climate/international_wcc.php
- ³⁰ https://unfccc.int/essential_background/background_publications_htmlpdf/climate_change_information_kit/items/300.php
- ³¹ Ahmed provides one illustrative example about an affective encounter between a child and a bear leading to the fearful running from the bear of the child (2004, 7-8). While she does note that the fear is not ‘in’ the child, but is a “matter of how the child and the bear come into contact,” she still concludes by the human reading of the bear as an object of fear (Ibid). The ‘sociality’ of affect in her theorizations generates critical reflection on the politics of human emotions, but her program does not extend to nuanced forces and processes of larger than human politics.
- ³² And just as affect gets mobilized for a variety of effects as I describe below, the non-human agency of cold ‘weather’ and human interpretations of cause and effect can decisively forestall politics of climate change.
- ³³ <http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>
- ³⁴ https://unfccc.int/kyoto_protocol/items/2830.php
- ³⁵ https://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php
- ³⁶ https://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php

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- ³⁷ https://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php
- ³⁸ <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCARBONFINANCE/0,,contentMDK:22592488~pagePK:64168445~piPK:64168309~theSitePK:4125853,00.html>
- ³⁹ This is what Karl Polanyi calls the “double movement” of the forces of market liberalism as they attempt to remove barriers to global flows of capital and the counter-movement of social protection which in turn imposes regulations to reign in liberal market forces of capital accumulation. Nancy Fraser (2013) and Mann (2013) update Polanyi’s argument given the neo-liberal turn in globalization since the 1970s whereby state actors have not played the role of social protector, but have rather de-regulated and re-regulated to facilitate a the power of market (neo) liberalism.
- ⁴⁰ The rationality as an historical-political development has also been described by Foucault in the *Birth of Biopolitics* (2008).
- ⁴¹ Although notably, his gesture towards policy choices of humanity also resonate with a dominant and troublesome diffusion model of science-to-policy-to-public.
- ⁴² This is not to say that “consensus” means unanimity; crucially, some of the same lobbies involved in the GCC have remained on the scene to query consensus. In 2009, for example, the “Climate-gate” scandal during which some IPCC scientists were found to have selectively chosen certain data, provided fuel for the fire of deniers of anthropogenic climate change. Nonetheless, as Oreskes suggests, these “well-financed contrarians” are a very small minority (2007, 77).
- ⁴³ More on these in the chapters that follow.
- ⁴⁴ See Google trends for searches of carbon footprint at:
<http://www.google.com/trends?q=carbon+footprint%2C+ecological+footprint&ctab=0&geo=all&date=all&sort=0>
- ⁴⁵ The Merriam Webster dictionary suggests that the first known use of the phrase occurs in 1999 but I have not been able to find this (<http://www.merriam-webster.com/dictionary/carbon%20footprint>)
- ⁴⁶ A web search for Safe Climate’s carbon footprint calculator yields the following message that depicts the slipperiness of carbon footprint (calculators): “WRI does not currently support or endorse any carbon footprint calculators. The methodology and accuracy of these tools may vary, and are the responsibility of the organization that hosts each one.” (WRI Safe climate)
- ⁴⁷ Although carbon footprint calculators do not comprise one of my 3 case studies, I do discuss them as co-productive of ‘carbon subjectivity’ along with carbon footprint reduction lists in Chapter Three
- ⁴⁸ In particular, the Rockefeller Bros fund was built at its origins through oil extraction. The Rockefeller brothers co-founded Standard Oil whose successors in the wake of anti-monopoly rulings include Esso, Chevron, Exxon and Mobil. Of course, the Ford Foundation legacy was created through the mass production of automobiles. While the MacArthur Foundation was not built expressly on fossil fuel industries, billionaire-philanthropist John D. MacArthur built his wealth through the finance capital of large real estate holdings in Florida and through his insurance company
<http://www.macarthur.org/about/our-history/>
- ⁴⁹ See, for example, “Is Global Warming Fueling Katrina?” in Time Magazine, an article that ran as the hurricane was ravaging New Orleans. <http://content.time.com/time/nation/article/0,8599,1099102,00.html>
- ⁵⁰ See for example Ross Gelbspan’s Boston Globe Op-ed piece entitled Katrina’s Real Name”
<http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?id=5444&method=full>
- ⁵¹ See for example: <http://boxofficemojo.com/genres/chart/?id=documentary.htm>; and
<http://www.pbs.org/pov/blog/2012/12/the-25-greatest-documentaries-of-all-time/27/#top>
- ⁵² Carbon. Dictionary.com. *Collins English Dictionary - Complete & Unabridged 10th Edition*. HarperCollins Publishers. <http://dictionary.reference.com/browse/carbon> (accessed: July 12, 2013).
- ⁵³ See for example: diamond. Dictionary.com. *Collins English Dictionary - Complete & Unabridged 10th Edition*. HarperCollins Publishers. <http://dictionary.reference.com/browse/diamond> (accessed: July 12, 2013).

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- ⁵⁴ *Encyclopædia Britannica Online*, s. v. "allotropy," accessed May 09, 2013, <http://www.britannica.com/EBchecked/topic/16560/allotropy>.
- ⁵⁵ allo-. Dictionary.com. *Dictionary.com Unabridged*. Random House, Inc. <http://dictionary.reference.com/browse/allo-> (accessed: May 09, 2013).
- ⁵⁶ -trope. Dictionary.com. *Collins English Dictionary - Complete & Unabridged 10th Edition*. HarperCollins Publishers. <http://dictionary.reference.com/browse/-trope> (accessed: May 09, 2013).
- ⁵⁷ With the advent of the carbon allotrope of fullerenes first prepared in 1985, has come the "beginning of an era of synthetic carbon allotropes" (Hirsch 2010, 868).
- ⁵⁸ "Smalley Institute Grand Challenges: Nanoscale Science and Technology" (2008) Rice University <http://cnst.rice.edu/content.aspx?id=246>
- ⁵⁹ I am alluding to the traditional tales of tricksters – Anansi stories from West Africa via Jamaica and Brer Rabbit stories from Central & Southern Africa via the American South – that I grew up on as a Jamaican-Canadian. While I am aware that there is a postcolonial field of studies about the political implications of these trickster tales and their contested meanings, I am not engaging this field here. I wish only to highlight that tricksters come off in these stories ambivalently as, at times heroic and other times villainous. This kind of "trickster" agency is also theorized by Donna Haraway as a means of "giving up mastery...making room for surprises and ironies at the heart of all knowledge production [since] we are not in charge of the world." (1988, 184) Understanding carbon in this way as an allotropic trickster is born of both personal experience with trickster stories, and the impulses of feminist science studies that temper a scientific apprehension of carbon as the only way of knowing about this element that is as much metaphor as it is material.
- I do not intend to suggest that carbon as a trickster figure is singularly capable of out-smarting what Nicole Shukin (after Hardt and Negri) calls "Empire" – as an index of globalizing capital power. Indeed, as she points out (personal communication), carbon footprint metaphors often work to support "Empire"; yet if one grants carbon both a cultural and material power as I do, carbon cannot help but undermine such capital circuits even as carbon is also discursively captured to support this logic. In other words, carbon is ambivalent, just as Anansi the spider, who is both cunning and greedy. What he stands for depends on the story in which he is involved – just like carbon. (see: http://anansistories.com/Traditional_Stories.html)
- ⁶⁰ Janet Bord compiles stories and images of footprint that are imprinted in stone as signs of permanence of beings, be they saints or demons, or animals. In Aztec culture, there was a "belief that a deity or divine personage could leave some of their power behind in their footprints" (Bord 2004, 7).
- ⁶¹ http://www.oxforddictionaries.com/definition/american_english/footprint?q=footprint
- ⁶² See, for example: Chakraborty 2003; Smit-Marais 2011 for postcolonial readings of Defoe.
- ⁶³ Jacques Derrida figures "la trace" (one of whose meanings in French is, significantly, "footprint") of signifiers as a constitutive presence and absence relation, and therefore, a space highly invested in political relations of visibility and invisibility (1967/1997, 70-72). "The presence-absence of the trace" suggests "its play" as a disruption to complete explanations of language, science and any other pursuit that pretends to objectivist accounts (Ibid). Derrida proposes a "problematic of the trace" suggesting "that the place of the one and of the other must constantly be in movement" (Ibid, 70).
- ⁶⁴ This emphasis on appearance and vision is admittedly fraught with discourses of "ableism," that place primacy on the human sensory capacity to see. Nonetheless, with Bennett, Rancière and Derrida, I claim a politics of appearance/disappearance as necessary even as I wish in future work to disturb its sensory exclusivity and to insist more on the partiality of vision.
- ⁶⁵ Derrida's notion of 'hauntology' against "ontology" or "Being" names this irreducible category of apparitions to which, I suggest, the footprint also gestures. The footprint itself "is neither living nor dead, present nor absent: it spectralizes" (1994, 63).
- ⁶⁶ There is also a popular Leona Lewis song from the year 2008 that was loosely based on the Stevenson poem. <http://www.azlyrics.com/lyrics/leonalewis/footprintsinthesand.html>
- ⁶⁷ The two sets of footprints in the sand register this steadfast companionship and transcendental love. Questioning God as to why there is, in the subject's time of greatest need, only one set of footprints in the

sand, God responds by saying that during a time of particular need, God himself was carrying the subject.
<http://www.footprints-in-the-sand.com/index.php?page=Poem/Poem.php>

- ⁶⁸ The positive associations do not entirely disappear, as I suggest below in the section describing the discourses of “leave only footprints.”
- ⁶⁹ See for example the Global Footprint Analysis’ description at http://www.footprintnetwork.org/en/index.php/GFN/page/at_a_glance/
- ⁷⁰ Using the tool, Google NGram viewer, one can see the kinds of hits elicited by a search of ecological footprint yield specialized titles for organizations such as *The Ecological Footprint of Cities* (1998) and *The Ecological Footprint of Hostel Tourists in Ontario and Quebec* (2008), whereas, the carbon footprint elicits titles such as *How to Reduce Your Carbon Footprint* (2008) and *Reducing your Carbon Footprint on Vacation*(2008)
http://books.google.com/ngrams/graph?content=carbon+footprint%2C+ecological+footprint&year_start=1990&year_end=2013&corpus=15&smoothing=3&share= (accessed May 12, 2013).
- ⁷¹ This claim is corroborated by the Google search Trends function which tracks frequency of results for the two terms <http://www.google.com/trends?q=carbon+footprint%2C+ecological+footprint> Retrieved March 24, 2011.
- ⁷² An “ironic predicament is, in fact, written into the very term *literal*, itself based on the metaphor of the written character, the letter, being used to stand for a certain kind of meaning. The letter is itself nothing but a figure, a concrete image, for this kind of literal meaning that is purportedly devoid of figurativeness” (Franke 2000, 140).
- ⁷³ This quote is attributed to Chief Seattle or Chief Sealth from the Pacific Northwest (1780-1866), in various places on the web (eg <http://quotationsbook.com/quote/26014/#sthash.LBpeKP57.dpbs>), but there is also speculation that the phrase came from a white ecologist who suggested Sealth as the origin of the phrase (Warren Magnusson, personal communication).
- ⁷⁴ This text is found on a variety of websites including the Israeli Foreign Affairs website <http://israelforeignaffairs.com/watch-where-you-step-understanding-your-carbon-footprint/>
- ⁷⁵ Crucially, not all of these will resonate with all readers, nor will I have gestured at all of the interpretations of footprint metaphors that readers will bring to their readings. In discussions with readers of this text, each reader might favour a different interpretation of what footprint metaphors might evoke. While I cannot do justice to all of these metaphorical allusions, their very plurality confirms the struggle in which carbon footprint metaphors are embroiled.
- ⁷⁶ This is not to say that the connecting thread of experience of ‘weather’ always leads to movement to act on climate change. The event of cold weather also presents the opportunity to confirm bias against the thesis of anthropogenic warming.
- ⁷⁷ Whether one attributes a difference in degree (Ngai 2005) or kind (Massumi 2002) between affect and emotion, there is a recognized connection between the two – either a discursive “capture” type relation in Massumi or a “dialectics” in Woodward.
- ⁷⁸ Although here I would nuance this statement by saying that different ‘languages’ and semiotics come into play as well as ‘words,’ such that visual arts, music, and the like also narrativize experiences.
- ⁷⁹ I will supplement this notion with the interventions of Bruno Latour (2004) and Jane Bennett (2010) who insist that political actors (or “actants,” in Latour’s terms) include larger-than-human forces that exceed Rancière’s theorizations of political actors.
- ⁸⁰ Levinas (1969) presents infinity as a disturbance to the totality of the logic of ‘being’/ontology. He suggests “the infinite cannot be thematized” (211) and thus the notion of “infinity” interrupts the knowing subject of ethics/politics and insists on a quality of ‘not-yetness’ that will never be realized or totalized by a knowing, being subject.
- ⁸¹ In *The Poetics* (1997), under his trademark taxonomic logic, Aristotle names four kinds of metaphors used in Greek tragedies: “A metaphor is the application [to something] of a name belonging to something else,

either (a) from the genus to the species, or (b) from the species To the genus, or (c) from a species to another species, or (d) according to analogy.” I take two fundamental premises from Aristotle’s theorizations. First, by positioning normal language as a kind of proprietary relationship between a ‘thing’ and its rightful ‘name’, Aristotle asserts metaphor as a kind of deviation to this normatively conceived labelling function of language. Although he does allow four different categories of metaphor in *The Poetics*, Aristotle’s conceptualizations do not stray far from his take on metaphors as “...the application of a noun which *properly* (my emphasis) belongs to something else”⁸¹. While his first theorizations also gesture at the important attributes of resemblance and dissonance (to be discussed below) at the heart of metaphor, there has been a tendency to emphasize Aristotle’s take on metaphor as *exceptional* language layered onto or supplementing *proper* language rather than a view of metaphor as constitutive of language, thought, and inescapably, of politics in ways that are deeper than a rhetorical art of persuasion⁸¹. Metaphors, I argue are too pervasive to be deemed ‘exceptional’, but their disturbing (tensive) qualities are what makes them seem exceptional and what makes them both powerful and subject to marginalization at the same time. Their ‘disturbing’ quality emerges from this regime in which they are understood as undermining the misapprehended labelling function of language, itself an enduring, though contested distribution of the sensible of language. But rather than conceive of this disturbance negatively, I affirm a role for certain metaphors as explicit disturbances of a normative distribution of the sensible.

- ⁸² For example, Latour (2004) evocatively suggests the composition of the world involves “adding voices to the choir” when the process may not always be as “harmonious” as the metaphor suggests.
- ⁸³ Perhaps most iconically, Deleuze and Guattari (1987) toggle between metaphors for bodies that seem ‘organic’ and those that seem machinic – “rhizomes”, “bodies without organs” and “machinic assemblages” – to present a new conceptual vocabulary for gesturing at and deliberately intermingling themes of technology and ecology.
- ⁸⁴ Pratt defines contact zones as “social spaces where disparate cultures meet, clash and grapple with each other, often in highly asymmetrical relations of domination and subordination-like colonialism, slavery or their aftermaths as they are lived out across the globe today (1992, 4).
- ⁸⁵ This is not to suggest that Ahmed does not attend to the relations of subordination and domination that Pratt is highlighting, but rather that she doesn’t mobilize ‘contact zones’ a la Pratt to do this conceptual work, but rather carves out her own meanings of contact zones, without mention (knowledge?) of Pratt’s.
- ⁸⁶ Ahmed’s goal of understanding and critiquing the affective generation of racialized bodies is utterly dependent upon historical understandings of racial hierarchies that have been naturalized.
- ⁸⁷ With thanks to Eric Higgs for a conversation that we had in the early stages of my studies. His work on the ambivalent entanglements of nature and culture, and indeed his ‘tale of two wildernesses’ in the book *Nature by Design*) helped to inform my set of case studies as a “tale of three footprints,” where each footprint offers both promises and risks, depending on its attachments and orientations.
- ⁸⁸ One could write an entire dissertation on carbon footprint metaphors as 1) mechanisms of “carbon subjectivity” or 2) gestures at global “carbon citizenship” or 3) sites of emerging ecological actors brought into discourse, or myriad other singular internally-cohesive readings; however, to do so would be to miss the political ecology of these metaphors as shifty sites of tension as they have come to appear in the years since they emerged.
- ⁸⁹ This latter type of intertextuality has been called “interdiscursivity” by those in the Critical Discourse Analysis tradition. See, for example, Fairclough (1992, 117).
- ⁹⁰ The full quotation may be more illustrative of the hybridity of the term: “Current genre studies (which incidentally tend to concentrate on non-literary texts) probe further; without abandoning earlier conceptions of genres as ‘types’ or ‘kinds’ of discourse, characterized by similarities in content and form, recent analyses focus on tying these linguistic and substantive similarities to regularities in human spheres of activity. In other words, the new term ‘genre’ has been able to connect a recognition of regularities in discourse types with a broader social and cultural understanding of language in use” (Freedman and Medway 1994 1).
- ⁹¹ <http://www.paidtwice.com/2007/10/15/10-ways-to-reduce-your-carbon-footprint-and-9-of-them-will-save-you-money>

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- ⁹² I am thinking of certain texts and practices in North American society as diverse as: the famous David Letterman “Top 10” lists on a variety of different topics; Steven Covey’s best-selling *Seven Habits of Highly Effective People*. Such lists expose a generalized calculative practice that is rendered in pithy digestible terms for individual subjects.
- ⁹³ See for example: <http://biofuel.tamu.edu/publications/tensteps.pdf>; <http://www.squidoo.com/Carbon-Footprint-2> and the book lists: Bohmholdt (2010); Yarrow (2008)
- ⁹⁴ The Brave New Climate list from 2008 is one such example of a top-10 list that suggests offsets: <http://bravenewclimate.com/2008/08/29/top-10-ways-to-reduce-your-co2-emissions-footprint/>
- ⁹⁵ By de-centering the subject in this way, Foucault is asserting a difference between positions like: the Cartesian knowing subject that presents a unified individual through consciousness; and a Freudian or Lacanian version of “split subjectivity.”
- ⁹⁶ At the time of initial writing of this chapter, the term “carbon subjectivity” did not seem to be in use as evidenced by its lack of appearance through searches in both scholarly and popular contexts. In 2014, this term seems to be emerging on the scene to be theorized as is evidenced by invitations to think through something called “low carbon subjectivity in a CFP for a conference http://www.svet.lu.se/documents/vt2014_stripleworkshop.pdf Two of the authors of this CFP are Johannes Stripple and Matthew Paterson, whose work on “governmental” subjects of climate change I heavily depend on in what follows. Importantly, however, while this CFP uses the notion of “low carbon subjectivity,” my theorization on the risks of “carbon subjectivity” built within carbon footprint reduction lists suggests that subjects are not always occupied with “lowering” their carbon emissions; therefore, the as-yet un-theorized notion of “low carbon subjectivity” may gesture toward a different set of considerations than I am elaborating here.
- ⁹⁷ I am thinking of Judith Butler’s extended and explicit engagement with the “paradoxes” of subjectivity whereby one is subjected to forces of power in becoming a subject, but one also willingly submits to the terms of subjectivity as these are also the terms by which one is guaranteed a political place as a speaking agent. *The Psychic Life of Power* (1997) presents a comprehensive engagement with these paradoxes through various theorists of subjectivity. I will not engage here with all of these theories, but I wish to flag Butler’s work as exemplary of what I am calling a metaphorical struggle through theories of subjectivity. Rancière’s position on the “opening of a space for political subjectivity”, though not included in Butler’s account since it arrived later, would fit within Butler’s ambivalent take on subjectivity as both a precondition for, and limit to, forms of political agency.
- ⁹⁸ As I mention below in analyzing the risks, bringing individuals into these politics offers not only promises, but the risks of de-politicizing consumer-oriented individuals as well.
- ⁹⁹ The reference to snow on the kitchen floor in this passage revealingly gestures toward the hailing of a subject in the global North.
- ¹⁰⁰ In developing a notion of partial situated knowledges, Haraway suggests, “We are also bound to seek perspective from those points of view, which can never be known in advance, that promise something quite extraordinary”
- ¹⁰¹ As I indicate in Chapter One, part of the appeal to individual carbon subjects must also be regarded as a failure of the preceding attempts to deal with climate change through structures of global and national governance.
- ¹⁰² I do not wish to generalize this feeling too broadly, nor to suggest that all liberal consuming subjects now feel guilt with the prospect of travelling; I simply wish to suggest that for those who most strongly feel the pull to change their practices vis-à-vis fossil fuel consumption, guilt may play a large part in examining these practices that might have been less problematic prior to climate change consciousness.
- ¹⁰³ Food carbon accounting, for example is notoriously complex. You are told in one list to “buy organic” and on another, *don’t* buy organic because it is more carbon intensive. Similarly, local food is pitched alternately as a hero, or as a demon. The bottom line: confusion abounds for the carbon subject
- ¹⁰⁴ http://www.livesmartbc.ca/homes/h_calc.html

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- ¹⁰⁵ <http://www.carbonfootprint.com/minimiseconf.html> Accessed June 13 2012.
- ¹⁰⁶ <http://www.carbonfootprint.com/minimiseconf.html>
- ¹⁰⁷ In *The Jevons Paradox and the Myth of Resource Efficiency Improvements* (2008), Polimeni unpacks what Jevons identified as the paradox of increased energy use in the wake of efficiency improvements (eg bigger cars get produced as engines get more efficient)
- ¹⁰⁸ <http://savingspecies.org/?p=76>
- ¹⁰⁹ See World Bank Carbon finance Data at:
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCARBONFINANCE/0,,contentMDK:22592488~pagePK:64168445~piPK:64168309~theSitePK:4125853,00.html>
- ¹¹⁰ <http://www.climatepath.org/> June 7, 2012.
- ¹¹¹ <http://www.climatepath.org/projects/innovation/cambodiancookstoves>
- ¹¹² Figures for the year 2010.
http://carbonfootprintofnations.com/content/carbon_footprint_worldwide_1990_2010/
- ¹¹³ <http://www.climatepath.org/projects/innovation/cambodiancookstoves>
- ¹¹⁴ Hertwich and Peters, “Carbon Footprint of Nations: A Global, Trade-Linked Analysis” in *Environmental Science and Technology* Vol 43, No 16. 2009, p. 6414. <http://pubs.acs.org/doi/full/10.1021/es803496a>
- ¹¹⁵ According to “most read articles” category on website on November 23, 2012. See <http://pubs.acs.org/action/showMostReadArticles?topArticlesType=recent&journalCode=esthag>
- ¹¹⁶ Unique visitors represent 60 000 of these 78 000 visits. Personal communication with website administrator, Christian Solli, December 10, 2012.
- ¹¹⁷ Edgar Hertwich is a professor of energy engineering and lead analyst in Global Energy Assessment which “defines a new global energy policy agenda” through technical and policy guidance for both the global public and the commercial sectors
<http://www.iiasa.ac.at/web/home/research/researchPrograms/Energy/Home-GEA.en.html>
- Glen P. Peters is a researcher for the Centre for International Climate and Environmental Research –Oslo (CICERO) who has written numerous peer-reviewed research papers for journal such as *Climate Policy*; *Carbon Management*; and *Energy Policy*.
http://www.cicero.uio.no/employees/homepage.aspx?person_id=1067&lang=en
- Other contributors, Tommy Wiedmann and Jan Minx are also specialists in environmental economics and carbon accounting in the U.K. and Australia, and among the early definers of carbon footprint analysis
- See Wiedmann, T. and Minx, J. (2008). “A Definition of ‘Carbon Footprint’”. In: C. C. Pertsova, *Ecological Economics Research Trends*: Chapter 1, pp. 1-11, Nova Science Publishers, Hauppauge NY, USA.
- ¹¹⁸ Whereas the ecological footprint metaphor analysis yields a figure indicative of space (hectares of land that are appropriated, or number of “Earths” required by given lifestyles in bioregions), the carbon footprint analysis yields a weight (tons of CO₂ equivalent). Might it then be a stretch to conceive of the carbon footprint as a political space in the way that Dobson considers the ecological footprint, which already has a geo-spatial measure built into the notion? Such questions that trouble what might be meant by political space and the critique of the wider intelligibility of the (ecological) footprint as it fails to definitively structure the “where” of the polis (Hayward 2006a) lead to an understanding of the metaphorical nature of political space.
- ¹¹⁹ (<http://carbonfootprintofnations.com/content/faq>)
- ¹²⁰ http://www.carbonfootprintofnations.com/content/frequently_asked_questions/
- ¹²¹ http://carbonfootprintofnations.com/content/wealth_and_responsibility/
- ¹²² http://www.carbonfootprintofnations.com/content/frequently_asked_questions/
- ¹²³ <http://carbonfootprintofnations.com/content/faq/>

¹²⁴ <http://carbonfootprintofnations.com/content/faq/>

¹²⁵ <http://www.climatechangeconnection.org/Solutions/Contractionandconvergence.htm>

¹²⁶ In a 2000 federal roundtable on issues surrounding climate change, one of the outcomes suggested was the creation of hubs in each of the provinces as part of a public education and outreach initiative. This network was aimed at moving Canada toward climate change governance which was at the time in large part guided by the principles of the Kyoto Protocol to which Canada signed on in 1998. Major focuses of the Protocol were the emissions targets of each signatory nation, so the interplay of international and national scales was brought to bear in each country who had to find their own means of moving a public and policies toward emissions reductions. In the years 2000-2005 under the Liberal party, a flurry of federal attention on climate change and mitigation targets enabled the development of a number of initiatives and campaigns such as the One-Tonne Challenge¹²⁶ whose aims were to move and incent the Canadian public to reduce emissions. In a similar vein, with goals of outreach and education, regional hubs such as Climate Change Connection were initiated in large part through federal funding. In 2006, however, with the election of a Conservative minority in Canada, federal funding of these hubs ceased, along with any explicit agenda to deal with climate change. The Conservative government instead pursued a less contentious and less aggressive 'clean air' agenda and favoured a 'made in Canada' solution that departed from Kyoto.¹²⁶ Despite the lack of federal funding, the Manitoba hub continued under the banner of Climate Change Connection with funding supplied by the provincial government and by the provincial energy-provider, Manitoba Hydro.

¹²⁷ <http://www.climatechangeconnection.org/default.htm>

¹²⁸ <http://www.climatechangeconnection.org/Solutions/Contractionandconvergence.htm>

¹²⁹ <http://www.climatechangeconnection.org/Solutions/Contractionandconvergence.htm>

¹³⁰ (<http://www.merriam-webster.com/dictionary/apartheid>)

¹³¹ Data are from the year 2010.

¹³² <http://oilsandstoday.ca/topics/ghgemissions/Pages/default.aspx>

¹³³ From the UK based web-site ResponsibleCitizen at <http://www.responsiblecitizen.co.uk/the-environment-citizenship.html> Retrieved March 24, 2011. This frame of citizenship is one that the UK, in particular is pushing heavily in governance discourse and educational curricula.

¹³⁴ <http://www.responsiblecitizen.co.uk/the-environment-citizenship.html>

¹³⁵ <http://www.responsiblecitizen.co.uk/the-environment-citizenship.html>

¹³⁶ This website is listed as one site that is funded by the parent developer company, pti, a for-profit company owned by the founder of the website; what becomes even more intriguing, however, is the prominent advertising on this site. Under the tab "The Environment and Citizenship" from which the above carbon footprint metaphor quotation is extracted, an advertisement appears well before the text describing the heading. This ad leads with the title "Fracking and Water Use" and the sub-title, "A completed natural gas well is about the size of a two-car garage." (morefactslessfriction.ca, nd) Clicking on this text takes you to the website morefactslessfriction.ca which presents a very happy story of the controversial hydraulic fracturing process. Thus, following the carbon footprint on this site takes you to BC and Alberta where the process of fracking is described as a "safe technology regulated by government." (morefactslessfriction.ca, n.d.) The site leads its barrage of good press on this process with a paragraph entitled (ironically) "taking water seriously" in which the reader is told how fracking is done to protect water and that the natural gas industry itself is developing its own best principles and practices for regulating this newly developed process. Further, "[m]ore than 175,000 wells have been hydraulically fractured in Alberta and British Columbia over the past 60 years with no evidence of groundwater contamination, according to regulators in both provinces." (Ibid). Not surprisingly, the logo of the Canadian Association for Petroleum Producers (CAPP) appears at the bottom of the page, revealing that the whole website is a PR campaign for the powerful fossil fuel industry in Canada. This is not the place to engage in an extended discussion of hydraulic fracturing, but rather to highlight a distribution of the sensible whereby a carbon footprint metaphor, through a process of commercial and discursive penetration (not unlike the material process of fracking itself) becomes associated with a normative regime of resource extraction. The tensions of agendas

and interests promoted by following this particular set of carbon footprints reveals a fractured path from a seemingly innocuous, possibly productive site of citizenship in a British context to a full-on endorsement of a fraught process of fossil fuel extraction by those who stand to profit enormously from its continuation. Though this path of the footprint may seem tangential to the main one of carbon citizenship, it is becoming surprisingly well-travelled as a neo-liberal regime of resource extraction dependent citizenship.

- ¹³⁷ Jamie Lorimer (2010) mobilizes a combination of Latour's 'actor-network-theory' and theories of affect to analyze international conservation volunteering as an instance of global environmental citizenship that works in part through human attachments to non-humans. While such international conservation volunteering can be criticized as exemplary of neoliberal and asymmetrical geographies, Lorimer also suggests that this activity also "brings into being a transnational more-than-human citizenry comprising multitudinous non-human forms and process" (2010, 418)
- ¹³⁸ I wish to acknowledge that 'vitality' as a notion/metaphor also carries along with it the notion/metaphor of 'lethality' as living and dying are inherently interrelated. While it may be counterintuitive to suggest 'carbon vitality,' when the relations with carbon at this juncture seem to be 'lethal' as one reader indicated, I would like to keep the analysis in the terms of 'promises' and 'risks' of carbon vitality, instead of introducing "carbon vitality" and "carbon lethality" as two different notions.
- ¹³⁹ Jude Isabella "Jumbo-sized carbon footprint of farmed shrimp tracked by scientist. February 17, 2012 The Tyee.
- ¹⁴⁰ <http://www.aaas.org/>
- ¹⁴¹ <http://phys.org/help/about-us/> Retrieved March 10 2012.
- ¹⁴² <http://dawn.com/2012/02/19/tiny-shrimp-leave-giant-carbon-footprint-scientist/>
- ¹⁴³ <http://www.estuaries.org/about-us.html> Retrieved March 10, 2012
- ¹⁴⁴ <http://www.bonappetit.com/blogsandforums/blogs/badaily/2012/02/imported-shrimp-has-a-carbon-f.html> Retrieved March 12, 2012
- ¹⁴⁵ Notably the word "Imported" leading this headline risks a certain displacement of carbon footprints to global "elsewheres" even as it promises to connect shrimp-eaters in the Global north to their emissions' legacies
- ¹⁴⁶ <http://www.bonappetit.com/blogsandforums/blogs/badaily/2012/02/imported-shrimp-has-a-carbon-f.html>
- ¹⁴⁷ And potentially *disconnect from*, as I take up later in this chapter in the section on risks.
- ¹⁴⁸ As the previous chapter insists, "human" must still be internally differentiated, so one may think of Haraway's notion of "situated knowledges" as they vary across intra-human lived experiences.
- ¹⁴⁹ <http://www.gaalliance.org/newsroom/news.php?Dated-Erroneous-Assumptions-Yield-Misleading-Carbon-Footprint-For-Farmed-Shrimp-59> Accessed February 1, 2013
- ¹⁵⁰ Jim Carrier "All You Can Eat : A Journey Through a Seafood Fantasy" *Orion* March April 2009 <http://www.orionmagazine.org/index.php/articles/article/4395>
- ¹⁵¹ http://seafish.org/media/publications/Assessing_the_true_cost_of_farmed_seafood_D_Lee1.pdf
- ¹⁵² Notably, "Rainforest beef" is a problematic culturally-rendered object that removes vital specificity of non-human life independent of its protein nourishment function for humans.
- ¹⁵³ While one could critique the fact that this image once again reinscribes a Western liberal consuming subject in its attachments, again, I would insist that this might be one of the most vital connections it makes. *If* such a subject is susceptible to what Bennett calls "considering revisions" in what matters in terms of lives and agencies, then the connection remains promising. The Hum-V, for example, that once might have been an icon of status for a consuming privileged subject, has been shut down as a brand of vehicles for sale to the public since 2010; this instance of the carbon footprint of shrimp in 2012 makes use of the lasting impression of a Hummer as a particularly contemptible and shameful icon of wealth and ecological destruction. I will further elaborate on the "return of the carbon subject" in a later section of this chapter.

¹⁵⁴ <http://www.gaalliance.org/about/>

¹⁵⁵ I am thinking here of social justice implications of up-rooting local livelihoods. Such concerns are not necessarily indexed by the carbon footprint metaphor, but they may be associated through the ecological footprint metaphor which indexes appropriation from distant spaces (ie Andrew Dobson's notion of "ecological debtors" as explained in Chapter Four through the notion of ecological/carbon citizenship)

¹⁵⁶ In 2011, the Taco Bell web-site features tells consumers to "drop the tux" at the high-end party and come to their fast-food chain to enjoy their succulent shrimp.
http://www.tacobell.com/Company/newsreleases/PACIFIC_SHRIMP_TACOS_2011, Accessed November 2, 2013

¹⁵⁷ See for example appeals to shrimp-eating consumers of the Global North to stop eating these from the people of coastal Bangladesh in the documentary *Murky Waters: Shrimp Farming in Bangladesh* (Swedish Society for Nature Conservation, 2011) <http://www.linktv.org/video/7119>

¹⁵⁸ Key nuances challenge the universalizing statement of partial "human" vision as a species-vision as I present it here; some people who live more proximally within the ecosystems have different sensibilities from living these relations, as will be discussed.

¹⁵⁹ See again the documentary *Murky Waters: Shrimp Farming in Bangladesh* (Swedish Society for Nature Conservation, 2011) <http://www.linktv.org/video/7119>

¹⁶⁰ "How Many Species on Earth" *Science Daily*, August 24, 2011 suggests that only 91% of marine species are known to humans. <http://www.sciencedaily.com/releases/2011/08/110823180459.htm> s

¹⁶¹ I am referring here to Derrida's controversial pronouncement "il n'y a pas hors-text" (There is no outside text), which may be interpreted as a gesture toward appreciating the multiple ways in which texts can be read and understood. Also key to this enigmatic statement may be the principal that notions like "outside" and "inside" are actually co-constituted and not separate. In a similar vein, my point here is that ecosystems, like texts may be interpreted and delineated in myriad ways and that mangroves deconstruct the inside and outside of the human-drawn boundaries of ecosystems.

¹⁶² Says the building company REID steel on its website: "it is not a good idea to cut down all the vegetation and produce a smooth unprotected beach. Mangrove swamps are particularly good at stopping Tsunamis...It is possible to design the walls so that they can fail at ground-to-first floor level, but the frames must be strong enough to support the floors above without help from the walls."
http://www.reidsteel.com/information/tsunami_resistant_building.htm#tsunamiresistantbuildings.

¹⁶³ <http://phys.org/news/2012-02-tiny-shrimp-giant-carbon-footprint.html> Retrieved March 1 2013. The AFP newsfeed from which this quote is extracted found its way to a number of other websites including "Sea Truth", the website based on the film by the same name in which overfishing is exposed as a major global disaster in the making <http://www.seathetruth.nl/en/2012/03/15/tiny-shrimp-leave-giant-carbon-footprint-scientist/> Retrieved March 1, 2013

¹⁶⁴ As reported in ScienceNOW, the publication that emerges from the Association for the Advancement of Science (AAS) to which Kauffman's findings were presented.
<http://news.sciencemag.org/sciencenow/2012/02/the-carbon-footprint-of-a-shrimp.html>

¹⁶⁵ Patrick Bond has used the term "carbon capital" in a critique of the "market-based false solutions" of the UNFCCC (2011, 3), but I am elaborating a specific version of carbon capital as it relates to Nicole Shukin's "animal capital." In other words, I am using Shukin's theorizations to suggest the ways in which non-human species affectively come to register as speculative market opportunities.

¹⁶⁶ While Betancourt's analysis is focused on the housing crisis of 2008, there are analogous claims to be made with regard to "carbon" as a speculative derivative. Although there are profoundly material relationships and effects involved in both the 2008 housing crisis and the carbon market, these material effects are distanced semiotically through asserting fungibility of assets, whether they are housing or carbon derivatives. The allotropism of metaphorical carbon helps in this semiotic abstraction.

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- ¹⁶⁷ “Carbon Colonialism” *Equity Watch: A Climate Newsletter from the South* Oct 25, 2000 <http://www.cseindia.org/content/carbon-colonialism> See also: Heidi Bachram “Climate Fraud and Carbon Colonialism: The New Trade in Greenhouse Gases” *Capitalism Nature Socialism* 15, 4 December 2004.
- ¹⁶⁸ “Carbon Trading: ETS, RIP?” *The Economist* April 20 2013. <http://www.economist.com/news/finance-and-economics/21576388-failure-reform-europes-carbon-market-will-reverberate-round-world-ets>
- ¹⁶⁹ The most-cited definition of “sustainable development” from “Our Common Future” (also known as the Brundtland Report) suggests “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (1987, 43).
- ¹⁷⁰ The Indigenous Environmental Network (IEN) and Bolivia’s president, Evo Morales refer to REDD and other such carbon trading schemes as “false solutions” <http://www.ienearth.org/exposing-redd-the-false-climate-solution/>
- ¹⁷¹ The Ocean Wise Moniker emerging from the Vancouver Aquarium is not without its limitations. Notably, it still names sea creatures as “seafood” for human consumption for often privileged carbon subjects who can afford this premium; thus the asymmetrical politics of over-consumption may not be addressed. In addition, the politics of the Ocean-Wise moniker are caught up in the politics “food re-localization” which, on the one hand, productively enables novel local material understandings and ecological practices; but on the other hand, ‘re-localization’ can also inaugurate forms of protectionism that create impacts and vulnerabilities for distant social and ecological relations based on existing dominant global regimes of agriculture and peoples.
- ¹⁷² “Cradle-to-grave”; “life cycle” analysis and “carbon footprint” all share certain attributes and are often taken as interchangeable. Though there are certainly discursive differences in the contexts in which they occur, I cannot here un-pack all of those in a comparative analysis; rather I keep my critical lens here focused on the differences in a plurality of carbon footprint metaphors themselves.
- ¹⁷³ McKay names the wilderness “the placeless place beyond the mind’s appropriations” (2002, 62).
- ¹⁷⁴ I am not suggesting the authority of all language be closed down simultaneously; as any text (including this one) demonstrates, this contingent authority is necessary to communicate anything at all.
- ¹⁷⁵ One example of this negotiation can be found within the stories of Athapaskan elders Angela Sidney, Kitty Smith and Annie Ned in Julie Cruikshank’s *Do Glaciers Listen?* (2006) The linguistic accounts of glaciers grant that these icy formations are living, inspirited sentient beings with the power to work with and against the people in their proximity.
- ¹⁷⁶ The way that Rees tells the story of this epiphany through his talk “Epiphany, Serendipity and the Genesis of Ecological Footprint Analysis” (2008) suggests a magical connection that began with a childhood moment in which he felt profoundly connected to the land. Sitting down to eat at his family’s farm, he realized that he had participated in the growing of everything on his plate and felt rooted and ecologically grounded through this – an insight that could only have been gained through the participation of the non-human in this experience.
- ¹⁷⁷ In his talk “Epiphany, Serendipity and the Genesis of the Ecological Footprint,” Rees connects the genesis of the ecological footprint in his own thoughts to a kind of eco-phenomenological awakening beginning on his grandparents’ farm.
- ¹⁷⁸ As cited in Chapter One, they imagine this dome in terms of the “Biosphere II” project in Arizona which sought to create a closed system like the planetary biosphere on a smaller scale (Wackernagel and Rees 1996, 10-11).
- ¹⁷⁹ In their foundational theorization of the ecological footprint, Wackernagel and Rees (1996) call the ecological footprint “an accounting tool,”⁽⁹⁾ a “concept” or “an analysis”⁽⁷⁾, but *not* a metaphor. In the one talk entitled “Epiphany, Serendipity and the Genesis of the Ecological Footprint,” Rees briefly mentions how the metaphor “was born,” but the ecological footprint’s metaphoricity is generally granted neither by its founders nor its elaborators/critics.
- ¹⁸⁰ Beef consumption in the U.S. is at an all-time low in the past 50 years <http://grist.org/list/2012-01-12-american-beef-consumption-is-at-a-50-year-low/>. Food commentator, Mark Bittman credits campaigns and

social movements like “meatless Monday” and “flexitarianism” for such reductions
http://opinionator.blogs.nytimes.com/2012/01/10/were-eating-less-meat-why/?_r=0

According to recent statistics, shrimp consumption is also down and consumers and retailers are demanding supply chains adhere to “sustainability” demands. http://www.intrafish.com/free_news/article1378688.ece

¹⁸¹ De Waal describes an oil company advertisement “that claimed its propane saved the environment.” In the advertisement, “a grizzly bear enjoying a pristine landscape had his arm around his mate’s shoulders. In fact, bears are nearsighted and do not form pair-bonds, so the image says more about our own behavior than theirs.” Such uses of anthropomorphism, he argues, “can provide insight only into human affairs and not into the affairs of animals” (1997).

¹⁸² See for example Jeffrey Moussaieff Masson and Susan McCarthy 1996. *When Elephants Weep: The Emotional Lives of Animals*. New York, NY: Dell Publishing.

¹⁸³ Notably, the morally-charged language on energy regimes is used not only by climate change “believers” who want to change energy regimes; such language is also used by climate change sceptic, Ezra Levant in his “ethical oil” thesis as I mentioned in Chapter Three.

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