THE DISCOURSE OF ADAPTATION

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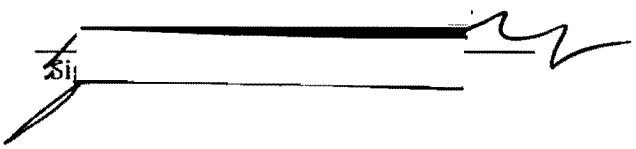

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Abstract

This research paper explores the discourse of municipal climate change adaptation in the context of planning. Dryzek's criteria are used which analyzes 4 dimensions of a discourse: basic entities; assumptions about natural relationships; agents and their motives; and, key metaphors and other rhetorical devices. Policies are analyzed from two municipalities in Canada: Toronto, Ontario and Halifax Regional Municipality. Analysis reveals climate change is assumed to already happening and requires action; a hierarchy of vulnerable "objects" including the city, citizens, ecosystems that need protection from a "subject" or the city; experts and government have the responsibility to educate the public; and rhetorical devices suggest urgency which can be used to reinforce a system of hierarchy that alienates citizens from the process.

Key Words: Climate Change, Adaptation, Environment, Planning

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Chapter 1: Introduction

What is Climate? Climate is the weather averaged in a specific location over a period of time (Halifax Regional Municipality, 2007, p. 2). Civilization is dependent on a degree of climatic certainty and stability and as a consequence, there are deeper cultural and historical meanings associated with it. Mike Hulme (2008) suggests that though its interpretations have evolved over time, climate has historically been associated with fear. In pre-modern times weather variations were beyond human understanding or control, and were therefore perceived to be an exercise of God's expression of favor or disfavor of morally vulnerable populations (ibid. 2008, p. 7). Pre-modern society ultimately was more concerned with variations in "weather" as opposed to "climate change" which tends to be at a much larger temporal scale. During the modern era, when Europeans increasingly encountered tropical climates, fear of climate was more associated with the dangers associated with tropical climates, as opposed to the variability of weather as a manifestation of climate (ibid. 2008). In the current era concern is of "climate change."

What is Climate Change? Climate change is the change in either a part of the earth or the entire earth's climate. Again, this definition is void of its political and cultural context. Through deeper analysis one would assert that there are two different types of climate change: the first happens overtime through natural processes; however, the discourse primarily focuses on how "climate change" has come to mean "anthropogenic climate change" which has also become synonymous with "global warming" (Hulme, 2008, p. 10). Non-anthropogenic climate change is perceived to be "natural" and therefore intervention is not justified. In response to the latter, numerous mitigation policies have been developed

which are anthropogenic interventions to reduce the sources or enhance the sinks of greenhouse gases (Banuri, et al., 2001, p. 716).

The significance of the two examples of "climate" and "climate change" is that it is no longer possible to address environmental issues in isolation of their political context. Meanings are ubiquitous and the way people think about basic concepts can vary within a population and change throughout time (Dryzek, 2005, p. 5). More importantly, though, interpretation directly affects policy and action (Gobster, 2005). For example, George Lakoff argues that environmental issues have lost public support over the years because of the way they have been framed (Butler, 2004). A cliché that has developed in the field of ecology that demonstrates the importance of framing is the language of "invasive" species which has integrated much militaristic and xenophobic metaphor and contributes to a literal war against such species (Gobster, 2005; Larson, 2005). These metaphors have been criticized for undermining the scientific objectivity of conservation objectives because of their resonance with the contemporary political setting (Larson, 2005). Furthermore, militaristic metaphor is contrary to the ideals of a sustainable relationship between humans and the natural world since they emphasize competition instead of mutual gains and collaboration (Larson, 2005).

Though planners stress the importance of communication and interpretation, for the most part they have responded concerns of rising temperatures, climactic extremes, and rising sea levels through design and physical planning solutions (Stone, 2005; Condon, 2008; Healey, 1992; Sharp & Richardson, 2001). This reality necessitates an alternative planning approach to climate change adaptation that emphasizes language as oppose to

physical planning. Such an approach should refrain from taking meaning for granted and shed light of a variety of perspectives on climate change. In addition, interpretation and discussion of the concept of climate change as oppose to its existence and possible design based responses should be at the core (Hajer & Versteeg, 2005, p. 176). These concerns can be addressed through discourse analysis, an approach that studies the use of language and assumes multiple realities which are socially constructed through communication (Dryzek, 2005; Coppola & Karis, 2000; Hajer & Versteeg, 2005; Cantrill & Oravec, 1996).

This research paper will explore the environmental discourses of municipal climate change adaptation planning. This purpose will be fulfilled through a three part process which includes a review of environmental discourse in the context of planning; the development of criteria for discourse analysis to assess policy; and the application of criteria to a selection of municipal climate change adaptation policies. The policies of analysis for this research paper will be Toronto, Ontario's "Ahead of the Storm" and Halifax Regional Municipality (HRM), Nova Scotia's "Climate SMART". Both of the communities being analyzed are waterfront communities in Canada and are expected to be by climate change and as such they have made considerable efforts through comprehensive planning to reduce and adapt to the negative impacts of climate change. Though other municipalities have taken steps to adapt as well, they are often single issue focused and do not take such a comprehensive approach. In addition, the municipalities that I have selected have been developing their climate change adaptation strategies over a significant time period and have published a large amount of information about their efforts which is necessary to conduct a meaningful policy analysis.

Chapter 2: Literature Review

Cities and Climate Change

In 2008 for the first time in human history half of the world's population had been living in urban settlements (United Nations Population Fund, 2007, p. 1). Though primarily occurring in Africa and Asia the trend of urbanization is expected to increase significantly over the 20th century at an unprecedented scale (United Nations Population Fund, 2007, p. 1). In addition to being home to half of the world's population cities consume large amounts of energy, and produce large amounts of waste, both of which contribute to global warming (Buckeley & Betsill, 2005). For these reasons it is becoming increasingly apparently that countries will be unable to respond to climate change without the cooperation of cities (Betsil, 2001; Buckeley & Betsill, 2005).

Sánchez-Rodríguez et al. (2005, p. 13) suggests that there are two dynamics at play when considering the relationship between urban areas and the environment: the negative effects that urban areas have on the environment, and the effects of global environmental changes on urban areas. Local authorities and urban planners have primarily addressed the former through mitigation by exerting authority over land-use planning, waste management, transportation issues and energy consumption in order to reduce resource inputs and emissions has been the primary mode by which municipalities have responded to climate change (Intergovernmental Panel on Climate Change, 2007, p. 818; Betsil, 2001). Harriet Buckeley and Michele Betsill (2005, p. 46) describe some of the traditional methods through which planners have responded to climate change:

- reducing the need to travel by developing the inner city, promoting mixed use developments, increasing housing densities
- reducing the number and length of motorized journeys by locating developments so that they are accessible by public transportation, cycling, and walking, abandoning minimum parking standards for new developments, and restricting lands for roads and parking
- designing for energy conservation by including energy conservation standards for buildings through design guidelines
- promoting the use of renewable energy by ensuring the use of combined heat and power in development proposals

Though mitigation of climate change has been a primary concern for municipalities, there have been many shortfalls associated with this approach. Some shortfalls of are as follows:

- Controlling local emissions will not protect a particular community from the effects of climate change, because effects of climate change occur at the global scale as oppose to the local (Betsil, 2001; DeAngelo & Harvey, 1998).
- Controlling emissions in one particular place will not have any measurable effect on the overall threat of global climate change. Rather, the effectiveness of mitigating climate change is dependent on a globally coordinated response, which has not historically been the case with other environmental issues (Betsil, 2001).
- It is becoming apparent that despite municipalities' best efforts to reduce Greenhouse Gas (GHG) emissions, climate change will still have impact municipalities. Global

temperatures will continue to escalate, climate extremes will still occur, and sea levels will still rise (Farber, 2007).

Climate Change Adaptation

Due to the shortfalls of mitigation, planners, policy makers, and local authorities have been paying more attention to the effects of global environmental changes on urban areas. Consequently, in addition to mitigation cities have begun to adapt as well – which are actions that reduce the negative impacts of climate change by adjusting policies and actions because of observed or expected changes in climate (Richardson, 2010). These new policies which demonstrate a more concrete connection between cause and effect, address many of the criticisms of mitigation. Ideally, in planning adaptation is meant to compliment mitigation rather than eliminate the need for or "trump" mitigation policies (City of Toronto and Clean Air Partnership, 2008, p. 1). The Intergovernmental Panel on Climate Change defines adaptation as an "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Intergovernmental Panel on Climate Change, 2001, p. 982). Based on this definition various types of adaptation have been identified (See Table 1: Categories of Adaptation)

Anticipatory Adaptation	Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
Autonomous Adaptation	Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
Planned Adaptation	Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

Private Adaptation	Adaptation that is initiated and implemented by individuals, households or private companies. Private adaptation is usually in the actor's rational self-interest.
Public Adaptation	Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.
Reactive Adaptation	Adaptation that takes place after impacts of climate change have been observed.

Table 1: Categories of Adaptation.
Adapted from "Climate Change 2001: Impacts, Adaptation and Vulnerability (Annex B: Glossary of Terms)" by Intergovernmental Panel on Climate Change.2001, IPCC Third Assessment Report - Climate Change: http://www.grida.no/climate/ipcc_tar/wg2/pdf/wg2TARannexB.pdf (p. 982)

Research on municipal climate change adaptation has primarily focused on how climactic conditions are changes and approaches that municipalities may take to adapt, reasons that policy changes are necessary, or case studies of projects that have been implemented. Such research has for the most part been void of the broader social implications of the meanings and interpretations of climate change adaptation. This report is an attempt to fulfill this gap through a discourse analysis of climate change adaptation policy.

Discourse Analysis and the Environment

Discourse analysis is the study of language-in-use (Hajer & Versteeg, 2005, p. 176; Wetherell, Taylor, & Yates, 2001). This tradition assumes that multiple, socially constructed realities exist as oppose to a single one governed by natural laws (Hajer & Versteeg, 2005, p. 176). As a method, discourse analysis takes a critical stance on 'truth' and emphasizes the communication through which knowledge is exchanged; and thus, tends not to be tends not to be scientific but looks towards the symbols and experiences that govern the way people think and act about an issue (Hajer & Versteeg, 2005, p. 176). The study of discourse is important in planning because there are a plurality of understandings and approaches that are used to remediate environmental problems; however, these approaches embody

power by ensuring that some are advanced, while others are suppressed and bad decision may result if if an approach is misguided (Dryzek, 2005, pp. 9,12; Coppola & Karis, 2000, p. xviii). Furthermore, environmental concepts related to climate change cannot be imposed, but are rather continuously contested and redefined in regard to meaning, interpretation and implementation (Hajer & Versteeg, 2005, p. 176). The study of discourse analyzes language to study meaning and interpretation of concepts.

Multiple approaches from many fields of disciples have been applied to the study of environmental discourse, some of which include political sciences, linguistics, history, and anthropology. For example, one common historical approach has been described by Robert Brulle in his book "Agency, Democracy, and Nature the U.S. Environmental Movement from a Critical Theory Perspective". Robert Brulle's approach to environmental discourse demonstrates the evolution of discourse through time. Drawing on discourses of the environmental movement Brulle (2000) demonstrates this evolution by describing nine categories of discourse: manifest destiny (exploitation and management of nature resources), wildlife management (the scientific management of ecosystems), conservation (maximizing utility and minimizing degradation), preservation (protecting wildlife from human intrusion), reform environmentalism (protecting ecosystems for human health), deep ecology (preserving diversity for intrinsic value), environmental justice (asserts the relationship between ecological problems and social inequity), ecofeminism (ecosystem abuse is related to patriarchy embedded in society), and ecotheology (humans have a duty to preserve nature because it is divinely created). An alternative model is Herndl and Brown's (1996) 'rhetorical model for environmental discourse' which is grounded in

anthropology. The authors use a triangle to illustrate three types of discourse. At each tips of the triangle are the classifications of three different types of discourse, as follows:

- Regulatory discourse –disseminated by powerful institutions that make decisions and set environmental policy, and treats nature like a resource
- Scientific discourse – nature is regarded as an object of knowledge that can be understood through the scientific method, and decisions are typically based on technical data and expert testimony
- Poetic discourse – based on narratives of nature that emphasize beauty, spirituality and emotional power

Unlike Brulle who describes discourse as an evolutionary process, the approach taken by Herndl and Brown is to recognize multiple discourses operating in society simultaneously, each of which are context dependent.

In addition to describing the spectrum of discourse within the environmental movement, others describe specific discourses. For example, there are a number of authors that describe postmodern perspectives in resolving environmental problems (Oelschlaeger, 1995; Glover, Postmodern Climate Change, 2006; Punter, 1988; Cosgrove, 1990). Two useful pieces that are relevant in the context of adaptation are Craig Calhoun's work (2004) *A World of Emergencies: Fear, Intervention, and the Limits of the Cosmopolitan Order* which describes how the term "emergency" is used as a term to refer to a range of catastrophes, conflicts, and settings for human suffering; and Mike Hulme's *The Conquering of Climate: Discourses of Fear and their Dissolution* (2008) which describes how the concept of climate has evolved but has always been associated with fear.

All the authors mentioned described the narratives associated with discourse rather than linguistics. The significance of the categories that were presented is that there are multiple approaches to categories and analyze environmental discourse. The above examples applied a historical lens to describe the evolution of discourse, an anthropological lens to describe the differentiation of discourse within a culture, and an analytical lens to describe how a specific environmental discourse describes a particular phenomenon. For planners, the study of discourse suggests that "the environment" as a concept should be taken for granted because there are multiple contested meanings. Furthermore, discourse analysis can contribute to reflexive practice since it allows planners to understanding underlying meanings and the social ramifications of policy choices (Sharp & Richardson, 2001).

Themes of Environmental Discourse Analysis

Since human social systems and ecological systems are both complex and environmental problems are found at the intersection of such systems, they are doubly complex (Dryzek, 2005, p. 9). Consequently, there are many environmental discourses and approaches to classifying them. Such approaches are not necessarily mutually exclusive, but have many overlapping qualities. Some common themes in discourse that have emerged which include: the contrasts of modernism and postmodernism; the extent that global limits exist and humankind's capacity to adapt to these imposed limits; and, where the burden lies in implementing environmental solutions.

Simplicity and Complexity: Modernism and Postmodernism

Climate change is an inevitable consequence of modernity because it is an outcome of an increase in the release of heat trapping gasses born out of industrial society; however, Leigh Glover (2006) argues that such an assertion is obvious since pre-modern societies did not possess the technological capacity to alter the global climate. Through a modern perspective, since the causes of climate change are directly related to fossil fuel consumption and greenhouse gas emissions associated with such consumption, curtailing emissions would resolve the problem (Glover, Climate change and modernity, 2006). Based on this assumption, acceptable levels of emissions are established which are developed by applying scientific knowledge to understand the relationship between greenhouse gas emissions and climate change and such emissions are regulated at the international level (Glover, Climate change and modernity, 2006). Glover suggests that there are three themes of modernism, as follows:

- "scientific knowledge as a means of understanding the natural and social worlds and the only reliable tool for their management;
- liberal-democratic (global) governance as the coalescence of capitalist economics and representative government; and
- managing the natural world for human ends" (Glover, Climate change and modernity, 2006, p. 3).

Recent trends indicate a development of an alternative to the modern style of environmental decision making towards a postmodern style. The concept of Post-Modernity lacks widespread consensus of its meaning: "it can be the outcome of modernity, the refusal of modernity, the latest stage of modernity, the remnants of modernity, a rejection of modernity, and so on" (Glover, Climate change and modernity, 2006, p. 36). Denis Cosgrove (1990), for example, asserts that though post-modernism implies a closure of a loosely-bounded historical Modern era, which originated in the European Renaissance

and the 'Scientific' Revolution', and spread capitalism, mechanical and biological technology and individualism, across the entire globe, this assumption does not necessarily describe post-modernism (p. 344). Practically speaking, such a time sensitive approach is not effective for the differentiation between 'modern' and 'postmodern' discourse, especially since all the examples to be described are quite recent, and would categorically be considered 'post-modern' through a time sensitive approach. Furthermore, there hasn't been a completely overhaul of modern ideals. For example, in contemporary society scientific methods and notions of linear causes and calculated measurable effects were not replaced with nuanced approaches in their entirety, but were in fact complemented by postmodern ones. Therefore, an alternative approach to describe post-modernism has been proposed by John Punter (1988), he states the following:

> "...[post-modernism]... does not describe a chronological period, nor something which merely comes after modernism, but a discourse which emanates from modernism and as a consequence of it. Post-modernism ... is characterised by the tensions between a reworking and a rejection of the ideas of the modern movement" (p.22).

In addition to the time sensitive "epoch" differentiation, John Punter (1988) argues for other defining characteristics of Post-Modernism as well including, method, style, as well as ideology which includes reactionary and progressive post-modernism (see Table 2: Classifications of Post-Modernism).

Post Modernism as epoch	- Emphasizes a defined period or point in time that separates modern from post-modern - Authors usually place the breaking point in the 1960s to the 1970s
Post-Modernism as method	- Eclectic use of method/mixed media production - Closing the gap between 'art' and 'mass culture' - Multitude of meanings
Post-Modernism as Style	- Contextual style that alludes to points in time and space
Reactionary Post-Modernism	- Reacts against the tenants of modernism - Examples include feminism, homosexual rights, and

		community and minority arts
Progressive Post-Modernism	-	Attempts to further the creative freedoms of modernism

Table 2: Classifications of Post-Modernism
Based on "Post-Modernism" by J. Punter, 1988, Planning Practice and Research , 2(4), 22-28.

Mitigation efforts which propose a modernist scientific cause and effect approach to reduce global greenhouse emissions have for the most part been unsuccessful since emissions continue to increase (Glover, Climate change and modernity, 2006). Adaptation as a concept is a symbol of the ineptness of modern reductionist science to solve complex environmental issues such as climate change, and poses the need for holistic ones that consider the broader human and ecological environment in which they manifest (Glover, Climate change and modernity, 2006, p. 3). In regard to climate change, the postmodern approach rejects reductionist science as a tool to inform policy in a liberal democratic society because there is a great variety of values and interests at stake (Glover, Conclusion, 2006, p. 251). Consequently, an issue of importance is determining how to balance the interests of states, corporations, and civil society (Glover, Conclusion, 2006, p. 251). Within the postmodern perspective, one approach to understanding environmental has emerged - "political ecology". Baikie and Brookfield (1987) defines political ecology as: 'The phrase ... [that]... combines the concerns of ecology and a broadly defined political economy" (p.17). Accordingly, through a political ecological perspective emphasis is no longer on the ecological problem in itself, but the on the role of the political economy as a force of mal-adaptation that perpetuates the problem (Walker, 2005, p. 74).

A similar but alternative postmodern perspective had also emerged at the same time as political ecology called "complex systems theory" (also known as "systems theory"). Consistent with political ecology, systems theory recognizes the external forces at play in

influencing ecosystem dynamics; however, emphasis is shifted towards adaptation and homeostasis (Walker, 2005, pp. 73-82). C.S. Holling (2001) is among the significant proponents of this discourse, and he argues that ecosystems are dynamic and it is important to "embrace uncertainty and unpredictably" (p.391). Unfortunately, this emphasis on uncertainty can and has been used as an argument against environmental and climate change action. For example Jeffery E. Foss's (2009) argues against some environmentally related causes such climate change by suggesting that they are too complex and chaotic to understand.

Post-modern approaches can be reformist or radical. Whereas, reformist traditions tend to maintain the discourse of industrial society by upholding a commitment to growth in the quantity of goods and services produced, radical traditions propose the replacement of industrial society (Dryzek, 2005, pp. 13-14). Sustainable Development, a discourse popularized in by the Brundtland Commission Report, Our Common Future and is defined as "humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" can be considered a reformist approach that has underpinnings of "post-modernism" (World Commission on Environment and Development , 1987). Emphasis on public participation as oppose to technocratic and scientific reasoning is what makes sustainable development postmodern, and though there are many models of sustainable development, for the most part it usually does not entail radical divergence from modern industrial society but incremental changes.

At the opposite end of the spectrum of postmodern critiques is the Green Radicalism which argues fundamental change is warranted to make the necessary changes to move forward in climate change adaptation. Though they are diverse (see Table 3: Green Radical Critiques), the underlying narrative of Green Radicalism is that "industrial society induces a warped conception of a person and their place in the world" (Dryzek, 2005, p. 193).

Deep Ecology	- Basic principles are self-realization and biocentric equality - Humans are part of a larger system and do not have greater value than others - The root of environmental problems is anthropocentrism
Ecofeminism	- Root of environmental problems is male domination of women and nature alike - The root of environmental problems is androcentricism
Bioregionalism	- Seeks the rehabilitation of places in which people live - Political boundaries should match ecological boundaries
Ecological Citizenship	- People should become respectful citizens in an ecological place rather than transforming the place to suit themselves
Lifestyle Greens	- Being green involves living a green lifestyle
Eco-Theology	- Eco-theologians diagnose the root of environmental problems in spiritual terms

Table 3: Green Radical Critiques
Based on The politics of the Earth(pp. 183-202), by J. Dryzek, 2005, Oxford, Oxford University Press.

Global Limits: Survivalism, Prometheanism and Cornucopianism

Survival, Promethean and Cornucopian arguments answer the most fundamental contemporary environmental questions: What are the limits on global resources, if they even exist? How will humankind adapt to such resource constraints? Traditionally, survivalism as an environmental discourse has been used to suggest that looming tragedy as humankind draws nearer and eventually surpasses its "carrying capacity" (Dryzek, 2005, p. 27; Hardin, Living Within Limits: Ecology, Economics, and Population Taboos, 1993, p. 207). There have been many works that have been influenced by this discourse; however, some of the classics that illustrate the diversity of literature are as follows:

- Garret Hardin's (1968) "Tragedy of the Commons" in which he argues that multiple individuals, acting independently and rationally will act on behalf of their own self-interest, and inevitably deplete a shared but limited resource
- The Limits to Growth study commissioned by the Club of Rome which used computer modeling to model the consequences of a rapidly growing world population and finite resource supplies, and portrayed a world with an exploding population that would use resource to exhaustion and pollute till it chocked (Meadows, Meadows, Randers, & Behrens III, 1972; Dryzek, 2005, p. 31)
- Thomas Homer-Dixon's (1999) "Environment, Scarcity and Violence" and Thomas Homer-Dixon's and Jessica Blitt's "Ecoviolence: Links Among Environment, Population, and Security" (1998) in which the authors describe how environmental scarcity in the developing world can lead to violence, as groups struggle over depleting resources

The problem of climate change presents a unique challenge due to increased uncertainty associated with it. More specifically, whereas classic survivalist works describe the depletion of a scarce resource, in the context of climate change the topic of interest is the point at which a functioning complex self-regulating system reaches a threshold in which it becomes dysfunctional (Gunderson, Holling, Pitchard, & Peterson, 2002; Groffman, et al., 2006; Holling, 2001). In climate change research negative and positive feedback loops have been used to explain this phenomenon. Negative feedback is a state of homeostasis in which feedback counteracts a process. In the context of global warming, increased carbon sequestration through photosynthesis would counterbalance the impacts of anthropogenic carbon emissions. However, it is expected that as the earth warms, eventually the rate of decomposition will surpass the rate of photosynthesis, and a

consequence of this reality is a positive feedback loop which will cause ecosystems to accelerate the rate of global warming rather than counterbalance it (Heimann & Reichstein, 2008; Scheffer, Brovkin, & Cox, 2006). Martin Heimann and Markus Reichstein (2008) illustrates this "threshold" and argue that though carbon sequestration was heightened during the industrial expansion of the nineteenth and twentieth century, in the future, it will decrease as the earth warms due to a greater increase in decomposition by fungi and respiration by animal and bacterial life in the soil than plant photosynthesis. Survivalists thus argue that inevitably anthropogenic impacts will reach a critical threshold in which the biosphere will no longer be able to provide negative feedbacks to rising CO_2 emissions and increased temperatures.

There are two perspectives that oppose Survivalism discourse: Cornucopianism and Prometheanism (Dryzek, 2005). Cornucopian, which means abundant natural supply denies environmental limits; this perspective asserts unlimited natural resources, unlimited ability of natural systems to absorb pollutants, and unlimited corrective capacity of natural systems (Dryzek, 2005, p. 51). Cornucopians argue that the carbon emissions and global warming is subject to controversy and uncertainty in regard to the extent of buildup, causes and effects (Simon & Kahn, 1984; Foss, 2009, p. 121). For the most part, those that oppose Survivalism discourse do not necessarily subscribe to the "Cornucopian" tradition and deny environmental limits, but are in fact Prometheans (name taken from Greek mythology, where Prometheus stole fire from Zeus, and vastly increased the human capacity to manipulate the world, *see* Dryzek [2005, p. 51]) and believe that humans have the infinite capacity to adapt to environmental constraints. For example, Promethean's may

justify the use of nuclear power to reduce Greenhouse Gas Emissions (Simon & Kahn, 1984).

Solving Problems: Administrative Rationalism, Democratic Pragmatism and Economic Rationalism

There are three general discourses that describe the agents necessary to solve environmental problems: Economic Rationalism, Administrative Rationalism, and Democratic Pragmatism (Dryzek, 2005). These discourses suggest different process of coordinating environmental efforts, whether through the market, bureaucracy or democracy (Dryzek, 2005, p. 73). For the most part, these discourses focus on short-term issues and are "agnostic about global limits" (Dryzek, 2005, p. 143).

Proponents of economic rationalism argue that market based instruments should be implemented to reduce pollution. The context and challenge for economic rationalists is often linked to Garret Hardin's (1968) Tragedy of the Common's. Whereas, the issue is the depletion of publically shared resources, the solution for many economic rationalists is privatization and the rational for this solution is justified because people care more for what they hold privately than for what they hold in common with others (Dryzek, 2005, p. 123). For this reason, most of the market mechanisms that promote environmental protection in some way privatize the use of a resource. Robert Stavins and Whitehead Bradley (1997) discuss these mechanisms which include the following:

- Pollution charge systems – A fee or tax is set on the amount of pollution that a company or product generates.

- Tradable permits – A target is set of how much pollution should be allowed in an industry, area, or state, and then companies generating the pollution receive permits either through distribution or auction allowing them to share the total. Companies can then sell their surplus permits to other firms to offset excess emissions.
- Deposit refund Systems – Consumers pay a surcharge when they purchase potentially polluting products, and get a refund when the product is returned for recycling or proper disposal.
- Reducing market barriers – Measures that make it easier to exchange commodities can be implemented, such as water rights which allow for more equitable distribution.
- Eliminating government subsidies – Government subsidizes can result in over consumption and wasteful use of resources.
- Providing public information – Information allows consumers to make more informed decisions and creates incentives for environmental care in companies.

Economic rationalism does have its drawbacks, however. Dryzek (2005) argues that there are citizen and consumer preferences (p.139). For example, as a consumer a person may wish to make use of a freeway to get to work quicker, but as a citizen the same person may oppose the freeway due to its detrimental environmental impacts (Dryzek, 2005, p. 139). Economic Rationalism only considers the former.

Therefore, a second approach to resolving environmental problems is administrative rationalism. This approach is defined as a "problem-solving discourse which emphasizes the role of the expert rather than the citizen or producer/consumer in social problem solving, and which stresses social relationships of hierarchy rather than equality

or competition (Dryzek, 2005, p. 75). Proponents argue that environment issues are complex and require a "nexus of science, professional administration, and bureaucratic structure" (Dryzek, 2005, p. 75). Much mitigation policy approaches climate change through an integrated economic and administrative "expert" based framework. This reality is due to the nature of the problem. Climate change is a global level "Tragedy of the Commons" scenario. More specifically, local responses generate global impacts, and democratic decision making is highly inefficient at the global level. Nonetheless, as Dryzek notes, "administrative rationalism is not very popular as an ideal; rather, it is just what a lot of people, and a lot of institutions, actually end up doing – even the people doing it rarely admit to liking it" (Dryzek, 2005, p. 99).

Democratic pragmatism is a much more popular approach that contrasts administrative rationalism. According to democratic pragmatists, knowledge related to problems of complexity cannot be centralized in the hands of any administrative state structure or expert but require many voices and perspectives (Dryzek, 2005). A classic article from this perspective that is often cited within in the planning field is Sherry R. Arnstein's article, a Ladder of Citizen Participation (1969). Arstein argues, citizen participation is citizen power; however, citizen power can often be more so ritualistic than real. An eight rung ladder is used as a metaphor to describe the different levels of participation. The ladder has three groups of rungs: nonparticipation, tokenism, and citizen power (Arnstein, 1969). The lower grouping of nonparticipation includes manipulation and therapy and enables power holders to educate or cure participants rather than truly engage them (Arnstein, 1969). The middle level rungs are considered to be tokenism and include informing, consultation and placation, and at these levels though citizens may be

aware of the decision making and be heard, they do not have the power to insure their views will be heeded by the powerful (Arnstein, 1969). Partnership, delegated power and citizen control are grouped at the top of the ladder under citizen power, and at this level citizens maintain a majority of the decision making seats or full managerial power (Arnstein, 1969).

Planning and Discourses of the Environment

Discourse is a subtle element of policy, and planners tend not to be conscience of how it affects their practice. Nonetheless, the study of discourse is important because it answers questions such as "Who is responsible? What can be done? What should be done?" (Hajer M. A., 1993, p. 45). In addition, adherents of a discourse may use it to impose their views of reality on others through debate or persuasion (Hajer M. A., 1993). Typically, planners rest their arguments on more than one discourse at a time (Hajer M. A., 1993). For example, in a single plan a planner use the discourse of survivalism or fear to justify the need to act on climate change, economic discourse to compare the costs of adaptation to no inaction, and administrative discourse to describe the role of political institutions in a plans implementation.

Dryzek's Approach to Environmental Discourse Analysis

Drzyek interprets discourse as "a shared way of apprehending the world" the affects of which allow subscribers to interpret information, create meaning, as well as define common sense and legitimacy in knowledge (Dryzek, 2005, p. 9). His approach to discourse analysis has been influenced by the work of Michel Foucault, a French philosopher that applied the concepts of discourse to the social sciences. Foucauldians for the most part

believe that individuals are subject to the discourses that manifest and that one single discourse is dominant in any single given time and place (Dryzek, 2005, p. 22). One of the benefits and ways that Dryzek's approach differs from Foucauldian perspective is that Dryzek opposes the view of discourses as hegemonic and replaces it with a pluralistic one that assumes that discourses "compete, collaborate, or converge within contemporary politics and policy making" (Prelli & Winters, 2009, p. 225). The pluralistic approach as proposed by Dryzek maintains a perspective that discourses embody power but he attempts to distinguish between the ways different discourses are used to exert power (Prelli & Winters, 2009, p. 225; Dryzek, 2005, p. 22).

This pluralistic perspective is applied in Dyzek's categorization of environmental discourses. He describes the different types of discourses on four squares on the basis of whether they attempt to reform society or apply radical change, and offer a prosaic or an imaginative response (see figure 1: Dryzek's Categorization of Environmental Discourses). The discourses that he identifies include survivalism, problem solving, sustainability and green radicalism (Dryzek, 2005, p. 15). The contrasts and similarities between the discourses are portrayed when Dryzek further breaks down his four generic categories into Survivalism, The Promethean Response (and Cornucopian Response), Administrative Rationalism, Democratic Pragmatism, Economic Rationalism, Sustainable Development, Ecological Modernization, Green Consciousness, and Green Politics. This perspective can be applied to climate change policy as well, since though climate change adaptation may operate alongside in policy and discussion and share common elements with mitigation and other environmental discourses, there are instance in which it will compete. Though it is not my intention to compare and contrast the discourses of adaptation with other

environmental or climate change discourses, this perspective suggests that climate change adaptation has unique assumptions which justifies its study.

	Reformist	Radical
Prosaic	Problem Solving	Survivalism
Imaginative	Sustainability	Green Radicalism

Figure 1: Dryzek's Categorization of Environmental Discourses
Adapted from The politics of the Earth(p. 15), by J. Dryzek, 2005, Oxford, Oxford University Press.

According to Dryzek it is not enough to recognize that discourses exist, but there should be a method to study them in order to understand "how these discourses have developed, and to what effect" (Dryzek, 2005, p. 17). His approach frames discourses as an abbreviated story line which are constructed from four elements (see Table 4: Dimensions of Analyzing Environmental Discourse). This approach is differs from a linguistic approach since it analyzes the broader narrative as oppose to studying the phonology, grammar, sentences, vocabulary and semantics (Fairclough, 1992).

1. basic entities whose existence is recognized or constructed -	ontology of a discourse or what is recognized to be real or existing
2. assumptions about natural relationships -	describes the interactions of components and actors in climate change adaptation
3. agents and their motives -	agents are normally humans but can be non-human as well
4. key metaphors and other rhetorical devices -	rhetorical devices deployed to convince listeners or readers by putting a situation in a particular light

Table 4: Dimensions of Analyzing Discourse
Based on The politics of the Earth(pp. 16-22), by J. Dryzek, 2005, Oxford, Oxford University Press.

Chapter 3: Approach

Using Dryzek's (2005) 4 dimensions of environmental discourse (basic entities whose existence is recognized or constructed; assumptions about natural relationships; agents and their motives; and, key metaphors and other rhetorical devices) I analyzed climate change adaptation policies which included Toronto, Ontario's "Ahead of the Storm" and Halifax Regional Municipality (HRM), Nova Scotia's "Climate SMART". My process involved a review the policy documents in their entirety and a selective scanning of key words and phrases. The selection of key words and phrases was then compared to the ways they have been used in different contexts in order to note underlying meanings and connotations associated with them.

The reason I have selected Toronto and HRM is because with the exception of these two cities there are few examples of comprehensive climate change adaptation initiatives, which means that Toronto and HRM may be a a model that planners apply in their plans to adapt to climate change. Though other municipalities have acted, they have avoided planning for climate change adaptation in the broad sense, but implemented single issues based projects and plans related to storm water management, tree survival initiatives, neighbourhood retrofitting or wildfire protection. A second reason that Toronto and HRM are ideal for analysis is because they have published detailed plans and supporting documents about their efforts. For Toronto such documents included its climate change, clean air, and sustainable energy action plan and "Ahead of the Storm... Preparing Toronto for Climate Change" and for HRM a climate change risk management strategy, a community action guide to climate change and emergency preparedness, and a developer's risk management guide.

Toronto, Ontario: Ahead of the Storm

Toronto is the largest of the two municipalities by population that has been selected for study, and as of 2006 had a population of 2,503,281 (Statistics Canada, 2007). The city is situated at the northwestern shore of Lake Ontario and is part of both a greater metropolitan area with over 5 million residents, and a densely populated region in Southern Ontario known as the Golden Horseshoe which is home to approximately 25% of Canada's population (Statistics Canada, 2007; Statistics Canada, 2007). Climate change adaptation had come to be seen as a necessity because the city had been increasingly subject to extreme heat, floods, drought, new insect pests, as well as the onset of new vector-borne diseases including West Nile Virus and Lime disease (City of Toronto and Clean Air Partnership, 2008, pp. 6,8). Consequently, as a first step to climate change adaptation, the city introduced Toronto's climate change plan – "Climate Change, Clean Air and Sustainable Energy Action Plan" which was adopted by City Council on July 2007. Though this plan was primarily concerned with mitigation, it recognized the importance of adaptation as well and was thus a precursor to climate change adaptation in the City (City of Toronto, 2007).

A year later a second document titled "Ahead of the Storm... Preparing Toronto for Climate Change" was prepared by the Toronto Environment Office in collaboration with the City of Toronto Climate Adaptation Steering Group and Clean Air Partnership (an environmental group that works to improve air quality and tackle climate change) and was unanimously endorsed by council in July, 2008 (City of Toronto and Clean Air Partnership, 2008). Though the authors recognized that mitigation was necessary, the focus was

specifically on preparing for climate change (City of Toronto and Clean Air Partnership, 2008, p. 5). The goals of the document were to:

- "Provide a rationale for incorporating adaptation to climate change into City of Toronto policies, programs and activities;
- Build on existing partnerships to engage the City urban area, comprising small and large businesses, residents and other stakeholders, in actions to provide protection from climate change;
- Describe programs and actions already underway in the City that provide protection from climate change;
- Suggest further short-term actions that will increase protection from climate change and provide other benefits to Toronto; and
- Recommend a process to systematically assess the risks to Toronto of climate change, prioritize areas for action, and develop strategies to reduce the impacts and protect Toronto" (City of Toronto and Clean Air Partnership, 2008, p. 5).

The report included a diverse list of existing programs that reduced vulnerability and increased the cities "adaptive capacity" in the wake of climate change. Initiatives that had been identified included: Toronto's Heat Alert system and Hot Weather Response Plan; the Wet Weather Flow Master Plan to reduce flooding from intense rainfall; the Basement Flooding Protection Subsidy Program; flood warning forecasting; the Green Roof Pilot Incentive Program; a commitment to double the tree canopy; the Deep Lake Water Cooling (Enwave), Peaksaver and Keep Cool Programs; the Green Development Standard for new developments; green parking lot design guidelines; the Better Buildings Partnership to increase energy efficiency of new buildings; Toronto's Emergency Plan which prepares the city in the face of hazards that may occur in the wake of climate change (City of Toronto and Clean Air Partnership, 2008, p. 16). In addition to identifying adaptation initiatives currently underway, the report listed a number of planned and proposed adaptation actions which were equally diverse, many of which increased the capacities or improved upon existing programs. Last, the document created a scheduled plan of action to develop and monitor a longer term comprehensive adaptation strategy for the city.

Halifax, Nova Scotia: Climate SMART

HRM is a coastal municipality situated adjacent to the Atlantic Ocean. Based on 2006 data, HRM had a population of 372,679, making it the largest municipality in Atlantic Canada, and encompassing 40% of the population of Nova Scotia (Statistics Canada, 2007). Though the municipality is very large, covering 5,577 square kilometers, it has a diverse range of land uses and encompasses many distinct smaller communities including seaside villages, rural and farming communities, suburban neighbourhoods and communities and urban centres under the government (Halifax Regional Municipality, 2006). The municipal climate adaptation strategy was initiated when select companies from ClimAdapt, an inter-agency collaboration which now includes private sector firms, non-governmental organizations, and support from three levels of government approached the municipality to see what could be done about the impacts of climate change (Halifax Regional Municipality, 2010; ClimAdapt, 2007). In response, the municipal government formed an action plan steering committee which included municipal staff and representatives from the private sector to develop the Climate SMART (Sustainable Mitigation and Adaptation Risk Toolkit) model, as well as an informal working group of federal, provincial and municipal officials (Halifax Regional Municipality, 2010). The goal of Climate SMART is "to develop management and planning tools to prepare for climate change impacts, and to develop strategies to reduce practices that contribute to global warming in the first place - primarily by reducing greenhouse gas emissions" (Halifax Regional Municipality, 2006).

One of the significant adaptation documents they had produced was the "HRM Climate SMART Community Action Guide to Climate Change and Emergency Preparedness" (Halifax Regional Municipality, 2006). The role of the document was to complement

existing Provincial and Municipal disaster preparedness and response resources (Halifax Regional Municipality, 2006, p. 2). The guide was not exclusively for adaptation, as the goals of it were to:

- provide information on climate change and its risks;
- suggest actions that can be taken to reduce greenhouse gas emissions that cause climate change;
- provide the knowledge and the tools to help us organize our neighbourhoods to prepare for extreme weather events; and
- help develop a Climate SMART Community Action Plan (Halifax Regional Municipality, 2006, p. 2).

One of the key contributions of the Community Action Guide was a step-by-step guide to help communities cope with changing climate conditions (Halifax Regional Municipality, 2006, p. 11). These steps were as follows:

- Step 1: "Be aware of how your community may be at risk from climate change" by understanding the impacts of past emergencies and associated with natural weather events, as well as knowing climate change projections and expected extreme weather.
- Step 2: "Know your vulnerabilities and your resources" which entails knowing whether there are specific residents, buildings, facilities, or environments that that are especially vulnerable to weather emergencies and hazards, as well as knowing people, places and things that can be used to both prepare for and respond to emergencies.
- Step 3: "Minimize risks through adaptation actions" by being aware of environmental conditions and taking preventative actions to prepare for various events.

- Step 4: "Prepare a Climate SMART Community Action Plan" to plan what the community will do to prepare for and respond to climate related emergencies.
- Step 5: "Publicize test & evaluate the Action Plan" by informing and providing information to the community about the plan, and hold realistic emergency simulations.

The following year Climate SMART produced two other adaptation related documents: "Climate Change: Developer's Risk Management Guide" and "Climate Change Risk Management Strategy" (Halifax Regional Municipality, 2007). Both had the purpose of identifying potential hazards to development related to climate change and describing an approach to addressing them (Halifax Regional Municipality, 2007, p. 4). The former however, was specifically catered to the development industry and provided an overview of climate change, a step by step approach to assessing risk, and a checklist that could be used in the planning and evaluating of development proposals, as well as described the predicted impacts of climate change on HRM (Halifax Regional Municipality, 2007, p. 2). This document was much more detailed than the Community Action Guide and provided a broader range of climate impacts including those related to ecological and human health as well. The latter document, the "Climate Change Risk Management Strategy" identified how increase in temperature, sea-level rise, extreme events and increased storm surge elevations would HRM's biophysical and socioeconomic fabric (Halifax Regional Municipality, 2007, p. 48). Such biophysical and socio-economic impacts included those that affected coastal zones; communities, infrastructure, and transportation; water resources; human health; fisheries and marine resources; forestry; agriculture; and environment.

Chapter 4: Analysis

Dimension 1: Basic entities whose existence is recognized or constructed

By definition adaptation assumes that there is a change in natural systems, and such change requires a response. For the most part, such change is perceived to be undesirable and will entail both increased "frequency and severity of heatwaves, droughts, bush fires, tropical cyclones, tornadoes, hailstorms, floods, and storm surges" (Halifax Regional Municipality, 2007, p. i). A part of the assumption is that climate change is already happening will have direct impacts onto cities into the future, and thus requires action (City of Toronto and Clean Air Partnership, 2008, p. 5; Halifax Regional Municipality, 2007, p. 32; Halifax Regional Municipality, 2006, p. 1). Consequently, the discourse maintains a sense of vulnerability for all actors both natural and human. Proponents thus argue that it is essential that adaptation become a part of discussion for "public safety and security" (Halifax Regional Municipality, 2007).

Dimension 2: Assumptions about natural relationships

One of the claims of the report by the City of Toronto and Clean Air Partnership is as follows: "The need to adapt to climate change – to protect the city, its citizens, its ecosystems and its economy from the negative impacts of global warming – was identified in the Climate Change Action Plan as a matter of growing urgency" (City of Toronto and Clean Air Partnership, 2008, p. 6). The claim implies a system of hierarchy in which there are vulnerable "objects" which include the city, citizens, ecosystems that need protection from a "subject" – which has been described as the "City" (*the City* in this plan refers to government agencies within the city). These assumptions are similar to Dryzek's (2005) discourse of "administrative rationalism" which suggests that nature is subordinate to

human problem solving, people are subordinate to the state, and experts and managers control the state (pp. 87-89). Expert-based decision making is further reflected in Clean Air Partnerships strategy of engagement strategy found in Step 2 of *Developing a Comprehensive Adaptation Strategy"* (City of Toronto and Clean Air Partnership, 2008, pp. 27-29). Though the plan suggests that citizens should have the opportunity "to be involved in and contribute to the adaptation process through public meetings, commentary on web boards and other mechanisms", and there is mention of specific stakeholders that should be engaged including organizations that support vulnerable populations including refugees, seniors, the homeless and low income; the document is ambiguous in regard to how these groups shall be involved in the decision making process (City of Toronto and Clean Air Partnership, 2008, p. 28). In contrast, the report is specific about the actions that citizens could undertake in adapting to climate change, which include:

- reducing consumption of water and energy;
- making private walkways and driveways from permeable materials;
- participating in the planting and care of trees in their neighbourhoods;
- participating in community stewardship organizations to enhance local parks and orphan spaces;
- ensuring homes can resist flooding by installing backflow valves and sloping the ground away from the house; and
- keeping a 3-day emergency kit on hand in case of blackouts or weather emergencies.

Reflecting on Arnstein's (1969) Ladder of Participation, the City of Toronto's Plan reflects tokenism and information sharing as opposed to 'true' empowerment and

participation because citizens are being advised on the actions that they should undertake rather than being involved in actual decision making. This reality may not necessarily be intentional, but an outcome of making decisions and adapting under the complexity of both ecological and human social systems (Dryzek, 2005, pp. 9, 99). Essentially, though Toronto adaptation planning recognizes the need for engagement, it is unclear the extent to which the public's contributions will influence the process.

The coordination of climate change adaptation projects of Climate SMART in HRM differs from Toronto because it includes a larger range of contributors and partners including local community groups and businesses (Halifax Regional Municipality, 2010). This reality does not necessarily signify "democratic" decision making, however, since it may not be reflect the diversity of the population by being inclusive to only "spokespersons". With the exception of describing current partnerships, there is no mention of developing partnerships or maintaining continued dialogue with the community in any of the plans. For the most part, the plans of Climate SMART reflect an expert model to decision making. For example, *HRM Climate SMART Community Action Guide to Climate Change and Emergency Preparedness* describes a number of initiatives that the communities could undertake to protect themselves from the impacts of climate change, but does not describe how much communities could impact climate change adaptation initiatives at the municipal scale. However, the two documents that best illustrate the expert approach to decision making are the *Climate Change: Developer's Risk Management Guide* and *the Climate Change Risk Management Strategy.* This approach is especially evident in the Developers Risk Management Guide and the Climate Change Risk Management Strategy that for the most part alienate citizens from the process in their

entirety (see Table 5: Developers Risk Management Guide and Climate Change Risk Management Strategy Approach).

Developers Risk Management Guide		Climate Change Risk Management Strategy	
Step		Step	
1	Setting The Context	1	Understand the Context
2	Analyzing the Hazard	2	Identify Climate Change Impacts
3	Estimating the Risk	3	Identify, Quantify and Qualify the Risks
4	Evaluating the Risk	4	Prioritize the Risks
5	Adaptation And Risk Control	5	Identify the Options to Manage the Risks
6	Implementation And Monitoring	6	Identify the Resources, Barriers and Timeframes

Table 5: Developers Risk Management Guide and Climate Change Risk Management Strategy Approach

Dimension 3: Agents and their motives

Municipal climate change adaptation policy portrays three general categories of actors: experts, citizens and ecosystems. For the most part, experts include policy makers and climate scientists. Experts are supposed to take an active role by creating and implementing policies and plans, and distributing information to the citizens about climate change. Citizens are for the most part excluded from the decision making process but are expected to abide by expert based decisions. This ideology is manifested in both Toronto's *Ahead of the Storm* and Halifax's Community Action Guide for Climate Change which inform the public of steps they can take to adapt to climate change but does not address how they may participate in the community engagement process. Though both Toronto and HRM claim to engage the public in community engagement, the extent to which the general public can influence policy is difficult to determine based on policies of analysis. Subordinate to experts and citizens are ecosystems which in adaptation planning lack agency but are considered valuable resources that must be protected (City of Toronto and

Clean Air Partnership, 2008, p. 6). Climate is one of the subcategories of ecosystems, but is presented as an antagonist which all actors including experts, citizens, and ecosystems need protection from through planning.

Dimension 4: Key metaphors and other rhetorical devices

There were many politicized phrases that have come up in the climate change adaptation strategies of the City of Toronto and HRM, some of which are as follows:

"Adaptation"	This term has been re-appropriated to describe preparatory/planned, in addition to the traditional response type of adaptation (Halifax Regional Municipality, 2007, p. 20). Climate change adaptation tends to be primarily deliberate and planned.
"Global Warming"	The term global warming has been used synonymously with climate change (Hulme, 2008, p. 10).
"Safety and security"	This phrase has been found primarily in the Climate Change Risk Management Strategy for HRM (Halifax Regional Municipality, 2007, pp. ii,1,3). Safety and security is often associated with terrorism, and may ultimately be used justify the expropriation of human rights to protect the public interest (Roach, 2006).
"Storm"	This word is a metaphor used by the City of Toronto in their climate change adaptation planning (City of Toronto and Clean Air Partnership, 2008). Storm implies violent weather conditions, a commotion, or disturbance. Furthermore, storms often happen quite rapidly, with unpredictable and possibly catastrophic

		impacts. Nonetheless, society often prepares for approaching storms.
"Vulnerability Risk"	*vs.*	Both terms have been used in the adaptation policies under analysis. "Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, the sensitivity and adaptive capacity of that system" (Intergovernmental Panel on Climate Change, 2007, p. 6). Vulnerability usually refers to the potential hazards such as erosion, sea level rise, storm surges, heat waves and other extreme events. Risk refers to the probability that such an event would occur.

Reflections and Limitations

The approach to discourse analysis presented in this study has many benefits, the first of which is that it looks at discourse beyond analysis of a communicative exchange, but extends into the realms of "ideology, strategy, language and practice" which are shaped by "power and knowledge" (Sharp & Richardson, 2001, p. 195). A second benefit of this approach is that since the unit of analysis is beyond words and sentence structure it is possible to analyze large amounts of text.

It is important to note that there are limitations of the analysis. First, since analysis of the policy documents is based on an interpretation there is inevitably a degree of

researcher subjectivity. Second, since there have not been many municipalities in Canada that have developed public and comprehensive adaptation plans there was a limited number of policies to choose from and other municipalities that are in the process of developing strategies may approach adaptation differently. In part, the reason for the small sample size is because adaptation planning is relatively new which leads into the next problem that the findings of this analysis will soon become obsolete.

Chapter 5: Conclusion

The purpose of this research paper was to analyze the discourse of climate adaptation. This purpose was fulfilled through a three part process which included a discussion of environmental discourse in the context of planning; the development of criteria to assess policy; and the application of criteria to a selection of adaptation policies. Dryzek's (2005) four dimensions of discourse (basic entities whose existence is recognized or constructed, assumptions about natural relationships, agents and their motives, and key metaphors and other rhetorical devices) were used to analyze climate change adaptation policy of the HRM and the City of Toronto. Significant findings of the policy analysis are as follows:

- Climate change is assumed to already be happening and requires action.
- Policy enforces a hierarchy in which there are vulnerable "objects" which include the city, citizens, ecosystems that need protection from a "subject" – which has been described as the "City." Though municipalities conduct "community engagement", participation in decision making does not seem to be inclusive; rather the objects in need of protection take on a more passive role in the process.
- Technical experts and government are deemed to have the responsibility to educate the public.
- Metaphors and rhetorical devices suggest urgency, and can be used to reinforce a system of hierarchy that alienates citizens from the process.

Earlier on, I had suggested that the way environmental issues are framed in policy can determine whether they will be supported or not. Therefore, it is important that

planners address the political and social ramifications of discourse within environmental policy. The first issue that needs to be addressed is the elitism masked as science, which is manifested by placing citizens subordinate to decision making. As George Lakoff argues that environmental issues have lost public support over the years because they have been framed in an elitist fashion, the same may ultimately be applied to climate change. Thus, in order to maintain support for climate change adaptation it is important that planners include the public fully in the decision making process.

The second problem with adaptation policy is that planners have negatively framed an environmental issue. More specifically, there are issues associated with the militaristic metaphors of "safety and security" and the catastrophic meaning of the "storm" in regard to climate change. Brendon Larson (2005) in discussing invasive species suggests that such metaphors bring to question the issue of objectivity. Though there is for the most part consensus that climate change is happening, there is still a large amount of uncertainty in regards to impact, and imagery of military and catastrophe in policy may be premature. Such metaphors that invoke fear and militaristic thinking of the natural world should be avoided because they encourage an antagonistic relationship between humans and the natural world and are unsustainable in the long term (Gobster, 2005; Larson, 2005). In order to maintain a sense of legitimacy in the long term, planners should develop an approach that positively and effectively communicates the importance of adaptation.

Primarily, research on the role of planners in climate change adaptation focuses on design and physical planning solutions. Design and physical planning is only one of the approaches through which planners can be involved in climate change adaptation. In

addition to design and physical planning, climate change adaptation planners are responsible for mediating interests of political officials, legal mandates, professional visions, and the request of citizen groups (Forester, 1987). This responsibility presents a unique opportunity for planners to develop a positive and democratic discourse of climate change adaptation.

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