# ON THE IMPLICATIONS OF GOVERNANCE INSTITUTIONS FOR SUSTAINABILITY AND CLIMATE CHANGE ADAPTATION: A STUDY OF WHITEHORSE, YUKON

by

NATHAN NOEL VADEBONCOEUR

B.A. (High Distinction) University of Illinois at Urbana-Champaign, 2006

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**Abstract**

Climate change will pose a challenge to governance structures in areas like the Canadian North (Berkes et al. 2005:225). Climate research has often been divorced from its social context (Cohen et al. 1998:341) and its normative aspects have long been ignored (Swart et al. 2003:S20).

Using the city of Whitehorse, Yukon Territory, as an example, this thesis explores how social context can influence the approaches of governance institutions to environmental policy. This study examines the environmental beliefs of members of the City of Whitehorse and Yukon Territorial Government (YTG) to establish if there are institutional cultural norms promoting a particular environmental orientation among employees. Institutions have been shown to exert pressures on their employees to conform to institutional cultural norms (DiMaggio and Powell, 1983), and there is a broad literature establishing connections between environmental beliefs and values and environmental actions (e.g. Van Liere and Dunlap, 1980; Stern et al. 1995a; Stern et al. 1995b; Stern et al. 2000; Poortinga et al. 2004; Schultz et al. 2005). Thus, institutional environmental belief norms may influence the way City and YTG employees perceive environmental issues and affect the way they plan adaptation strategies.

We found some evidence that social forces within institutions influence environmental beliefs. Beliefs regarding one's confidence in technology to address environmental problems are likely influenced by on-the-job socialization, while other beliefs are not, and may be selected for through selective hiring.

Personal definitions of sustainability were strongly related to institutional affiliation, as were perceptions of a sustainability policy document.

Our results indicate that definitions of sustainability, and to a lesser extent, environmental beliefs, are influenced in part by institutional cultural norms. These norms have the potential to affect policy choices and shape the adaptation strategies of governance institutions.

## Table of contents

## List of Tables

## List of Figures

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## Introduction

The effects of climate change are already pronounced at high latitudes (ACIA, 2005), giving Arctic and Northern governments a strong mandate for adaptation. In the Canadian North there is "a need to develop the capacity to respond and adapt to change, and explore policy directions that can help build resilience" (Berkes et al. 2005:225). Using the city of Whitehorse, located at 60.7°N in Canada's Yukon Territory at the southernmost range of the International Polar Year's definition of arctic, this study will explore how institutional norms in environmental beliefs can affect the way governance institutions approach sustainability and climate change policy.

Climate change will pose a challenge to governance structures in areas experiencing social and environmental transformations, like the Canadian North, especially in the realm of resource management (Berkes et al. 2005:225). Consequently, cities faced with climate threats need to develop strategies to improve their resilience in order to be able to adapt to potential hazards. In this regard, the City of Whitehorse has developed, and is beginning to implement, a sustainability policy named the *Whitehorse Integrated Community Sustainability Plan* (ICSP). Using the ICSP as an example, we will assess how institutionalized norms of environmental beliefs affect policy decisions and the perception of policy by employees of the City of Whitehorse and the Yukon Territorial Government (YTG).

Adaptive capacity is an important component of social resilience, which is the capacity to withstand stress, such as environmental change. Indeed, the two can be seen as loose antonyms (Adger, 2000:348). However, it is important to note that, although they are related, they are not synonymous. Adaptive capacity refers to the *potential* to adapt while resilience refers to the actual responses to stress (Adger, 2001). A city can have the capacity to adapt, but that is not the same as actually adapting to change (Swart et al. 2003:S35). Adaptive capacity is somewhat like holding an unopened umbrella in the rain. Resilience is opening it and placing it above one's head. Actual adaptation (the conversion of adaptive capacity to resilience and the resulting ability to withstand, or adapt, to stress) may require the development of, and, most importantly, the implementation of appropriate policies and practices. Successful application of adaptation policies may require a restructuring of organizational and institutional processes so that they will be able to respond to novel challenges. Although climate change is a physical problem, the restructuring necessary for successful adaptation is a social process. Just as climate change will pose specific physical threats to communities, institutions, through existing norms and beliefs, may pose specific threats to adaptation in the form of barriers to the formation and implementation of policies and the restructuring necessary for their success.

A potential barrier to climate change adaptation in Whitehorse is that it has a small tax base and as such relies heavily on the YTG for funding. This funding, often originating at the Federal level, is vital for the City's sustainability and infrastructure projects. The New Deal for Cities and Communities is a program

where federal Gas Tax revenue is distributed to cities and communities through their provincial or territorial governments (YTG, 2007). In the context of the Yukon, these funds are used for the implementation of ICSPs. All Yukon municipalities are required to complete an ICSP to access funding from Federal Gas Tax revenue through the YTG as part of the New Deal for Cities and Communities (YTG, 2007; Cabott, 2007). An ICSP is a policy document intended for use by municipalities that sets out, "their values and defines environmental, cultural, social, and economic objectives" (YTG, 2007:webpage). The Whitehorse ICSP can be seen as both a sustainability and climate change policy document since it aims to reduce environmental impact while increasing resilience to environmental change. The City defines their mission as follows:

> Whitehorse will be a well-planned self-sustaining community that is a leader in energy conservation and innovation that maintains and conserves wilderness spaces for future generations. Whitehorse will continue to strive for a better quality of life that is reflected in its vibrant economy and social life (Cabott, 2007).

Climate change and sustainability have strong policy relevance (Adger, 2001:922). Indeed, following the release of the Bruntland Commission's report (Bruntland, 1997), diverse levels of government in many countries have adopted sustainability policies, including the organizations within which we are conducting our research (Cabott, 2007:5). In 2007 the City of Whitehorse created a temporary Office of Sustainability Coordinator whose role was to oversee the creation of their ICSP. Climate change in Whitehorse is discussed as a question of 'sustainability' in official documents such as the ICSP and the Official Community Plan (OCP). To date, the ICSP is the policy document that most closely resembles a climate change plan. It is the City's only policy tool to date

aimed at addressing potential challenges associated with changing environmental conditions. Following consultation with staff members and City Council, a draft copy of the ICSP was presented for public comment at a climate change planning 'charette'[1] held in October, 2007. It was proposed as a long-term planning instrument, setting target goals for the years 2015, 2030 and 2050. Following public consolation the plan entered a second stage where it was revised based on public feedback and further input from staff. City Council approved a final version in November, 2008.

The ICSP is a policy requiring collaboration among multi-level governance institutions including both the City and YTG and forms the context in which environmental policy questions are framed by the City of Whitehorse. The Whitehorse ICSP contains a broad outline of wide-ranging self described values and objectives. The ICSP identifies seven core values. However, these are to be understood as seven items Whitehorse residents and the City value, rather than seven core values of the community. These are: (1) sense of community, (2) quality of life, (3) natural beauty and closeness to nature, (4) contributions of the First Nations, (5) leadership, (6) vibrant arts and community, and, (7) local businesses. These are divided into 29 separate goals and a further 100 measures of success (Cabott, 2007:13-15). This initial list of goals formed the basis for selecting projects to receive Gas Tax funding. In the final version of the ICSP, the City decided upon seventeen projects. Fifteen of these, totaling $42,565,000, or (94.1%) of the total ICSP budget of $45,240,000, are for

[1] A charette is a public brainstorming session where participants comment on, and give suggestions to improve, a particular plan.

improvements to physical infrastructure and do not encapsulate all of the seven core values.

Adaptation to climate change is often framed by natural scientists as a geo-biochemical process. For example, Swart et al. (2003:S20) claim it is often viewed as, “a problem related to the long-term disturbance of the global geo-biochemial cycles and the associated effects on global climatic patterns” (Swart et al. 2003:S20). Accepting adaptation as also a significant social process can help increase resilience because the building of, and cooperation among, institutions can help to ameliorate adaptation. For example, Berkes et al. write that,

> The response of the community itself, through its own institutions, is key to effective adaptations to change but support from regional and national level governments is also important in the creation of multi-level governance. (2005:225)

Despite the important role of institutions in climate change adaptation, climate research has often been divorced from its social context (Cohen et al. 1998:341) and its normative aspects have long been ignored (Swart et al. 2003:S20). Indeed, as Cohen et al (1998) point out,

> The vast majority of research funds have been devoted to reducing scientific uncertainties about the physical process, rather than exploring the social context in which they will be understood and experienced (347).

There is a need to explore not only the social context of climate change, but also to explore how well environmental policies (either sustainability or climate change policies) are incorporating the social and biophysical dimensions of the climate

change problem. Throughout the 1980s and 1990s climate change and sustainability have typically been addressed separately (Cohen et al. 1998: 342). However, as is the case for Whitehorse, there are overlapping policy implications for both concepts and it may be useful to examine them together.

Institutions have a strong role to play in climate change adaptation (Berkes et al. 2005:225) because of their potential to respond quickly to environmental changes (Portes, 2006). Understanding the institutional norms that create particular institutional “cultures” is important in understanding the context in which adaptation and environmental policy operate. Institutions can influence the beliefs of their members (DiMaggio and Powell, 1983; Ashworth, 2008). It is therefore helpful to understand the nature of these beliefs because they may either facilitate or inhibit adaptation. A diversity of beliefs can enhance adaptive capacity by providing a diversity of perspectives (Adger, 2003). However, conflict among competing beliefs can reduce adaptive capacity by creating delays (Malalingham and Levitt, 2006). Also, some beliefs, such as those that human technology will always be able to address environmental problems, can be less beneficial to adaptation than others taking, for example, a more diverse approach to addressing environmental changes. The context in which policy decisions are made is an important consideration because particular policies are discussed in the context of other existing policies, institutional arraignments, social norms and cultural values (Stern, 2000; Oreg and Katz-Gerro. 2006). That is, their content, scope, and eventual efficacy will depend on their relationship to other existing policies. For example, employees of a particular organization may be reluctant to

consider a new policy direction because it may run contrary to the accepted institutional position on the subject. Also, a new sustainability policy may have areas of overlap and conflict with an existing policy, creating a situation where only one can be implemented. The local context surrounding these policies (how they were created, where they are in the 'hierarchy' of policies, or how acceptable they are to the general population) is an important concern.

The ability of new environmental policies to deal with novel challenges can be enhanced or constrained by their relationship to other policies and the institutional culture of their parent organization (Swart et al, 2003). For example, policymakers in the Canadian North must be aware of the expectation that many Northern residents have of owning large parcels of land surrounded by greenspace. City planners in Whitehorse discussed how this creates challenges for governments interested in reducing urban footprint by creating infill and urban densification. Elected officials may believe that modifying existing policy to restrict, and increase the density of, residential zoning will upset the electorate. This can create a conflict between the need for more efficient planning and the need for a policy that will allow it to occur. This demonstrates how the beliefs of members of governance institutions can influence policy decisions more than what may be considered best practice. Just as the actions of elected officials can be influenced by what they perceive are the desires of their constituents, the actions of employees within governance institutions can be influenced by institutional norms in beliefs.

There is a wide literature suggesting that institutions help shape the personal beliefs and actions of their members. For example, DiMaggio and Powell (1983:152) suggest that normative pressures exerted on individuals through the processes of professionalization and on-the-job socialization cause them to resemble one another so much so that at the highest levels they become “almost interchangeable.” These normative pressures can influence personal beliefs because, as Stern et al. (1995:1613) point out, peer pressure is important in the formation of attitudes. Institutions also have a strong effect on identity. For example, Santino (1990:328) found that a group of retired porters self-identified as porters and continued to identify themselves as such even after retirement.

The beliefs of individuals working in civic governance institutions that are charged with the responsibility of implementing the ICSP can affect its success as an adaptation plan. This is because values and beliefs can have a causal influence on behaviour, given that a particular set of conditions are met. For example, Stern (2000:412) and his colleagues developed a value-belief-norm theory that “links value theory, norm-activation theory, and the New Environmental Paradigm (NEP) perspective through a causal chain of five variables leading to behaviour.” Institutional norms can potentially influence the actions of their members to conform to an institutionally specific behavioural model. If institutions have different sets of norms, this can potentially create differences in behaviour that could create conflicts in inter-institutional working relationships and reduce adaptive capacity by creating delays in the implementation of projects. In Whitehorse, the City and the YTG must work

together on climate change adaptation policies since YTG must approve ICSP projects for funding. In addition to creating conflicts, some normative beliefs may reduce adaptive capacity by advocating actions that may create vulnerabilities to environmental change, such as an institutional belief norm that technological solutions will always be sufficient to address environmental problems.

Given the importance of beliefs in the development and implementation of adaptation policies this study will examine the environmental beliefs of employees of the City of Whitehorse and the YTG. We will investigate if and where differences in beliefs occur and explore the effect of the institutional "culture" of each governance organization on shaping the beliefs of its members.

In this study we will use the literature on environmental beliefs and institutional analysis as the basis of our assessment of the social dimensions of climate change adaptation in Whitehorse. The environmental beliefs literature has focused on the role of beliefs in influencing environmentally significant behaviour. Research has focused on the social construction of nature through individually held environmental values and beliefs. Researchers have only been able to account for a limited proportion of the variance of environmental beliefs for a few members of a relatively small set of socio-demographic variables: education, political affiliation, acceptance of a 'technological' vs. 'ecological' paradigm, gender, age, nationality, residence, and income. We will control for these variables and expand analysis to include the influence of group membership (in

this case, institutional affiliation) on the social construction of nature and personally held environmental beliefs.

Social processes, such as institutional “cultures,” have received little attention in the study of environmental beliefs. Indeed, institutions are a powerful guiding force in social life but receive very little attention in theories of environmentally significant behaviour. “Workplace culture,” or the normative expectations of the social institutions within employment organizations, exerts strong pressure on employees to conform to accepted modes of behaviour (DiMaggio and Powell, 1983:148). There is evidence that these pressures have a strong effect on organizations and actors, causing individuals to resemble one another in many aspects of their personal and social lives, and organizations to resemble one another in their structure. We will examine whether or not institutional pressures appear to be influencing environmental beliefs among employees of the City of Whitehorse and the YTG.

Governance organizations working in the same region may take different policy directions if they differ in their institutionally held environmental beliefs. This can inhibit adaptation since multi-level governance can help communities cope with a changing environment (Berkes et al. 2005:225). A poor working relationship between elected officials of the City of Whitehorse and YTG can hinder adaptation by providing a barrier to multi-level governance. Institutions are a “central component linking social and ecological resilience” (Adger, 2000:348) and need to be able to work quickly enough to address the challenges presented

by a changing climate. Understanding the beliefs underlying the behaviour of institutional actors can contribute to adaptive capacity by identifying potential future environmental policy directions, reducing conflicts (Malalingham and Levitt, 2007:520), and facilitating multi-level institutional collaboration.

**Organization of Chapters**

The issues presented above concerning the influence of institutions on environmental beliefs and the relationship between these beliefs and actions are examined in the following chapters. *Chapter 1* will provide the theoretical orientation for the thesis. It will discuss previous work on environmental beliefs and their influences on pro-environmental action and review the institutional analysis literature in the context of this study. Although beyond the scope of this study, but relevant for the implementation of potential solutions to the problems of adaptive capacity discussed above, a brief background of the relevant theoretical connections between the institutional analysis, environmental values, and adaptive capacity literature will be provided. This chapter will provide the analytic model linking norms and culture, environmental beliefs, institutional analysis and adaptive capacity. This model is the framework on which this thesis is based.

*Chapter 2* presents the research design and methods used in analysis. It reviews the methods employed in the gathering of background information, the recruitment of participants for both interviews and surveys, and the construction and use of an interview schedule and survey questionnaire. This chapter also

presents a summary of the social characteristics of participants for both YTG the City of Whitehorse.

*Chapter 3* presents and discusses the results of our quantitative analysis of the institutional influence on the environmental beliefs of our participants. The differences between and within each group are described both overall and in a number of sub-categories. We then discuss the implications of these findings.

*Chapter 4* presents and discusses the results of our qualitative inquiry into the way our participants conceptualize sustainability as a concept, and perceive the Whitehorse ICSP. We relate our findings from the previous Chapter on the institutional influence on environmental beliefs to our qualitative data and discuss the effect of institutional cultural norms on perceptions of sustainability and environmental policy.

*Chapter 5* summarizes our results and discusses their implications for the City of Whitehorse. It then provides concluding remarks on this study's findings regarding institutional perceptions of the sustainability concept.

# Chapter 1: Literature Review

## 1.1 Introduction

This chapter provides the theoretical orientation that underlies our subsequent analysis. Previous work on environmental beliefs and their influences on pro-environmental action are presented first, followed by a review of the institutional analysis literature in the context of this study. The institutional analysis review provides an operational definition of institutions and focuses on how institutional forces pressure actors to conform to an expected model of behaviour. A brief background of the relevant theoretical connections between the institutional analysis, environmental values, and adaptive capacity literature follows. This chapter concludes by introducing the analytic model linking norms and culture, environmental beliefs, institutional analysis and adaptive capacity that will be elaborated in the methods section.

This study intends to contribute to the literature on environmental beliefs and their influence on pro-environmental behaviour by expanding the research focus from a predominantly individual level to include the influence of group membership on personally held beliefs. We will explore the role institutions play in influencing beliefs and actions by examining environmental beliefs, definitions of sustainability, and environmental policy by comparing employees of the City of Whitehorse and the Yukon Territorial Government (YTG). We will also compare novice employees and experienced veterans within those organizations. We aim to identify issues that may potentially facilitate or impede climate change adaptation in Whitehorse.

### 1.2 Environmental Beliefs and Pro-Environmental Actions

Research into the causes of environmentally significant behaviour has focused on the social construction of nature through individually held environmental values and beliefs. Authors have offered explanations for the relationship between environmental beliefs and actions using various models including Norm Activation Theory (Stern, 2000; Schultz et al. 2005), Value-Belief-Norm Theory (Stern, 2000) and the Theory of Planned Behavior (Kaiser, 2005). To date, the influence of group membership in guiding environmental orientations remains largely unexplained. Researchers have focused primarily on the impact of various demographic and social factors that account for a limited proportion of the variance in environmental beliefs. Such factors include: education, political affiliation, acceptance of a 'technological' vs. 'ecological' paradigm, gender, ethnicity, age, nationality, residence, and income. The influence of attitudinal variables such as values and beliefs about environmental concern (Van Liere and Dunlap, 1980; Stern et al. 1995a; Stern et al. 1995b; Stern et al. 2000; Poortinga et al. 2004), and the effect of value orientation (e.g. altruistic, egoistic, biospheric (Schultz et al. 2005:459)) on environmental behaviour (Stern et al. 1995a; Stern et al. 1995b; Poortinga et al. 2004; Schultz et al. 2005) have also been explored.

Early research in the social bases of environmental concern was met with little success (Van Liere and Dunlap, 1980:193) as findings were typically weak and studies were often contradictory. In the late 1970's Van Liere and Dunlap proposed that environmental attitudes were changing from an environmentally

detrimental anthropocentric paradigm to a new pro-ecological paradigm they termed the New Environmental (now 'Ecological') Paradigm (NEP) (Van Liere and Dunlap, 1980). It was hypothesized that this new paradigm could explain the increase in pro-environmental attitude observed during the latter half of the twentieth century (Van Liere and Dunlap, 1980). Throughout the 1980s some research supported the notion that society was developing a more pro-environmental orientation. For example, Arcury and Christianson found a small increase in environmentalist worldview in a five-year study in Kentucky. This increase, they claimed, was "consistent with most studies on environmental attitude conducted in the 1980s" (1990:402). However, an extensive literature review at the end of the decade found "no evidence in nearly two decades of a broadening of the social bases of such concern" (Jones and Dunlap, 1992:44). It is important to note that the pro-environmental attitudes that appeared in the 1960 did not decline throughout this time amongst the urban, well-educated population,

> Whatever led younger, urban, well-educated, politically liberal, and Democratic adults employed outside of primary industries to be somewhat more concerned about environmental protection than their counterparts two decades ago seems to have persisted through the 1980s. (Jones and Dunlap, 1992:44)

Although findings suggest that the social basis of environmental concern has remained stable it is important to point out that in this case "we are speaking about attitudinal concern for environmental quality" and "not actual behaviour nor activism on behalf of environmental protection" (Jones and Dunlap, 1992:44). Indeed, many authors "have agreed that a new kind of social paradigm is presently superseding the established technologically oriented paradigm in

contemporary societies" (Olsen et al. 1992:74). The literature does not contain data on the social basis of environmental concern prior to the beginning of the environmental movement and comparisons cannot be made to empirically verify the claim that more people are adopting pro-environmental beliefs and values than before.

Nonetheless there is agreement that environmental concerns are gaining prominence (Olsen et al. 1992:74), as more people are engaging in pro-environmental actions. The Montreal Process, Rio Earth Summit, Kyoto Protocol, and the prominence of environmental issues in contemporary political discourse also suggest that there is more pro-environmental support than fifty years ago. If the base of environmental support is not broadening, it is possible that the recent increase in pro-environmentalism is a result of increased numbers of those with pro-environmental orientations taking action. This may be motivated by an increased perception of environmental threat due to more frequent threat messages in the media and public life.

Several authors have explored the notion of an increased threat motivating those with pro-environmental beliefs to take action (e.g. Stern et al. 1995a; Stern, 2000; Schultz et al., 2005; Poortinga et al., 2006). For example, Stern argues for a Value-Belief-Norm theory where, "the consequences that matter in activating personal norms are adverse consequences to whatever the individual values" (2000:413). Schultz et al. claim that, "there is an increasing awareness that the natural environment is being harmed by human actions" and goes on to state that

"polling data suggest environmental problems are among the most important social problems of the day" (2005:457). As more people perceive potential climate change impacts as threats, those with pro-environmental beliefs may be more likely to take pro-environmental action. This is especially true when individuals perceive that the pro-environmental actions they take can make a difference and reduce the perceived threat (Stern, 2000:412).

Because of the need to increase pro-environmental actions among the general public and governance institutions, research into environmental beliefs remains very important. The NEP scale has been found to be a valid and reliable measure of environmental orientation (Dunlap et al. 2000:427-428) and is generally accepted as such (Arcury and Christianson, 1990; Stern et al. 1995b; Dunlap et al. 2000; Stern, 2000). A high NEP score "should lead to pro-environmental beliefs and attitudes on a wide range of issues" (Dunlap et al. 2000:428). Indeed, the majority of respondent's NEP scores on Olsen et al.'s (1992) NEP survey in Washington State would suggest that they hold pro-environmental orientations, something that has been found in the West and internationally. For example, Schultz et al. (2005) found the frequency of those with pro-environmental values to be consistent among a pool of respondents from Brazil, the Czech Republic, Germany, India, New Zealand and Russia. Given the increase in pro-environmental action, determining the environmental orientation of individuals can provide the basis for a study of their motivations to take such actions. In the context of our study, the institutional environmental beliefs and values held by employees of Whitehorse and YTG can provide a

starting point for an analysis of the potential for those working in each organization to support efforts to embark on a new environmental policy direction, such as sustainability or climate change adaptation.

While early research in environmental beliefs in the 1970s and 1980s was aimed at exploring the number of individuals with pro-environmental orientation, research throughout the 1990s and early 2000s focused on addressing the motivations of those with pro-environmental orientations to practice pro-environmental behaviours (e.g. Stern, 2000; Poortinga et al. 2004; Schultz et al. 2005). Theories such as Norm Activation and Value-Belief-Norm theory postulate that environmentally significant behaviours are activated by the perception of threat to a valued object, in this case, the environment, or, human health (Stern 2000:412; Schultz et al. 2005:471). There is “cross-cultural evidence for the link between values, environmental attitudes, and environmental behaviors” (Schultz et al. 2005:473). For example, a model linking environmental concern with perceived threat and pro-environmental behavior presented a good fit across a sample of 27 countries “validating a comprehensive model of pro-environmental behavior” (Oreg and Katz-Gerro, 2006:476).

The past 40 years have seen a surge in pro-environmental behaviour yet human-caused environmental degradation has been a problem for thousands of years. For example, excessive cultivation stressed the land near the Roman city of Leptis Magna, once one of the most productive areas of Roman Empire, laying the foundation for its eventual desertification after the fall of Rome and

occupation of North Africa by the Berbers and their large flocks of heavily grazing animals (Ponting, 1993:77). Although such major anthropogenic environmental changes have been visible for centuries, large-scale environmental concern is a relatively recent phenomenon. It is possible that historical questions regarding limits to growth were not relevant given low human populations and a large "wilderness" into which they could expand. Today, visible limits to growth have fostered public discourse regarding the possibility of acute threats to our way of life and valued natural areas. Issues such as climate change and a large human population now challenge contemporary society to consider questions such as limits to growth.

Despite visible environmental degradation and the articulation of an environmental ethic in the early part of the nineteenth century by transcendentalists like Ralph Waldo Emerson and Henry David Thoreau, large-scale public expression of environmental concern was not seen until John Muir and the Sierra Club lobbied for the protection of the Hetch Hetchy valley in 1901. Hetch Hetchy is a unique example because Muir was able to frame the proposed flooding of the valley as both a threat to the newly established national park system and to nature itself. Potentially more significant was Muir's ability to frame nature as beautiful and vulnerable, pitted against the destructive power of human machines. Hetch Hetchy is one of the earliest examples of a shift in the social construction of the environment, framing nature as vulnerable rather than dangerous, a theme that was also occurring in Canada and would come to represent a marked shift in twentieth century Canadian literature (Atwood, 1972).

Determining whether or not climate change is perceived as a threat is an important consideration since recognizing limits to growth or viewing nature as vulnerable are not enough on their own to create concern. Indeed, environmental degradation itself is not a predictor of environmental concern. As John Hannigan describes, “Public concern is not automatic even when things are bad” and that,

> Environmental concern is not constant but rather fluctuates over time, rising and falling in prominence. Furthermore, environmental problems do not materialize by themselves, rather, they must be ‘constructed’ by individuals or organizations who define pollution or some other objective condition as worrisome and seek to do something about it (Hannigan, 1995:2).

Stern (2000:412) and Schultz et al. (2005:472) have argued that environmentally significant behaviours are activated by the perception of threat to a valued object, in this case, the environment itself. This builds on Hannigan’s assertion that bad conditions alone aren’t a cause for concern, these conditions must also be perceived as a threat. Climate change is widely recognized as something that will pose challenges to human society, especially those living at high latitudes (ACIA, 2005). The prevalence of negative images such as wildfires and floods associated with climate change could certainly suggest that conditions are “bad.” However, those living in areas likely to be directly affected by climate change such as Whitehorse, will not necessarily take action to mitigate or adapt to the threat simply because things are projected to “get worse.” Motivating people to take pro-environmental action, and possibly to also take actions to increase adaptive capacity, could possibly require the negative consequences of climate change to be framed as a specific and feasible threat.

The modern environmental movement gained prominence shortly after Rachael Carson published Silent Spring (1992), showing the harmful effects of the pesticide DDT on both animals and humans, triggering widespread public outrage and an eventual ban on DDT. Like Hetch Hetchey, Silent Spring is a unique example because it not only galvanized public opinion regarding the use of chemicals such as DDT, but presented one of the first major public challenges to the technocratic paradigm that human ingenuity is not only necessary, but benevolent. Although environmental pollutants had been recognized for some time prior to *Silent Spring*, Carson's book extended the perception of environmental pollution as not only an environmental hazard, but also a danger to human health. That this point catalyzed public outrage provides further support for the notions of Stern (2000:412) and Schultz (2005:472) that environmentally significant behaviours are activated by a threat to a valued object, and that of Hannigan that environmental problems are socially constructed (Hannigan, 1995:2), reinforcing the importance of context in pro-environmental action. In Whitehorse, it is important to understand the context in which environmental decisions are made.

Given the importance of context it is important to note that there are many differences between Canada and the United States regarding the level of support for environmentalism. As such, our findings may differ from findings in the predominantly American literature on certain points. For example, the literature has demonstrated that urbanites are more likely to be concerned for the

environment than their rural counterparts (Jones and Dunlap, 1992:38). This may be due to an increased likelihood among urbanites to frame nature in the context of a dense, expanding human population where limits to growth must be considered in order to protect a vulnerable nature. Rural residents on the other hand, who are more exposed to more "nature" on a daily basis, may not frame environmental problems in the same way.

Whitehorse is a small urban center, yet is often described as a "wilderness" city. The level of environmental concern in Whitehorse can affect its potential to adapt to climate change. If residents follow the urban tendency to be concerned for the environment this may lead to an increased propensity for pro-environmental action. However, if they follow the rural trend where residents are less concerned, they may be less likely to take action to address adaptation issues. It is important to determine the level of environmental concern and the perception of climate change as a threat in Whitehorse because of its potential to predict the likelihood of pro-environmental action. Many Canadians view "wilderness" as a part of their national identity while this is often not the case in the United States. Given the volume of the Canadian "wilderness" it is possible that the rural/urban distinction found in studies of Americans will not hold for Canadian subjects, especially since Whitehorse is an urban center that self-identifies with "wilderness."

The explanations offered for the relationship between environmental beliefs and actions using various models including Norm Activation theory (Stern, 2000;

Schultz et al. 2005), Value-Belief-Norm theory (Stern, 2000) and the theory of Planned Behavior (Kaiser, 2005) have focused largely on the individual. To date, the influence of group membership in guiding environmental orientations remains largely unexplained. In the 1990s the need to explore the influence of social context was highlighted by Stern et al. who wrote, “We emphasize that individuals are embedded in a social structure that has substantial influence on all psychological variables,” and that “It [social structure] also provides opportunities and constraints that shape behavior and the perceived response to behavior” (1995:726). Stern et al. (1995) set out to measure the influence of an individual’s position in the social structure on their environmental beliefs and values. However, they maintained the trend of measuring individual-level characteristics (Oreg and Katz-Gerro, 2006:465). Recently, Oreg and Katz-Gerro have argued that “the context in which individuals behave should be conceptualized at a level higher than the individual” (2006:466). Oreg and Katz-Gerro expanded on the notion of position within the social structure discussed by Stern et al. (1995) suggesting that “the culture within which individuals behave constitutes a meaningful context for the creation of the attitudes and beliefs that ultimately guide behavior” (2006:466).

Oreg and Katz-Gerro (2006) examined the cultural influences on beliefs using an international sample of participants, however, cultural differences exist intra-nationally as well. There is widespread support for the notion that culture has influence on beliefs. For example, being a member of a definable social category, such as belonging to a particular “ethnicity”, has been shown to correlate with

personally held values and perceptions of risk (Gaines et al., 1997:1472; Satterfield, Mertz, and Slovic, 2004:118-119). Being a member of a distinct group contributes to group identity because members of such categories often share similar social experiences (Satterfield, Mertz, and Slovic, 2004:120-121). In the environmental beliefs literature, the socio-demographic categories that have been able to account for the most variance in environmental beliefs and actions focus, albeit indirectly, on shared experiences of social life and group identity. These differences in beliefs need not be restricted to non-voluntarily group membership (such as ethnicity or nationality) but can include more optional memberships as well. For example, political affiliations, especially in the United States where most studies have taken place, have been shown in several studies to correlate significantly with environmental beliefs (Van Liere and Dunlap, 1980:191; Olsen et al., 1992:51, Jones and Dunlap, 1992:40), possibly because members of political groups share certain beliefs an values.

Values and beliefs have a strong role to play in the study of institutions. As Davenport and Prusak (1998:12) point out:

> Organizations are, after all, made up of people whose values and beliefs inescapably influence their thoughts and actions. The organizations themselves have histories, derived from people's actions and words, that also express corporate values and beliefs.

Given the role of values and beliefs in the study of institutions it is useful to provide a brief discussion of each. A belief can be thought of as the mental state of holding a proposition to be true. One can come to the conclusion that a particular proposition is true or false by actively thinking about it and using logical arguments. However, propositions can also be either accepted or rejected

without much thought if they fit into an associated network of mental schemas for which that individual has already established beliefs.

Beliefs are strongly influenced by values. Individual values often stem from an ideology (or ethical/moral code), are hierarchically arranged, and have been defined as “a broad tendency to prefer certain states of affairs over others” (Hofstede, 1984:18). Values are programmed early in life, are often non-rational, and yet “determine our subjective definition of rationality” (Hofstede, 1984:18). Most differences in values are argued to result from early-years socialization and to remain stable throughout life, while beliefs are thought to form from values but be more malleable and open to influence from personal experiences in adulthood (Stern et al. 1995:726-727). For this reason the focus of our research will be on environmental beliefs, as opposed to values.

Past research has focused primarily on random samples of regional populations, typically representing diverse groups of individuals (e.g. Arcury and Christanson, 1990; Jones and Dunlap, 1992; Poortinga et al. 2004; Schultz et al. 2005). These diverse samples are intended to be representative of the general population and as such do not enable one to investigate the effect of membership in a particular social group on environmental beliefs and actions. Given the influence of context on beliefs, investigating the influence of group membership on environmental beliefs is important.

While we accept that, “cultural dimensions represent the common and shared ideals of individuals within a given society,” we disagree with the statement that, “Differences in cultural dimensions can therefore be observed only between societies rather than between individuals” (Oreg and Katz-Gerro, 2006:466). While there certainly may a multitude of differences between societies, cultural differences within societies, such as the example of “ethnicity” provided above, do exist and clearly play a role in attitude formation. One such intra-national cultural dimension that has received very little attention in theories of environmentally significant behaviour, is the role of institutions.

Given the ambiguity between institutions and organizations it is useful to provide an operational definition of each before proceeding with an explanation of how institutions influence environmental beliefs and actions. Institutions provide the lubrication necessary to keep the machinery of society moving smoothly. While there has been disagreement on their exact definition, it is acceptable to think of them as the rules governing social behaviour in a particular context (Ostrom, 1986). Given the emphasis on rules, one proposed definition is, “durable systems of established and embedded social rules and conventions that structure social interactions” (Hodgson, 2003:163). In our study the term “institution” is used to refer to an entity, either formal or informal, that creates social roles based on a set of behavioural rules encapsulating values, norms and worldviews held by individuals and organizations (Fiori, 2002; O’Riordan and Jordan, 1998). To summarize, institutions, in this context, refer to the “culture” that guides behaviour within organizations.

Organizations, in this case, are defined as the context in which institutions operate. They are social entities that exist “on paper” and are easily definable, such as a corporation. To summarize the distinction, ‘company x’ is an organization and the norms, values, and expectations that inform and constrain the behaviour of employees of ‘company x’ can be considered as its institutional framework or culture.

### 1.3 Institutional Analysis and Institutions

Institutions are a powerful guiding force in social life but receive very little attention in theories of environmentally significant behaviour. This is despite the fact that “workplace culture,” or the normative expectations of social institutions within employment organizations, exerts strong pressure on employees to conform to accepted modes of behaviour (DiMaggio and Powell, 1983:148). There is evidence that these pressures have a strong effect on organizations and humans, causing individuals to resemble one another in many aspects of their personal and social lives, and organizations to resemble one another in their bureaucratic structure. These normative pressures, termed “isomorphic pressures,” have created a “startling homogeneity or organizational forms and practices” (DiMaggio and Powell, 1983:148) within organizations operating within the same field. These pressures are also reflected at the personal level. For example, individuals at the top of many organizations are “virtually indistinguishable” from those in similar positions in other organizations (DiMaggio and Powell, 1983:153). Individuals occupying other ranks throughout the

institutional strata also conform to “common expectations about their personal behavior, appropriate style of dress, organizational vocabularies, and standard methods of speaking, dressing, joking, or addressing others” (DiMaggio and Powell, 1983:153).

The institutions of the City of Whitehorse and the YTG likely influence the beliefs of their employees in this way. If each institution promotes a common set of environmental beliefs to their staff this may facilitate climate change adaptation by increasing the likelihood that they will be able to reach compromises in negotiations. On the other hand, if each institution promotes different beliefs climate change adaptation may be inhibited since these differences may lead to disagreements in collaborative projects. For example, Malalingham and Levitt (2007:520) describe an example of how differences between the aesthetic views of German and American construction companies led to delays in a major construction project.

Institutions have a degree of permanence and are relatively stable over time (O’Riordan and Jordan, 1998:82; Hodgson, 2003). The specific details governing them are not rigid but rather exhibit a degree of plasticity as institutions become “a reflection of the evolving mental models” (Fiori, 2002 p.1035) of a society whose values, norms, and worldviews are constantly in flux (March and Olsen, 2005; Pelling and High, 2005; Portes, 2006; Swart et al. 2003).

Institutions give meaning to behaviour by providing the context of a behaviour-guiding structure. Their significance remains relatively constant regardless of the actor(s) occupying the role(s). Individuals interact with myriad institutions on a daily basis, themselves acting as agents occupying numerous roles. The use of well-known mental schemas (Kaplan, 1966) associated with a particular institution allows two complete strangers to interact in a structured way where each knows how to act and what to expect in response (Scott, 1995). For example, one can enter any branch of a bank with which they have an account and complete a transaction by following the institutionally provided script for a client-teller interaction. This behavioural constraint facilitates action by permitting the actors to interact, not as individuals, but rather as occupants of known institutional (social) roles (Hotimsky et al., 1996; Jepperson, 1991). For example, Hotimsky et al. argue that "institutions structure interactions by either affecting the range of available alternatives or by providing information and enforcement processes that reduce uncertainty about the corresponding behaviour of others" (2006:41). Indeed, institutions "define roles and provide a social context for action" (O'Riordan and Jordan, 1999:82). This context helps to,

> Reduce uncertainty in human interactions and help solve the problem of coordination, especially in modern economies where specialization and the division of labor give rise to the need for sustaining complex exchanges over time and across space. (Nee and Ingram, 1998:21)

Enhancing coordination is an important consideration when adapting to a fast-moving threat like environmental change, since institutions must be able to adapt quickly to be effective (Portes, 2006). Indeed, the degree of responsiveness to change is an indicator of vulnerability (Kelly and Adger, 1999), and faster moving

institutions are more likely to be able to adapt to change that slower moving ones.

Institutions can accomplish more than individuals acting in the absence of a behaviour-guiding structure. It is through the roles they support that institutions become, “the multitude of means for holding society together, for giving it a sense of purpose, and for enabling it to adapt” (O’Riordan and Jordan, 1998). Institutions can also inhibit actions such as adaptations to environmental change by constraining the choices available to actors and molding their preferences, creating path-dependency. It is “easier for political actors to work with the grain of institutions than against it” (O’Riordan and Jordan, 1998:83) because institutions place pressure on actors to conform to a set of normative and official rules.

Understanding the institutional culture of both the City of Whitehorse and the YTG can allow, continuing the analogy from O’Riordan and Jordan (1998), the direction of the “grain” of each institution to be identified. It is likely that this grain does not flow uniformly toward sustainability. If this is the case adaptation supporting and inhibiting grains can be identified and communicated to each organization.

Institutional pressures to conform to a set of institutional rules can be a very pervasive force. Conformity to institutional norms has been described as the "agentic shift" (Blass, 1999) and takes place in individuals when they are occupying an institutional role within an organization (Card, 2005). The “shift”

that occurs is a change from one's role in non-work life (such as spouse, child, parent, neighbour etc.) to that of an employee (agent) of a particular organization. Social agents often define themselves not only as part of an organization, but with identities associated with different roles within the organization (March and Olsen, 2005:10). By defining themselves in terms of those identities, individuals "act to fulfill them rather than rather than by calculating expected consequences" (March and Olsen, 2005:10) because there is an erosion of personal agency while occupying institutional roles (Card, 2005).

The agentic shift is relevant to climate change policy because, when faced with uncertainties such as the uncertainties of potential climate impacts, actors will often conform to the institutionally appropriate mode of behaviour and avoid contradicting accepted values (DiMaggio and Powell, 1989; Hotimsky et al., 2006; Pelling and High, 2005:8). For this reason, reluctance to contradict accepted values may be particularly cumbersome for climate change policy because the institutionally appropriate "business as usual" approach may fail to address potential climate impacts. The generation of effective solutions to novel problems, such as those presented by climate change, will likely require changing the way impacts both on the environment, and on infrastructure as a result of the environment, are considered in planning. For example, if an institution's culture supports policies that either degrade the environment or fail to take potential climate impacts into account, agents acting within that institution may, as a result of the agentic shift, continue with unfortunate practices because they do not want to challenge accepted values. In this situation the erosion of

personal agency due to the agentic shift eliminates potential cognitive dissonance through the justification that actors are “just doing their job” and are not personally responsible for their behaviours. In this case even actors with pro-environmental values and/or beliefs who would like to change the “business-as-usual” approaches to ones that are more sustainable may be prevented from doing so due to normative behavioural rules. It is important to note that institutions are not the cause of this behaviour but rather one of many contributing factors (Haslam and Reicher 2007; Kelman and Hamilton, 1989; Staub, 1989; Valentino et al., 2004; Waller, 2002) and actions taken as an “agent” within an organization must be analyzed in context.

Actors are more driven by “concerns for doing what is institutionally acceptable and culturally appropriate than by some kind of cost-benefit analysis” (Hotimsky et al. 2006:41). Actors conform to institutionally specified behaviours because they provide legitimacy (Mahalingham and Levitt, 2007) and avoid challenging accepted values (Pelling and High, 2005:8). This occurs when actors wish to avoid confrontations that may expose themselves to negative responses in the future, avoid ideas that may evoke negative feelings, and/or expose others to blame, and to maintain control of a situation by avoiding public questioning of a privately held view so that it cannot be refuted (Argyris and Schon, 1996). These types of constraints can create action paradoxes. For example, actor A will refrain from saying something that could upset actor B. Actor B may detect that actor A is withholding something, but not discuss it because they know that actor A is withholding a view because it may create conflict. As such there are,

> Two individuals acting in ways that are undiscussable, and their undiscussability is undiscussable. All these consequences not only maintain the original action paradox, but they make it unlikely the paradox will ever be discussed (Argyris, 1999:93).

Paradoxes such as the one mentioned above have been termed “organizational defensive routines” that are taught through socialization and maintained by the culture of the organization (Argyis, 1999:93). When faced with decisions regarding the uncertainties associated with climate change impacts, agents will likely follow the institutionally acceptable mode of behaviour. If institutional norms regarding environmental beliefs exist, actors may potentially engage in action paradoxes, reducing the likelihood of discussion of novel adaptation measures that may go against the grain of the institution.

A phenomenon similar to pluralistic ignorance provides another example of how an actor within an organization may be unwilling to come forward with a new idea that may be potentially useful for adaptation. Pluralistic ignorance is where, “virtually every member of a group or society privately rejects a belief, opinion, or practice, yet believes that virtually every other member privately accepts it” (Prentice and Miller, 1996, p. 161). If an organization has an official position on a topic (for example, a particular definition of sustainability), it is unlikely to be challenged by its members out of a desire to avoid conflict (Argyris and Schon, 1996). When this happens change may not occur even if there is a group of actors with views contrary to the accepted norms. In short, institutional cultures contrary to what is necessary for adaptation (for example, a sustainability project that falls outside what is traditionally acceptable) may provide a barrier. In the

context of Whitehorse, one such barrier may arise if the governance institutions have developed a culture of working in 'silos' where intra- and inter-organizational/departmental collaboration is uncommon. Collaboration is crucial for adaptive capacity since a diversity of perspectives and institutional forms enhances resilience (Adger, 2001; Berkes et al. 2005) and cross-institutional collaboration is crucial for adaptation (Adger, 2003).

These types of behavioural constraints are an important consideration for adaptive capacity because cross-institutional collaboration is crucial for adaptation (Adger, 2003:388; Berkes et al. 2005:240-244). If there are different sets of values and beliefs constraining the behaviours of members of organizations that must work together on climate change policy, responsiveness can be slowed, thereby increasing vulnerability.

Examining institutional trends in behaviour is important because the institution one interacts with at work can influence their beliefs. Employment identity constitutes a strong component one's of place within the social structure, or role. Indeed, as Portes points out, "it is as role occupants that individuals enter into the social world and are subject to the constraints and incentives of norms" (2006:238). Occupation is a strong component of identity and provides people, at least while at work, with a clear role and an accompanying set of norms to negotiate. This role influences their position within society and, in turn, their beliefs (Oreg and Katz-Gerro, 2006:465). For example, in a study of construction workers, flight attendants, and porters, Santino relates:

> What I found among porters was a very strong sense of personal identity derived from their occupation. After years of retirement all the men I spoke to still see themselves first as Pullman porters, continue to socialize with other porters, and willingly discuss the paradoxes of the job (1990:328).

Part of the reason the men Santino interviewed have such a strong sense of identity from their work can possibly be explained the effect of their socialization into a particular social group. For example, Santino also describes how pranking of novice construction workers and flight attendants is often seen as, "occupational rites of passage that not only identify a new worker that is ignorant of the ways of the group, but also help to affect transition into the group" (1990:321). Pranking can be understood as a form of, "pervasive on on-the-job socialization" to which new employees are often subjected (DiMaggio and Powell, 1983:153). On the job socialization need not include pranking, but rather any activity that helps teach a newcomer behavioural norms. Thus, it is likely that the longer employees of the City of Whitehorse and the YTG spend at their jobs, the more they will be subjected to workplace socialization as they become indoctrinated into their new roles. Workplace socialization does not only teach the norms governing behaviour within a new organization but also influences attitudes. As Stern et al. (1995:1613) point out, "Social processes such as peer pressure and indoctrination are clearly important in forming attitudes." Socialization in the workplace, "acts as an isomorphic force," that "could reinforce, not erode, differences among organizations" (DiMaggio and Powell, 1983:153). If the City of Whitehorse and YTG have different sets of environmental beliefs these beliefs can be transmitted to, and internalized by,

their employees through on the job socialization. This can potentially result in inter-institutional differences in environmental beliefs.

Institutions have been mentioned as a potential causal influence on environmental behaviour and action (Dietz et al. 1989). However, their influence is generally not directly investigated in the literature. Research on the social-demographic influences on environmental beliefs and behaviour supports the role of institutions in the formation of beliefs and their resulting actions. For example, institutions attract candidates with similar backgrounds due to the isomorphic pressures of professionalization and further shape attitudes of actors once hired (DiMaggio and Powell, 1983; March and Olsen, 2005; Ashworth, 2009). Education, an aspect of professionalization, has been found to be one of the best predictors of environmental behaviour (Jones and Dunlap, 1992; Olofsson and Ohman, 2006). Professionals within a particular field have attitudes distinct from those of the general population (e.g. regarding perceived risks presented by environmental (Dietz et al. 1989), health (Poltorak et al. 2005), and chemical (Slovic et al. 1995), hazards or conflicts).

A social actor within the workforce occupies two occupational categories and both influence their beliefs and behaviours. Individuals are both members of the organization that employs them, and professionals within a field. While the process of professionalization does cause individuals to become somewhat similar (DiMaggio and Powell, 1983:152), these effects are not as strong as the pressures to conform encountered within one's workplace. For example, a study

conducted by Dietz, Stern, and Rycroft (1989) found that environmental policy professionals, “hold definitions of conflict consistent with the values and interests of the organizations for which they work and the professions of which they are members,” and that, “The effects of professional identity are weaker than those of institutional affiliation” (47, 61). This is relevant to our study because, although it is expected that the professionals we interview will share some similarities regardless of whether they work for the City or YTG as a result of their professionalization in common fields (e.g. each institution employs engineers and planners who were each subject to professionalization within the same field), there is the potential for strong differences as a result of their employment within different institutions. A study by Dietz, Stern, and Rycroft (1989:61) found that institutional forces operating within employment organizations are a greater influence on the beliefs of their employees than professional affiliation. This supports the argument that members of organizations within a particular field, although sharing beliefs to a degree, can differ. We will explore the degree to which socialization into a particular institution affects these potential differences.

### 1.4 Beliefs, Institutions, and Climate Change Adaptation

Climate change and sustainability have strong policy relevance and there is a need to give more attention to climate change adaptation (Adger, 2001:922), especially in the North where mitigation will have little effect due to the small population and their relatively low overall emmisions. Following the release of the Bruntland Commission’s report (Bruntland, 1997) diverse levels of government in

many countries have adopted sustainability policies, including the organizations within which we are conducting our research (Cabott, 2007:5).

Assuming beliefs underscore actions, and that institutions can influence these beliefs, understanding environmental beliefs in governance institutions can potentially help predict what type of action a governance institution will take on environmental policy decisions. Governance organizations working in the same region may take different policy directions if they differ in their institutionally held environmental beliefs. This can potentially create conflict. The City of Whitehorse and the YTG work together in a range of fora and institutional differences in environmental beliefs may occur. This could inhibit adaptation since multi-level governance can help communities cope with a changing environment (Berkes et al. 2005:225). Institutions are a, “central component linking social and ecological resilience” (Adger, 2000:348). Understanding the norms underlying the behaviour of members of institutions that often collaborate can help address conflicts (Malalingham and Levitt, 2007:520), and facilitate multi-level institutional collaboration, enhancing adaptive capacity. It is important to note that adaptive capacity can be reduced even in cases when institutional beliefs are aligned. For example, institutions sharing similar beliefs such as the belief that climate change is not a threat can reduce adaptive capacity be failing to consider potential future environmental changes.

It is important to identify the root of norms that can potentially impede the implementation of adaptation-friendly policies (Swart et al. 2003). Institutional

diversity may increase resilience by increasing the potential for collective action (Adger, 2001; Berkes et al. 2005) since the adaptive capacity of societies is "bound up in their ability to act collectively" (Adger, 2003:388). However, inter-institutional disagreements can decrease the likelihood that collaboration will be effective (Swart et al. 2003; Mahalingham and Levitt, 2007).

Policy has a strong role to play in adaptation to environmental threats at multiple scales. For example, legal systems can pressure organizations to conform to particular organizational controls (DiMaggio and Powell, 1983:150), and treaties can divide responsibilities among institutions and organizations (Adger, 2001:923-924). Governance institutions must be able react appropriately to climate change impacts because the capacity of social groups to adapt depends on the quality of the "formal institutions under which they reside" (Adger, 2003:393). Governments can indirectly influence adaptive capacity through their own initiatives and through their effect on adaptation-enhancing institutions through change brought on by regulatory structures (DiMaggio and Powell, 1983:150)

Culture models are an integral part of institutional change, including change that enhances adaptive capacity (Portes, 2006:237-240; Adger, 2003:400: Schluter, 2007:1091). Research by Adger (2003) supports the argument of Stern (2000) and others that norm activation is an important part of pro-environmental, and in this case adaptive, behaviours. For example, Adger writes that,

> When actors perceive adaptation to and the risk of climate change as being within their powers to alter, they will be more likely to make the connection to the causes of climate change, thereby enhancing their mitigative, as well as adaptive, capacity (2003:401).

The culture of institutions is relevant to research involving the social dimensions of climate change. This is because institutions have the potential to contribute to our understanding of these social factors influencing adaptation to environmental change. For example, Hotimsky et al. write that,

> Given the relative potential of institutional theories to increase our comprehension over the various dimensions of human–environmental interactions, it has become increasingly important to attempt to consolidate different interpretations of what institutions are, and how they influence social and environmental outcomes. (2006:41)

Social research into institutional responses to climate change could benefit society by encouraging institutions to take proactive policy directions and increasing the likelihood that these policies are enacted. Strong institutions can also promote adaptation in the general public, further enhancing adaptation. For example, Adger has found that,

> Legitimate and proactive institutions promote the sustainable management of resources, which in effect, maintains the resilience of the social-ecological systems on which the population of Tobago depends and ultimately enhances adaptive capacity (Adger, 2003:398).

Adaptation to climate change in Whitehorse can likely be facilitated or impeded by institutional cultural norms. The ability of the City and YTG to collaborate is also an important consideration. Institutionally held beliefs regarding the environment can influence the success of efforts to enhance the resilience of the

“social-ecological systems” described by Adger. The following chapters describe the methods used in data collection, results of analysis, and discuss their relevance to increasing the adaptive capacity of Whitehorse.

## Chapter 2: The Research Process

### 2.1 Introduction

This chapter deals with the methodological components of the survey and interview design used to collect data for this study. It discusses the present study in the context of the greater Community Adaptation and Vulnerability in Arctic Regions (CAVIAR) study of which it is a part, and in the context of the broader research literature. It presents the indicators of environmental beliefs used as the dependent variables in this thesis, and the techniques used in statistical analysis.

### 2.2 Theoretical Connections to the Whitehorse Context

A review of the literature on environmental beliefs found empirical evidence that society is shifting away from a technocratic and toward a more environmentally friendly, or ecological, world-view (e.g. Van Liere and Dunlap, 1980, Olsen et al. 1992). A review of the literature on New Institutional Analysis found that institutions influence the beliefs of their members (e.g. DiMaggio and Powell, 1983; March and Olsen, 2005; Ashworth, 2009). A review of the literature on the causes of pro-environmental behaviour found a strong connection between beliefs and norms in predicting environmentally responsible actions (e.g. Stern, 2000; Schultz et al., 2005). Last, the literature review found that certain sociodemographic variables, such as age, gender, income, and education that were previously thought to influence environmental orientation are not consistently significant predictors of pro-ecological world-view, with the possible exception of income.

It is important to understand if there are social forces at work among those responsible for making decisions that will affect the capacity of the City of Whitehorse to adapt to potential climate change impacts. Identifying these social forces will contribute to an understanding of how policy decisions are being made and how they may be made in the future. This can lead to the identification of facilitators and barriers to climate change adaptation and help enhance the adaptive capacity of the City.

The present study is a part of a greater case study within the CAVIAR research network. It is specifically aimed at reducing vulnerabilities within the City of Whitehorse to potential future environmental change. The CAVIAR network is an International Polar Year (IPY) initiative focused on understanding and enhancing the capacity of northern communities in all Arctic countries to deal with social, economic and ecological changes related to the current and expected impacts of climate change. The Whitehorse case study has a specific focus on understanding the process of governance and identifying the key institutional linkages and relationships that may influence near-term adaptive strategies and future adaptive capacity.

The Whitehorse CAVIAR case study investigates how decisions are made through an examination of the institutional structure of the organizations under study, the City of Whitehorse and the Yukon Territorial Government (YTG). The research in this particular related project will investigate the influence of informal social pressures operating within that same institutional structure, termed the

“shadow system” by Stacey (1996). Both the formal and informal relationships within institutions must be considered in institutional analysis (Pelling and High, 2005). By investigating the institutional influence on environmental beliefs this project accounts for both formal and normative behaviour-guiding structures. This project will compliment the larger Whitehorse CAVIAR case study by examining if the culture of institutions influences the personally held environmental beliefs of their members and if and how these beliefs affect policy decisions regarding the sustainability and the environment.

If an institutional influences the personal environmental beliefs of its members to resemble one another it is likely that, as the literature review pointed out, norms have developed constraining the behaviour of actors so as to conform to institutional expectations. Given that a diversity of perspectives can enhance adaptation (Adger, 2001; Berkes et al. 2005:225), a relatively homogeneous cluster of environmental beliefs within one organization may reduce adaptive capacity by limiting the options considered for adaptation. Similarly, different, yet conflicting, beliefs within or between organizations can create a barrier for adaptation by creating disagreements that can delay the implementation of adaptation measures (Malalingham and Levitt, 2006). These delays can be considered barriers to adaptation because institutions must be able to keep pace with environmental changes to effectively deal with the threats posed by a changing climate (Portes, 2006:235).

Addressing potential barriers to climate change adaptation presented by the environmental beliefs of members of the City of Whitehorse and the YTG will compliment the more structural institutional analysis of the CAVIAR case study. Together, these studies will present those with decision-making authority regarding climate change adaptation in Whitehorse with a comprehensive assessment of the institutional facilitators and barriers to adaptation.

As discussed in the introduction, an ICSP is a policy document intended for use by municipalities that sets out, “their values and defines environmental, cultural, social and economic objectives” (YTG, 2007:webpage). As discussed in the introduction, the Whitehorse ICSP was developed with input from many staff members and the community. It outlines the valued aspects of the community and the beliefs articulated by those involved in the development process. As such the ICSP presents a unique opportunity to evaluate how beliefs are reflected in policy decisions regarding the environment. There is a wide array of beliefs discussed in the plan and potential areas of investment and measures or success accompany many of these. It is unlikely that all these areas can receive funding. Thus, decision-makers will have to select a set of projects to financially support, reflecting a particular set of beliefs and values. In this study we seek to identify the beliefs of decision-makers and high-level staff of Whitehorse and YTG. We will then evaluate the connection between their beliefs and the projects (and their accompanying associated beliefs) selected for funding.

A particular set of beliefs among decision-makers can potentially influence the projects selected for funding. If the projects selected are not aligned with the beliefs of the community or staff, this could cause conflict over whether or not the chosen projects are helping the city become more sustainable. Also, if there is an institutional culture among decision-makers promoting a particular set of beliefs, beliefs contrary to those may not be tabled for discussion. This could result in the selection of projects based on a belief system rather than a more objective appraisal of best practice. This lack of diversity in beliefs among decision-makers could reduce adaptive capacity by causing potentially helpful projects to be overlooked in favour of those that better reflect accepted practices.

The City of Whitehorse has a small tax base and, as described in the introduction, requires funding from, and cooperation with, the YTG to develop and maintain its infrastructure. The ICSP is an initiative requiring YTG funding and implementation by the City. As mentioned in the introduction, the City views sustainability (and encapsulated within it, climate change adaptation) within the context of the ICSP. Thus, this study has two principal foci: (1) to identify the endemic institutional culture of the City; and, (2) to examine the relationship between the institutions of the City and the YTG. Each are explained below.

Our analysis of the institutional culture of the City is focused on four main components: (1) the beliefs of individuals; (2) the institutional culture influencing individual beliefs; (3) how are beliefs reflected in the ICSP; and, (4) if there are

differences in beliefs that could lead to barriers to responding effectively to environmental issues.

We are interested in the influence of groups on the beliefs of individuals because of the relationship between beliefs, norms, and actions discussed in the literature review developed in Chapter 1. The relationship between the beliefs of individuals, the types of actions they take, and whether or not they take action, is often influenced by social context (Stern, 2000:415). Prevailing norms within one's reference group are a strong influence on beliefs. The types of environmental beliefs held by employees of the City could potentially influence City policy regarding challenges with an environmental dimension such as sustainability and climate change. If there is a particular institutional culture promoting a set of norms regarding environmental orientation, this could affect the types of decisions made to address these issues. We will explore how beliefs affect policy by examining the relationship between environmental beliefs and the implementation of the ICSP. This is discussed in-depth later on in this Chapter.

Institutions often influence the beliefs of their members, sometimes strongly, as discussed in our literature review. The City of Whitehorse presents an image as a sustainability-oriented city and has been addressing the issue for a number of years (Cabott, 2007:5). Thus, it is possible that there are social forces at work within the culture of the City that are molding the beliefs of employees to conform to the institutionally championed view of sustainability. These views may or may not inhibit adaptation. This point is also discussed later in this Chapter.

Sustainability and climate change issues within Whitehorse are often discussed in the context of the ICSP. This study is a part of a greater CAVIAR study aimed at addressing issues of adaptation to environmental change. Given these two points, examining how environmental beliefs are reflected in the ICSP allows this study to address issues of adaptation to environmental change within a local context. The ICSP is a policy medium through which, due to broad staff involvement in its creation, it is possible to gain insight into how staff beliefs are reflected in policy. By asking staff their opinions regarding their perspectives on the ICSP it may be possible to identify whether or not differences of opinion regarding the ICSP are divided along the lines of environmental beliefs.

Differences in beliefs among City staff, whether from differences in “buy-in” to a City-advocated view of the environment and sustainability or otherwise, could present potential barriers to climate change adaptation. Our literature review found that differences in beliefs could be an underlying cause of some disagreements on certain aspects of projects. It also revealed that social actors within institutions are often not willing to propose ideas that go against generally accepted viewpoints. Similarly, a homogeneous set of beliefs could lead to staff overlooking potential solutions to a problem due to a tendency to favour a particular solution that fits well within the institutional culture. These last two possibilities could reduce the diversity of perspectives on potential projects, decreasing adaptive capacity.

The analysis of the relationship between the institutions of the City and the YTG is focused on differences in environmental beliefs. If City and YTG employees differ markedly in their environmental beliefs it is possible that Whitehorse may encounter difficulties in receiving funding from YTG under the Gas Tax agreement for particular projects they may see as needed. This may be due to conflicting ideas regarding what are appropriate projects for Territorial funding and potential delays or lack of funding for needed projects could inhibit adaptation.

Given the major themes presented by the literature review, the local context of this study, and its fit within the framework of the larger CAVIAR study, this project will address the following hypotheses:

1. Social forces operating within each institution examined will lead the environmental beliefs of their members to resemble one another more than the beliefs of individuals in other organizations.
2. These same social forces will lead the environmental beliefs of veteran employees to resemble one another more than novice employees.
3. Socio-demographic variables will have less influence than institutions on the values and beliefs of participants.
4. Environmental beliefs will be reflected in definitions of sustainability. These definitions of sustainability will affect how the Integrated Community Sustainability Plan (ICSP) is perceived and the degree to which respondents believe sustainability is possible in Whitehorse.

### 2.3 Research tools

Data were collected through interviews, a questionnaire, and a short-answer mail-in survey. How each tool fits into the greater CAVIAR study, how they were developed, and how they serve to operationalize the focus of this study is

discussed below in detail. Before describing each tool in detail it is useful to present the general conceptual model that informed the creation of each tool.

The ICSP was chosen as the topic by which we would introduce our study questions to respondents. We did so because the review of background documents and the preliminary interviews revealed that it is the current context in which employees of the City of Whitehorse discuss sustainability, environmental issues, and planning for the future of their city.

Before we discuss the general conceptual model regarding the selection of our research tools it is useful to review the ways nature is generally valued, given the influence of values on beliefs (Stern et al. 1995:726-727). This review provides justification for the construction of categories of environmental beliefs used in this study, which will be discussed next as part of the general conceptual model.

The way humans value nature can be approximated using the ecosystem services concept as an example. Ecosystem services are the services nature provides people for "free," such as pollination and the provision of natural resources (Daily, 1997), and an extensive literature exists on their valuation. The valuation of ecosystem services encompasses a broad array of human values for nature ranging from physical resources such as timber to aesthetic resources such as pleasant scenery (Constanza et al. 1997; Daily et al., 2000; Helliwell, 2001; Kawachi, 1999). Valuation includes both instrumental and intangible values. Instrumental values are predominantly utilitarian and are valued based on

their economic contributions to human society. This is done using either a direct assessment of the market value of a good, like timber, or an indirect assessment of the value of a non-market good, like many non-timber forest products (NTFPs), by using similar goods that are traded in a market (Delang, 2005:71). Intangible values such as recreation are typically valued by assessing travel cost or by using contingent valuation methods such as surveys of willingness-to-pay or willingness-to-accept a particular amount of money for the preservation of, or in compensation for the loss of, a particular service. Spiritual values for nature, or the intrinsic value of nature itself, is extremely difficult, if not impossible, to assign value (Berkes and Jolly, 2001; Costanza et al., 1997).

It is important to note that valuation reflects prices more than actual value or importance (Heal, 2000:111-112). For the purposes of this project the relevance of the ecosystem services example is not so much in how nature is valued but how is it *compartmentalized* for valuation and how this categorization of nature reflects the socially constructed categories in which we value our environment. Nature is valued for its own intrinsic worth, as a source of "invaluable" spiritual and inspirational qualities, as a place of recreation, and as a source of needed resources. To fully understand environmental beliefs it is important to keep in mind the way nature's value is socially constructed and to allow for environmental beliefs to be measured in different categories. It is important that research into environmental beliefs adequately reflect the different ways we value our environment.

We examined the literature on environmental beliefs to determine what value categories would be used in our analysis of beliefs. We selected five categories of environmental orientation to help us understand respondents' beliefs and values regarding nature; technocratic beliefs, biospheric beliefs, altruistic beliefs, the degree to which respondents accept that humans benefit from nature, and that humans must live in balance with nature.

We selected technocratic and biospheric beliefs following Olsen et al. (1992). These are the two categories of beliefs that proponents of the New Ecological Paradigm argue form dominant paradigms in contemporary society. As discussed in Chapter 1, many authors believe that society is transitioning from a technocratic industrial worldview to a more biospheric, ecological worldview. Technocratic beliefs fit within the industrial worldview described by Olsen et al. (1992:1-10). Tim O'Riordan coined the term 'technocratic' in 1976 and suggested that it was the dominant ideology of the day (Olsen et al. 1992:33). Technocratic beliefs are characterized by the belief that human ingenuity can either solve environmental problems or, that regardless of the state of the global environment human technology will allow us to continue to maintain our quality of life. Biospheric beliefs are the core of what Olsen et al. (1992) describes as the ecological or post-industrial worldview, forming the New Ecological Paradigm. These beliefs are centered on the notion that humans are a part of the natural world. These beliefs not only hold that the environment has intrinsic worth, but that our interests are encapsulated with those of nature since our quality of life depends on the integrity of the natural world.

Schultz (2001) and Schultz et al. (2005:457) describe altruistic beliefs as beliefs that show concern for plants and animals. They are similar to the biospheric beliefs described by Olsen et al. (1992) although with two main differences. Altruistic beliefs do not require the holder of the belief to believe that humans are a part of the natural world, and they also do not require believers to agree that human interests are encapsulated with those of the environment. For the purposes of our study altruistic beliefs are defined as selfless concern for plants, animals, and the natural world.

We developed the category 'the degree to which respondents accept that humans benefit from nature' to expand upon a specific dimension of the biospheric beliefs described by Olsen et al. (1992). This category differs from the biospheric category in that it examines beliefs regarding the influence of the environment on specific categories of anthropocentric benefits.

We developed the category 'humans must live in balance with nature' to further expand on biospheric beliefs as described by Olsen et al. (1992). This category explores the degree to which respondents believe their behaviours are negatively impacting the environment.

We examined environmental orientation using the New Ecological Paradigm (NEP) scale (Olsen et al., 1992) and the other three measures discussed above. As discussed in Chapter 1, the NEP focuses on beliefs about the relationship

between humans and nature. It is the most widely used measure of environmental concern (Stern et al. 1995:725) and is an accepted measure of ecological world-view with predictive and criterion validity (Dunlap et al. 2000:429). A high NEP score “should lead to pro-environmental beliefs and attitudes on a wide range of issues” (Dunlap et al. 2000:428). It is being supplemented with a measure of altruistic beliefs, the perceived personal and social benefits individuals receive from nature, and the belief that nature is affected by our activities, in order to better account for the three types of environmental attitudes described by Schultz (2005:459), egoistic, social-altruistic, and biospheric. The NEP and environmental attitudes described by Schulz (2005) form a relatively comprehensive representation of environmental beliefs, as defined by our review of the literature.

Employees of the City of Whitehorse and the YTG come from a variety of backgrounds. As discussed in the introduction institutions likely influence beliefs, and the effect of group membership (via group norms) on personally held environmental beliefs has received little attention. Given that relationships have, at times, been found between socio-demographic variables and environmental beliefs, it is important to control for these variables in analysis. The literature on environmental beliefs suggests that potential influences on personally held environmental beliefs include age, gender, income, education, and the time spent working within other institutions. Although we do not expect these variables to be similarly related to beliefs, we will control for these factors in our analysis of the intra-institutional influences and inter-institutional differences in environmental

orientations. A brief description of present state of the literature on each of these variables is provided below.

Age has been found to be a predictor of environmental concern in several studies (Jones and Dunlap, 1992:38; Van Liere and Dunlap, 1980:190) and is typically negatively correlated with environmental concern (Torgler and Valinas, 2007:537) and pro-environmental action (Poortinga et al., 2004:86).

Over the past several decades gender has been a salient issue in research of environmental beliefs. Proponents of ecofeminism have suggested that "women have, as an inherent quality, a privileged relationship with nature" (Eichler, 1999:195). However, research through the 1980's found, "no agreement on the direction of the relationship between sex and environmental concern" (Van Liere and Dunlap, 1980: 186). More recent studies have suggested that, while women "are more accepting than men of messages that link environmental conditions to potential harm to themselves," they do not assign substantially different weights to those beliefs than men (Stern et al. 1992:340). Throughout the 1990's, however, a literature review revealed that in nine out of 13 studies women were found to be, "significantly more active in pro-environmental behaviors than men, three found no statistically significant difference between males and females, and one study reports a greater participation of men" (Torgler and Valinas, 2007:538). More recent studies, however, have again found mixed results, calling into question the role of gender in environmental orientation (Torgler and Valinas, 2007:538).

A consistently positive relationship between income and environmental beliefs and behaviours can be found over the past several decades (Poortinga et al. 2004:86; Torgler and Valinas, 2007:538). These findings are not universal, however, as at least one major study found no correlation between these variables (Olsen, Ludwick, and Dunlap, 1992:50).

Education has been hypothesized to be positively correlated with environmental concern. For example, Jones and Dunlap (1992:38) found education to be one of the next best predictors of environmental concern after age. However, this finding is not consistent. For example, Olsen et al. (1992:52) found education was not significantly related to holding a New Ecological Paradigm over a more traditional, technocratic one. A review of 21 studies throughout the 1970's found education level to be positively correlated with environmental concern (Van Liere and Dunlap. 1980:189). The same results were found in a literature review of studies conducted in the late 1990's and early 2000's (Torgler and Valinas, 2007:538) and today it is generally accepted that there is a relationship between income and environmental beliefs.

The categories of environmental beliefs described earlier in this section (technocratic beliefs, biospheric beliefs, altruistic beliefs, the degree to which respondents accept that humans benefit from nature, and that humans must live in balance with nature) formed the basis of our questionnaire and a section of both the interview schedule and the mail-in survey. The literature discussed

above regarding potential demographic influences on environmental beliefs serves as the basis for the demographic section of our questionnaire. We included the number of years worked with the present employment organization and the number of years worked within another organization to test the effect of institutional pressures on environmental beliefs. As discussed in the beginning of this section, the CAVIAR case study of which this project is a part focuses on understanding the process of governance. The interview schedule developed for this study is aimed at expanding upon the CAVIAR interviews to include a focus on environmental beliefs, to examine staff perspectives of the ICSP, and explore how environmental beliefs may affect these perspectives.

Due to scheduling and funding constraints, interviewing enough participants to get an adequate sample size for statistical analysis was not possible. For this reason the interview schedule was re-formatted into a mail-in short answer survey. We eliminated two questions from the interview schedule in the survey to decrease its length in an attempt to garner a higher response rate. The eliminated questions examined the institutionalization of responsibilities regarding the ICSP (items #4 and #5 of the interview schedule). These were chosen for elimination because they did not address issues of environmental beliefs or how these beliefs relate to perceptions of the ICSP. The eliminated questions were subsequently added to the CAVIAR interview schedule.

Both the interview schedule and survey consisted of two sections, one covering the Whitehorse Sustainability Plan, and one covering personal perspectives on

sustainability. The interview schedule consisted of nine questions and the survey consisted of seven. The interview schedule can be found in Appendix A, and the questions asked in the survey can be found in Appendix B.

Our interview schedule and survey (see Appendices A and B) were developed to investigate connections between environmental beliefs and perspectives on the ICSP. Both the schedule and survey began with questions about a participant's general understanding of the ICSP. Each then proceeded with questions about the strengths and weaknesses respondents perceive in the plan, whether or not they see it as useful, needed, or realistic. The second section asked respondents to define what the concept of sustainability means to them. This was followed by questions regarding whether or not they believe sustainability is a part of their workplace culture, the culture of Whitehorse in general, and if they believed sustainability is possible in Whitehorse. The purpose of these questions was to evaluate the effects of environmental beliefs on definitions of sustainability, and to examine the relationship between these beliefs and perceptions of the ICSP. It also served to permit an analysis of the influence of environmental beliefs on one's perception of local cultures of sustainability and the potential for Whitehorse to succeed in becoming sustainable.

Upon completion of the interview or survey, participants were presented with a questionnaire asking about their environmental beliefs. This questionnaire consisted of 23 items each representing one of the five environmental orientation

categories defined above. Questions examining altruistic and technocratic beliefs were taken directly from Olsen et al. (1992). Although we used Schultz (2001) to define altruistic beliefs, Olsen et al.'s (1992) questionnaire for the New Ecological Paradigm included items on this dimension of beliefs. To remain consistent with the Olsen et al. (1992) NEP scale we asked respondents to indicate their personal belief using a five-point scale. This scale ranged from strongly agrees, mildly agree, undecided, mildly disagree, to strongly disagree. Questions regarding the other three environmental orientation categories were either taken directly from Stern et al. (1993:335), modified from the New Ecological Paradigm questionnaire from Olsen et al., (1992), or created to address specific questions relating to this study. The questions created for this study are discussed next. We used a six-point scale for these questions so that respondents would not be forced to choose between strong and mild beliefs but would be given the option of expressing moderate beliefs as well. This scale also allowed us to avoid responses of 'undecided.' We felt that this was acceptable since adding a moderate belief dimension would give less weight to the 'mildly' response category. This would allow it to include 'undecided but leaning toward' agreement or disagreement since there is likely a range among 'undecided' responses that is not expressed by a five-point scale. The six-point scale ranged from strongly agrees, agree, mildly agree, mildly disagree, disagree, to strongly disagree. Response trends for each of our survey instruments can be found in Table 2.1.

**Table 2.1: Response Trends by Survey Instrument**

| Instrument | # Contacted | # Respondents | Response Rate |
|---|---|---|---|
| Interviews | 10 | 10 | 100% |
| Interviews with Questionnaire | 21 | 14 | 67% |
| Mail-in Survey and Questionnaire | 98 | 26 | 26.50% |
| Total | 131 | 50 | 39.80% |

Five questions were created specifically for this study. They are items #8, 9, 10, 13 and 14. The full questionnaire can be found in Appendix C. Of these five questions only items nine and ten were retained for analysis so only these items will be explained here. The process for eliminating items during analysis will be explained later in this chapter. Question nine asked, “although climate change will have a considerable impact on small rural communities in the North, Whitehorse will be relatively sheltered from climate change effects.” The purpose of this question was to serve as a measure of perceived threat from climate change. Value-Belief-Norm Theory (Stern, 2000) hypothesizes that individuals will act to mitigate the impact of a threat to a valued object when they perceive that it is within their power to reduce that threat. This item was included so that we could measure if perceived local climate change threat is related to any of our environmental orientation categories. This would allow us to measure if perceived climate change threat is related to specific opinions regarding the ICSP.

Item 10 reads, “Part of sustainability is making our community a better place to live” and was added as an additional indicator of biospheric beliefs. The purpose of this question was twofold; to provide a measure of perceived anthropocentric benefit from reducing human impact on the environment, and to determine if the community focus of sustainability articulated by the Whitehorse ICSP was shared by employees of YTG.

The final section of the questionnaire asked respondents to identify their demographic characteristics. This information allowed us to control for the potential influence of demographic factors, as discussed above. We also included questions regarding employment history. This facilitated our analysis of how social forces within institutions shape the beliefs of members by allowing us to not only make inter-institutional comparisons of beliefs (City vs. YTG) but intra-institutional comparisons as well (by comparing time worked within an institution to beliefs).

The research tools developed for this study provide us with both quantitative and qualitative measures of environmental beliefs and permit comparison between these beliefs and perspectives of the Whitehorse ICSP. Our interviews and survey allow us to compare the relationship between individually held beliefs and perspectives on the ICSP. This will allow us to investigate how environmental beliefs are influencing the implementation of the ICSP and if they are presenting any barriers to climate change adaptation. The questionnaire we constructed allows us to measure differences in beliefs across and within institutions and

helps us detect if institutional pressures within the institutions studied are influencing the beliefs of their members.

### 2.4 Study Participants

The CAVIAR case study focused on the decision making structure of the governance institutions within Whitehorse. As discussed above, this study aims at expanding the CAVIAR analysis by focusing on how environmental orientation may affect governance decisions and actions with respect to climate change. For this to be successful we targeted the same participants for our study that were involved in the CAVIAR project. To be able to identify how environmental beliefs potentially influence decisions regarding the ICSP we needed data from participants involved in the decision making process and those who would be involved in implementation on the ICSP projects. For this reason, only mid- to high-level staff was contacted, as described above in the criteria for selection.

Despite a low response rate, participants in this study form a sample large enough for the statistical analysis we performed. Respondents from the City of Whitehorse make up 32 out of 62 employees identified on the City of Whitehorse internal phone list and seven elected officials who do not appear on the list. The total pool of potential contacts from Whitehorse is 69 individuals and our respondents make up 46.4% of the target population. Respondents from the Yukon Territorial Government make up 26 out of 66 employees identified on the Yukon Government's Community Services telephone directory, plus an additional

six staff interviewed for the CAVIAR project, for a total of 36% of the target population.

Participants recruited for this study were elected government officials, non-elected civic decision makers, and professional staff from both the City of Whitehorse and the Yukon Territorial Government. These officials were selected because they have decision-making authority over the selection and implementation of ICSP projects for Whitehorse. In October, 2007, we conducted 10 informal preliminary interviews in Whitehorse with several Councilors, the Mayor, and several members of the engineering and planning departments. Discussions with our preliminary contacts revealed additional potential interviewees. We also attended a public planning session for sustainability called a “Sustainability Planning Charette.” The Charette was an event where members of the community met with City planners to comment on the ICSP.

We obtained an internal phone list for the City of Whitehorse. Forty-six individuals named on the list were contacted. Employees involved with the Canada Games Centre and the Canada Games Customer Service department were excluded.

The ICSP template was developed by the Community Services department of the YTG. We used the Yukon Government’s telephone directory for the Community Services department to identify staff fitting the criteria outlined above. We selected the Community Services department because staff from this department

is the most likely to have knowledge of the Whitehorse ICSP since they are in charge of the ICSP process for the Territory.

### 2.5 Sample characteristics

All participants were initially contacted by mail with a letter explaining the nature of the study. Contacts were encouraged to reply via e-mail to arrange interviews. The Mayor and Councilors as well as members of the Planning & Development and Engineering & Environment departments were selected for our first round of formal interviews that took place in Whitehorse, Yukon, in February 2008. This first round of interviews employed an interview schedule developed for the CAVIAR project. I conducted a second round of interviews in Whitehorse in November 2008 expanding the focus to include additional members of the Planning & Development and Engineering & Environment departments as well as members of the Operations Division, the Fire Department, Parks and Recreation, and Public Works departments. I also followed up with participants that we interviewed using the CAVIAR interview schedule in February. Interviews with these personnel were conducted using the new interview schedule described in this section. All participants I interviewed received a copy of the questionnaire described above. My research supervisor conducted interviews with members of the Yukon Territorial Government at the same time for the Community Adaptation and Vulnerability in Arctic Regions (CAVIAR) study and distributed copies of this study's questionnaire.

Following the November round of interviews, we reformatted the interview schedule into a short-answer survey, as discussed above. Ninety-eight copies were mailed along with the questionnaire to the remainder of our identified sample population in mid-January 2009. We sent out one set of follow-up surveys in late-February 2009. Our mail-in survey received 26 responses for a response rate of 26.5%.

We received at total of 50 usable responses, including interviews with 17 individuals and 26 completed questionnaires. Information on response rates is shown in Tables 2.2 and 2.3.

**Table 2.2 Numerical Distributions of Respondents**

| | Whitehorse | YTG | Total |
|---|---|---|---|
| Respondents | 33 | 17 | 50 |
| Males | 17 | 10 | 27 |
| Females | 16 | 7 | 23 |

**Table 2.3 Percentage Distributions of Respondents**

| | Whitehorse | YTG | Total |
|---|---|---|---|
| Respondents | 66% | 34% | 100% |
| Males | 52% | 59% | 54% |
| Females | 48% | 41% | 46% |

## 2.6 Research Design

Data sets were constructed in Microsoft Excel and statistical analysis was performed using SPSS, G Power 3, and Microsoft Excel. The initial phase of analysis focused on identifying the survey questions within each environmental orientation category that are most useful for analysis. The first step in this process was to conduct a factor analysis on the 23 responses to the

questionnaire and the demographic data. As is common in factor analysis, only factors with Eigen values higher than 1 were retained for analysis. Survey questions were then grouped into components using a rotated component matrix. The question groupings were then examined for consistency using correlation coefficients and verified with p-values. Questions that did not appear to fit thematically within their component and had low, non-significant correlations with the other survey items in the group were removed. This process was repeated three times (for a total of four factor analyses) until only thematically consistent and significantly correlated survey responses remained within each component. Each component represents one environmental orientation category. The questions used in the creation of each component are found in Table 2.4.

**Table 2.4: Classification of Questionnaire Items Used for Components**

| Component Title | Questionnaire Items Making Up Component |
|---|---|
| Biospheric | 2, 3, 10 |
| Human-Environment Connectedness | 4, 7, 23 |
| Human Benefits from Nature | 1, 6, 12 |
| Altruistic Beliefs | 18, 19 |
| Technocratic Beliefs | 20, 22 |
| Institutional Affiliation | (response to question on inst. Affiliation) |

Following Olsen et al. (1992) an index was then created for each response category (after being filtered by factor analysis) following three steps. (1) Responses to 6-point Likert items were recoded as 'strongly agree,' 3 points; 'agree,' 2 points; and 'mildly agree,' 1 point. For 5-point Likert items responses were recoded as 'strongly agree,' 2 points; and 'agree,' 1 point. All other responses in each scale were given a score of zero. We applied scores of zero

because we are interested in the degree to which individuals hold a particular belief. We did not score disagreement because we did not want disagreement on one item of an environmental orientation category to dilute agreement scores for other indicators within that same category. Also, our questions were not paired in such a way that would necessitate the use of disagreement in index scores. For example, we do not have pairs of technocratic and anti-technocratic questions that are members of the same environmental orientation category. Points were then summed to create a scale for each indicator (scales ranged from 0-6 points to 0-12 points).

(3) Each scale was then divided into thirds, each representing a meaningful category (the first third represents strong belief, the middle third represents moderate belief, while the bottom third indicates weak belief). Scores of zero represent non-belief. Dividing scores into thirds is an arbitrary measure. Olsen et al. (1992) divided their scores into thirds as well, with the top third representing strong belief, the middle third representing weak belief and the bottom third representing non-belief. Since the majority of our questions were from a six-point scale we chose to use three categories of belief for our index scores to maintain consistency with the questionnaire. Results were presented as a table comparing the different categories of respondents with their index scores divided into environmental orientation categories.

Creating index scores for each environmental orientation category facilitated comparison among different groups of respondents. By eliminating negative

(disagree) responses we were able to make comparisons strictly on the basis of the degree to which participants agree with particular sets of beliefs. The classification of scores into categories (grouped into thirds representing different degrees of belief) allows for important distinctions to be made regarding the extent to which groups of respondents ascribe to a particular category of belief.

Following our quantitative analysis we focused on our qualitative data. We began by coding responses to the question, “what is you understanding or perception of what sustainability is/means?” so that responses could be grouped into one of our five environmental beliefs categories. Responses were considered technocratic if they focused on technological dimensions such as improving efficiency of buildings and vehicles and developing alternative energy sources. Biocentric responses were those focused on, for example, encapsulated interest among humans, including future generations, and the environment and a recognition of limits to growth. Responses were considered altruistic if sustainability was defined as something humans must do to protect the natural world for its own sake. Responses were classified into the category ‘humans benefit from nature’ if the view of sustainability they articulate is primarily focused on anthropocentric benefits. Last, responses were considered a part of the ‘humans must live in balance with nature’ category if they discuss tradeoffs that must be made between humans and nature.

We coded participant’s definitions of sustainability in this way for two reasons. The first is to evaluate whether definitions of sustainability are consistent with

environmental beliefs as measured by the questionnaire. Second, classifying respondent's definitions of sustainability into these categories allowed us to evaluate the effect of personal definitions of sustainability on individual's perceptions of the ICSP in a way that meaningfully reflects our findings on environmental beliefs. This way, we would be able to investigate whether or not differences in environmental beliefs within and between organizations will potentially create a barrier to adaptation by affecting the way groups of respondents view the ICSP. This could create a barrier if different groups of respondents have different views of the purpose of the ICSP and its present chances of success. These types of differences in perception of the ICSP could potentially create conflict leading to delays.

We then coded responses to the questions regarding the culture of sustainability and the possibility to be sustainable in Whitehorse, and responses to the questions in the first section of the interview and survey regarding participant's general understanding and perception of the ICSP. Questions were coded according to major themes in responses that appeared in a review of our responses. The codes for each question are presented in Appendix D.

Responses to this last set of questions were grouped according to the environmental orientation category of the participant that provided them based on their definition of sustainability. This allowed us to compare both differences in perceptions of the ICSP, and belief in the potential for Whitehorse to be sustainable, based on environmental beliefs. We displayed the results of this

analysis in two tables. The first presents the relationship between perceptions of the ICSP and environmental orientation. The second demonstrates the relationship between particular beliefs regarding the sustainability potential of Whitehorse and environmental orientation. This allowed us to determine if differences in environmental beliefs affect perceptions of the ICSP and if these differences are differ by group among respondents. If these responses are divided among particular groups of respondents these differences of opinion could potentially represent a future barrier in adaptation by creating disagreements and causing delays. Coding based on major themes present in our responses also allowed us to account for the possibility of potential barriers to the implementation of the ICSP not covered by our analysis of environmental beliefs.

This analysis was followed by a general discussion of the perception of the ICSP and the sustainability potential of Whitehorse from the perspective of both employees of the City and the YTG. Proceeding this discussion results are summarized and the implications of this study for climate change adaptation in Whitehorse are discussed.

### 2.7 Summary

This section described the research instruments designed for this study and located them within the greater research literature and the larger CAVIAR Whitehorse case study of which this project is a part. It also identified the general characteristics of the population from which we drew our sample. We presented

an outline of the analysis that will be the focus of the next Chapter for both quantitative and qualitative data.

## Chapter 3: Environmental Orientations of Employees of the City of Whitehorse and the YTG

### 3.1 Introduction

This chapter will present and discuss the results of our analysis of quantitative data regarding workplace beliefs. The purpose of this Chapter is to determine if there are any institutional trends in beliefs, to determine if there are institutional differences in beliefs, and to assess whether or not there are patterns of institutional cultural norms that may be influencing the beliefs of employees of the City of Whitehorse and the YTG. This Chapter begins with an examination of the socio-demographic and environmental orientation characteristics of the sample of respondents from the City of Whitehorse and from the Yukon Territorial Government (YTG). It proceeds to present our data on environmental beliefs for each organization and discuses their implications. We then discuss the results of our analysis of control variables we used to ensure our data were not confounded by potential demographic differences among respondents. This Chapter concludes by comparing the beliefs of novice and veteran employees to establish whether institutional trends in environmental orientation are the result of chance or an institutionally specific cultural model.

Our review of the literature found that social forces operating within institutions can influence the beliefs of their members. Our review also highlighted the hypothesis presented by Olsen et al. (1992) that society is divided between two competing social paradigms, a technocratic post-industrial world-view, and a new

pro-ecological world-view. Last, the literature review found that certain socio-demographic variables, have the potential to influence environmental orientation.

Assessing environmental beliefs can help reveal potential biases individuals may have regarding how climate change adaptation should be approached. For example, an individual with technocratic beliefs will be more likely to believe that the best way to address climate change is to wait until specific environmental changes present a threat, then use technological interventions to address it. On the other hand, an individual with non-technocratic beliefs will be less confident in humanity's ability to use technology to address environmental changes. As such, they may be more willing to act now to address potential future changes through non-technological interventions such as undertaking land-use planning with potential future environmental conditions in mind. We are not interested in environmental beliefs at an individual level but rather at the level of the institutions under study. Understanding the environmental orientation of the City and YTG will allow us to predict how each institution will approach climate change adaptation. This Chapter will examine three of the hypotheses presented in Chapter 2:

1. Social forces operating within each institution examined will lead the environmental beliefs of their members to resemble one another more than the beliefs of individuals in other organizations.

2. These same social forces will lead the environmental beliefs of veteran employees to resemble one another more than novice employees.

3. Socio-demographic variables will have less influence than institutions on the values and beliefs of participants.

### 3.2 Distribution of Socio-demographic variables

Before proceeding with a discussion of the analysis, it is useful to examine the characteristics of the sample population. The demographic characteristics of the sample can be found in Table 3.1.

**Table 3.1**

**Percentage Distribution for Socio-demographic Characteristics of Respondents**

| | | Number of Respondents | % of YTG Respondents | % of City Respondents | % of Overall Respondents |
|---|---|---|---|---|---|
| **Institutional Affiliation** | | 50 | 34.0 | 66.0 | X |
| **Gender** | **Males** | 50 | 62.5 | 56.6 | 54.0 |
| | **Females** | | 37.5 | 43.4 | 46.0 |
| **Education** | **High School** | 48 | 6.3 | 13.8 | 10.4 |
| | **Some University / College** | | 0 | 13.8 | 10.4 |
| | **Bachelor's Degree** | | 68.8 | 50.0 | 62.5 |
| | **Master's Degree** | | 18.7 | 13.8 | 14.6 |
| | **PhD** | | 6.3 | 0 | 2.1 |
| **Annual Personal Income** | **< $20 000** | 46 | 0 | 0 | 0 |
| | **$20 000 to $39 999** | | 0 | 10.3 | 6.5 |
| | **$40 000 to $59 999** | | 20.0 | 24.1 | 21.8 |
| | **$60 000 to $79 999** | | 26.6 | 41.4 | 34.8 |
| | **$80 000 to $99 999** | | 26.6 | 3.5 | 15.2 |
| | **> $100 000** | | 26.6 | 20.1 | 21.8 |

**(continued on next page)**

**Table 3.1 (cont.)**

**Percentage Distribution for Socio-demographic Characteristics of Respondents**

| | | Number of Respondents | % of YTG Respondents | % of City Respondents | % of Overall Respondents |
|---|---|---|---|---|---|
| **Years Worked for Present Organization** | **Less than 5** | 48 | 35.3 | 63.3 | 37.5 |
| | **5 or more** | | 64.7 | 36.6 | 62.5 |
| **Years Worked for Another Organization** | **0** | 40 | 7.1 | 25.0 | 20.8 |
| | **Less than 5** | | 14.2 | 16.7 | 16.1 |
| | **More than 5** | | 78.6 | 58.3 | 63.0 |
| **Age** | **< 25** | 41 | 0 | 0 | 0 |
| | **26 to 35** | | 13.3 | 18.5 | 17.1 |
| | **36 to 45** | | 26.6 | 23 | 24.4 |
| | **46 to 55** | | 46.6 | 38.5 | 41.5 |
| | **> 55** | | 13.3 | 23 | 19.5 |

### 3.3 Institutional Trends in Environmental Beliefs

This section will examine the environmental orientations of employees of both the City and YTG. It begins by providing a summary of the general trends in environmental orientation of our respondents. It then discusses differences in environmental beliefs among institutions to assess how each may approach potential future climate threats. It concludes by presenting our analysis of control variables to determine if our results are being confounded by demographic variables that have the potential to influence environmental orientation.

### *Environmental orientation trends by institution*

Table 3.2 demonstrates how strongly respondents subscribe to the beliefs encapsulated within our environmental orientation categories. As discussed in Chapter 2, these categories can be considered as indicators of environmental orientation (Olsen et al. 1993; Schwartz et al. 2005). Index scores were calculated for each participant following the framework put forward by Olsen et al. (1993) as discussed in Chapter 2.

**Table 3.2**

**Percentage Distribution of Responses To Survey Questions by Category**

**Overall**

| Environmental Orientation Category | % Strong Holders | % Moderate Holders | % Weak Holders | % Non Holders |
|---|---|---|---|---|
| Altruistic Orientation | 22 | 40 | 18 | 19 |
| Technocratic Orientation | 0 | 6 | 21 | 72 |
| Biospheric Orientation | 23 | 44 | 18 | 15 |
| Humans Benefit from Nature | 47 | 39 | 11 | 2 |
| Must Balance Human Needs with Nature | 47 | 37 | 14 | 2 |

**(n=48)**

**City of Whitehorse**

| Environmental Orientation Category | % Strong Holders | % Moderate Holders | % Weak Holders | % Non Holders |
|---|---|---|---|---|
| Altruistic Orientation | 28 | 38 | 24 | 10 |
| Technocratic Orientation | 0 | 7 | 30 | 63 |
| Biospheric Orientation | 17 | 38 | 34 | 10 |
| Humans Benefit from Nature | 45 | 41 | 10 | 3 |
| Must Balance Human Needs with Nature | 38 | 55 | 3 | 3 |

**(n=14)**

**Yukon Territorial Government**

| Environmental Orientation Category | % Strong Holders | % Moderate Holders | % Weak Holders | % Non Holders |
|---|---|---|---|---|
| Altruistic Orientation | 19 | 44 | 6 | 31 |
| Technocratic Orientation | 0 | 6 | 13 | 81 |
| Biospheric Orientation | 19 | 44 | 6 | 31 |
| Humans Benefit from Nature | 50 | 38 | 12 | 0 |
| Must Balance Human Needs with Nature | 56 | 19 | 25 | 0 |

**(n=34)**

Table 3.2 is consistent with the greater research literature in that the sample population has a more pro-ecological, or altruistic, orientation than a technocratic

world-view. It also demonstrates that respondents generally hold biospheric beliefs, believe that humans benefit from nature, and that society must balance its needs with those of the natural world.

A new ecological paradigm is easily observed in scientific disciplines and academia, and has become more salient among the general public (Dunlap, 2008:14). However, many subscribers to the formerly established paradigms are resistant to changing their beliefs despite evidence that these beliefs may be inappropriate. This is especially true in the United States, where most studies examining environmental orientation take place, possibly due to an American conservative counter-movement, beginning in the Regan era of the 1980s, spearheaded by conservative economic and political elites (Dunlap, 2008:14-15). A societal shift is under way, however, leading people toward a more pro-environmental orientation in both the United States and internationally. Consistent with results from international studies, our sample of Canadian respondents differed from their American counterparts in the degree to which they hold technocratic beliefs. Seventy-seven percent of Olsen et al.'s (1993:47) respondents drawn from an American sample held some degree of technocratic beliefs. Our sample differed markedly in this regard, with only 30% of respondents holding some degree of technocratic beliefs. This difference may be due to either socio-geographic differences in beliefs, or that the general public has, over the 15 years separating these two studies, developed a more ecologically oriented set of environmental beliefs and values. Such a shift may also be in response to new information regarding the state of the environment,

following the value-belief-norm and norm-activation theories discussed in Chapter 1.

This study has found slight differences in the environmental orientations of City and YTG employees. There is some evidence for inter-institutional differences in environmental world-view norms. Our data suggest that this is due to both selective hiring and to social forces present within the institutions that influence novice employees to adopt some of the beliefs of their superiors.

***Differences in environmental orientations of City and YTG employees***

Although similar in their beliefs, employees of the City and YTG differ in the extent to which they hold certain beliefs. For illustrative purposes, we gave each institution an overall environmental orientation score for each category following Olsen et al. (1993), as discussed in Chapter two. These results are displayed in Figure 3.1.

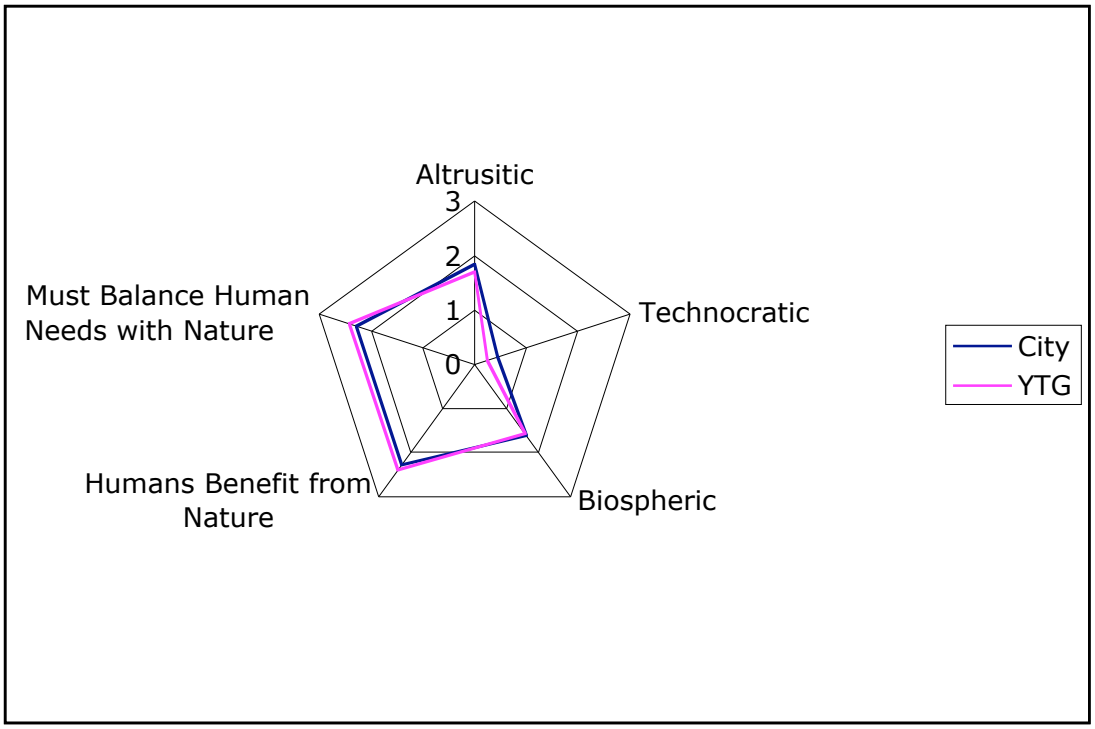


**Figure 3.1 Environmental Orientation Scores for City and YTG**

Figure 3.1 demonstrates that while each institution holds very similar environmental beliefs for four of the five environmental orientations, the two differ most in the degree to which they hold technocratic beliefs. Eighty-one percent of YTG employees reject technocratic beliefs. In contrast, technocratic beliefs are only rejected by 63 percent of City employees.

The presence of a technocratic view among half of City employees in our sample may have implications for policy. Holders of technocratic beliefs often advocate that a "business as usual" approach can be maintained under changing environmental conditions since they often believe that technological innovations can make up for ecological deficits (Olsen et al. 1991). As discussed in the beginning of this Chapter, technocratic beliefs can affect the way an institution plans to address climate impacts. If there are technocratic institutional cultural

norms within the City, planners might be inclined to wait until climate changes appear and use technological solutions to adapt, or mitigate, environmental impacts. In contrast, technocratic beliefs are rejected by a wide majority (81%) of YTG employees. These non-technocratic institutional cultural norms within the YTG may shape the way they address potential future climate impacts by planning to institute non-technological preventative solutions in advance.

The following section will examine differences between novice and veteran employees of both the City and YTG to assess whether or not the environmental orientations of each institution is a result of institutional cultural norms. If differences in the degree to which members of each institution hold technocratic beliefs are significant it would suggest that each institution might take different policy directions when deciding how to address future climate change impacts. Since the City receives its ICSP funding from the YTG and approximately 80% of the Yukon population lives under City jurisdiction, differences in policy direction could create conflict that reduces the adaptive capacity of the region.

***Institutional differences in environmental orientation***

In this section, our analysis is focused on identifying significant inter-institutional differences in environmental orientation. We begin by surveying the distribution of environmental orientation scores across eight categories of respondents (veteran and novice employees of both the City and YTG [novice = with present employer for 5 years or less, veteran = more than 5 years] veteran and novice employees overall, and all City and YTG employees). By examining the

categorical distribution of these scores we are able to identify any major differences between novice and veteran employees.

Once we had assembled our data and converted responses to index scores for each of the environmental orientation categories (Table 3.2 and 3.3) we began our statistical analysis. We constructed a contingency matrix using Microsoft Excel to determine the relationship between the index scores for each environmental orientation category and each category of participant. A contingency matrix assesses the probability that differences among groups could have plausibly occurred by chance. Values for each cell of the six-by-six matrix were constructed using the following equation where the estimated expected value for row *i,* column *j* is, $E_{ij} = n\pi_{ij} = n\frac{(n_{i.})}{n}\frac{(n_{.j})}{n} = \frac{(n_{i.})(n_{.j})}{n}$ and the test of independence is, $x^2 = \sum_{i,j}(n_{ij} - E_{ij})^2 / E_{ij}$. The first equation allowed us to construct hypothetical matrices showing the expected distribution of responses for the null hypothesis that there is no difference in response patterns among different categories of respondents (veteran or novice employees of the City or YTG). The above calculation was based on the number of actual responses we received.

We repeated this process five times, once for each environmental orientation category. The second equation is a test of independence. This equation allows us to evaluate our null and alternative hypotheses which are:

$H_o$: Responses are independent of institutional affiliation,

and,

$H_a$: Responses depend on institutional affiliation.

The statistical significance of our findings from our test of independence was tested using the Chi Square test. If significant differences are observed between the index scores of different categories of respondents this means that something is likely influencing these groups to differ from one another. The analysis discussed below is aimed at uncovering those influences.

There was weak statistical power for some of the comparisons used in analysis. Although the sample collected in this study represents a sufficient proportion of the population under examination to give our results validity, the small sample sizes make finding significant differences difficult. This limits the certainty with which we can discuss our findings. Table 3.3 demonstrates the statistical power obtained by the sample for comparisons between each category of respondent assuming a significant difference of one standard deviation. Statistical tests involving the entire sample (City versus YTG, and, veteran versus novice employees), all had sufficient statistical power.

**Table 3.3**

**Post Hoc Power Analysis**

| | **WH <5** | **WH >5** | **YTG <5** | **YTG >5** |
|---|---|---|---|---|
| **WH <5** | x | n=30 | n=18 | n=22 |
| **WH >5** | 0.54 | x | n=24 | n=28 |
| **YTG <5** | 0.32 | 0.37 | x | n=17 |
| **YTG >5** | 0.43 | 0.5 | 0.3 | x |

Table 3.3 demonstrates that, given our sample size, it is unlikely that we would find significant differences in the responses from various groups of respondents. The lower half of the matrix in Table 3.3 displays the probability that statistical analysis will find the difference between the two groups significant. For example,

the first column shows that there is a 54% chance that a statistical test would be able to identify significant differences between veteran and novice Whitehorse employees should a significant difference exist, a 32% chance of identifying a significant difference between novice employees from each organization, and a 43% chance of finding significance when comparing responses among novice City and veteran YTG employees. Given the low power for most of the comparisons in this study we selected alpha of .05 as significant for our comparisons of inter- and intra-institutional differences in environmental beliefs. Significant alpha levels are arbitrary and typically set between .01 and .05.

In the previous section, Figure 3.1 demonstrated that respondents from both the City and YTG had very similar environmental orientations on each dimension except technocratic beliefs, where City respondents were more technocratic than participants from the YTG. This is especially true for veterans. Table 3.4.1 highlights this trend.

**Table 3.4.1**
**Distribution of Environmental Orientation Across Institutions and Between Novice and Veteran Employees: Technocratic Orientation[2]**

| | wh<5 | wh >5 | ytg <5 | ytg >5 | all <5 | all >5 | allWH | allYTG |
|---|---|---|---|---|---|---|---|---|
| % strong | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| % moderate | 0.08 | 0.06 | 0.00 | 0.10 | 0.06 | 0.07 | 0.07 | 0.06 |
| % weak | 0.17 | 0.39 | 0.33 | 0.00 | 0.22 | 0.25 | 0.30 | 0.13 |
| non holders | 0.75 | 0.56 | 0.67 | 0.90 | 0.72 | 0.68 | 0.63 | 0.81 |

**(n=46)**

[2] Legend: **wh** = employee of the City of Whitehorse, **ytg** = employee of the Yukon Territorial Government, **<5** = less than five years of employment with that organization, **>5** = five years or more of employment with that organization, **allWH, allYTG** = all respondents in that category.

Table 3.4.1, technocratic orientation, reveals a difference between institutions in the degree to which their members subscribe to a technocratic paradigm. Veteran employees of the YTG overwhelmingly reject (90%) a technocratic world-view. In contrast, nearly half (45%) of veteran Whitehorse employees subscribe to a technocratic paradigm. The majority of novice employees within each organization tend to reject a technocratic world-view (75% and 67% for Whitehorse and YTG employees, respectively). These broad differences suggest that there may be institutional cultural norms promoting technocratic beliefs among City employees and non-technocratic beliefs among YTG employees. However, as shown in Table 3.4.2, we found no significant differences between the degree of technocratic views held by our respondents. It is important to note that the difference between veteran City and YTG employees approached significance. This is particularly notable given that, with a power of 0.5 for this category, there is only a 50% chance that our analysis would detect a significant difference, should it exist.

**Table 3.4.2**
**Alpha and Chi Square Values for Technocratic Orientation**

| | **alpha** | **chi square** |
|---|---|---|
| wh <5 / wh >5 | 0.42 | 1.70 |
| wh <5 / ytg <5 | 0.59 | 1.04 |
| wh <5 / ytg >5 | 0.40 | 1.83 |
| wh >5 / ytg <5 | 0.79 | 0.47 |
| wh >5 / ytg >5 | 0.08 | 5.19 |
| ytg <5 / ytg >5 | 0.12 | 4.18 |
| all <5 / all >5 | 0.95 | 0.11 |
| WH / YTG | 0.40 | 1.82 |

Although we did not detect a significant difference between the technocratic beliefs of City and YTG employees, we found evidence that suggests such a

difference may exist. Table 3.5.1 shows that respondents overwhelmingly agree that the needs of humans must be balanced with those of the natural environment.

**Table 3.5.1**
**Distribution of Environmental Orientation Across Institutions and Between Novice and Veteran Employees**: **Must Balance Human Needs with Nature**[3]

| | wh<5 | wh >5 | ytg <5 | ytg >5 | all <5 | all >5 | allWH | allYTG |
|---|---|---|---|---|---|---|---|---|
| % strong | 0.50 | 0.29 | 0.67 | 0.50 | 0.56 | 0.37 | 0.38 | 0.56 |
| % moderate | 0.42 | 0.65 | 0.17 | 0.20 | 0.33 | 0.48 | 0.55 | 0.19 |
| % weak | 0.00 | 0.06 | 0.17 | 0.30 | 0.06 | 0.15 | 0.03 | 0.25 |
| non holders | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.03 | 0.00 |

**(n=45)**

The majority of novice employees believe strongly in the need for balance (50% and 67% of novice respondents from Whitehorse and YTG, respectively). One important inter-institutional difference in responses is that, while half (50%) of the veteran employees of YTG subscribe strongly to this belief, only 29% of veteran Whitehorse staff share the same opinion. The majority of all YTG employees believe strongly in the need for balance (55%) while the majority (56%) of Whitehorse staff holds a moderate belief. This finding is not surprising, given that Whitehorse staff tends to be more technocratic than YTG staff, and are more confident in the ability of technology to solve environmental problems.

Table 3.5.2 demonstrates that these differences in the degree to which City and YTG employees believe humans must balance their needs with those of the

[3] Legend: **wh** = employee of the City of Whitehorse, **ytg** = employee of the Yukon Territorial Government, **<5** = less than five years of employment with that organization, **>5** = five years or more of employment with that organization, **allWH, allYTG** = all respondents in that category.

natural world are significant. This difference was also significant between the two organizations overall.

**Table 3.5.2**
**Alpha and Chi Square Values for Must Balance Human Needs with Nature**

| | alpha | chi square |
|---|---|---|
| wh <5 / wh >5 | 0.31 | 3.59 |
| wh <5 / ytg <5 | 0.32 | 3.45 |
| wh <5 / ytg >5 | 0.15 | 5.24 |
| wh >5 / ytg <5 | 0.12 | 4.13 |
| wh >5 / ytg >5 | **0.05*** | **5.81*** |
| ytg <5 / ytg >5 | 0.78 | 0.47 |
| all <5 / all >5 | 0.52 | 2.26 |
| WH / YTG | **0.03**** | **8.88**** |

*** = alpha ≤ 0.5, ** = alpha < 0.01**

Again, this difference is not surprising given the marked difference in the level of technocratic beliefs between organizations (44% versus 10% for holders of technocratic beliefs for veteran City and YTG employees, respectively, and 37% versus 19% overall). This finding presents strong support to the claim made in the previous section that the technocratic beliefs of veteran employees may influence their policy choices. There is evidence that veteran City employees are both more technocratic and less accepting of the belief that humans must balance their needs with those of nature than their peers in the YTG. These findings present evidence supporting the notion that veteran City employees are both more likely to accept technological solutions and to reject non-technological solutions than are their junior peers and colleagues in the YTG.

Employees of the City and YTG held similar beliefs for the remaining environmental orientation categories. An examination of Table 3.6.1, altruistic orientation, reveals little differences in the distribution of index scores.

**Table 3.6.1**
**Distribution of Environmental Orientation Across Institutions and Between Novice and Veteran Employees: Altruistic Orientation[3]**

| | wh<5 | wh >5 | ytg <5 | ytg >5 | all <5 | all >5 | allWH | allYTG |
|---|---|---|---|---|---|---|---|---|
| % strong | 0.25 | 0.12 | 0.17 | 0.20 | 0.22 | 0.15 | 0.17 | 0.19 |
| % moderate | 0.33 | 0.41 | 0.50 | 0.40 | 0.39 | 0.41 | 0.38 | 0.44 |
| % weak | 0.33 | 0.35 | 0.17 | 0.00 | 0.28 | 0.22 | 0.34 | 0.06 |
| non holders | 0.08 | 0.12 | 0.17 | 0.40 | 0.11 | 0.07 | 0.10 | 0.31 |

**(n=46)**

Not surprisingly, differences in altruistic orientation were not significant, as shown by Table 3.6.2.

**Table 3.6.2**
**Alpha and Chi Square Values for Altruistic Orientation**

| | **alpha** | **chi square** |
|---|---|---|
| wh <5 / wh >5 | 0.82 | 0.91 |
| wh <5 / ytg <5 | 0.78 | 1.06 |
| wh <5 / ytg >5 | 0.11 | 5.87 |
| wh >5 / ytg <5 | 0.86 | 0.74 |
| wh >5 / ytg >5 | 0.25 | 4.11 |
| ytg <5 / ytg >5 | 0.67 | 1.56 |
| all <5 / all >5 | 0.94 | 0.37 |
| WH / YTG | 0.11 | 6.0 |

There is generally very little difference in biospheric orientation between the two governance organizations, as shown by Table 3.7.1.

[3] Legend: **wh** = employee of the City of Whitehorse, **ytg** = employee of the Yukon Territorial Government, **<5** = less than five years of employment with that organization, **>5** = five years or more of employment with that organization, **allWH, allYTG** = all respondents in that category.

**Table 3.7.1**
**Distribution of Environmental Orientation Across Institutions and Between Novice and Veteran Employees**: **Biospheric Orientation**[4]

| | wh<5 | wh >5 | ytg <5 | ytg >5 | all <5 | all >5 | allWH | allYTG |
|---|---|---|---|---|---|---|---|---|
| % strong | 0.33 | 0.24 | 0.17 | 0.20 | 0.28 | 0.22 | 0.28 | 0.19 |
| % moderate | 0.25 | 0.47 | 0.33 | 0.60 | 0.28 | 0.52 | 0.38 | 0.50 |
| % weak | 0.25 | 0.24 | 0.33 | 0.00 | 0.28 | 0.15 | 0.24 | 0.13 |
| non holders | 0.17 | 0.06 | 0.17 | 0.20 | 0.17 | 0.07 | 0.10 | 0.19 |

**(n=45)**

Employees of Whitehorse and YTG overwhelmingly accept biospheric beliefs (90% and 81%, respectively), as a large proportion subscribes either moderately or strongly to these beliefs (66% and 69%, for Whitehorse and YTG, respectively). We defined biospheric beliefs as those centered on the notion that humans are a part of the natural world. These beliefs not only hold that the environment has intrinsic worth, but that our interests are encapsulated with those of nature since our quality of life depends on the integrity of the natural world. The finding reported in Table 3.7.1 suggests that, although slightly less than half of the veteran City employees hold technocratic beliefs, they do not do so because of a callous attitude toward nature. Rather, it is possible that they believe that technology will not only serve to improve the human condition, but can benefit, or at least have a negligible effect on, the environment as well. As in the case for altruistic beliefs, we found no significant difference among City and YTG employees for biospheric beliefs, as show in Table 3.7.2.

[4] Legend: **wh** = employee of the City of Whitehorse, **ytg** = employee of the Yukon Territorial Government, **<5** = less than five years of employment with that organization, **>5** = five years or more of employment with that organization, **allWH, allYTG** = all respondents in that category.

**Table 3.7.2**
**Alpha and Chi Square Values for Biospheric Orientation**

| | alpha | chi square |
|---|---|---|
| wh <5 / wh >5 | 0.58 | 1.94 |
| wh <5 / ytg <5 | 0.89 | 0.60 |
| wh <5 / ytg >5 | 0.21 | 4.52 |
| wh >5 / ytg <5 | 0.79 | 1.04 |
| wh >5 / ytg >5 | 0.29 | 3.72 |
| ytg <5 / ytg >5 | 0.27 | 3.91 |
| all <5 / all >5 | 0.34 | 3.32 |
| WH / YTG | 0.57 | 1.93 |

An examination of Table 3.8.1 shows that members of each organization believe overwhelmingly that humans benefit from nature (97% and 100% for the City of Whitehorse and YTG, respectively).

**Table 3.8.1**
**Distribution of Environmental Orientation Across Institutions and Between Novice and Veteran Employees**: **Human Benefit from Nature**[5]

| | wh<5 | wh >5 | ytg <5 | ytg >5 | all <5 | all >5 | allWH | allYTG |
|---|---|---|---|---|---|---|---|---|
| % strong | 0.58 | 0.35 | 0.67 | 0.40 | 0.61 | 0.37 | 0.45 | 0.50 |
| % moderate | 0.25 | 0.53 | 0.17 | 0.50 | 0.22 | 0.52 | 0.41 | 0.38 |
| % weak | 0.08 | 0.12 | 0.17 | 0.10 | 0.11 | 0.11 | 0.10 | 0.13 |
| non holders | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.07 | 0.03 | 0.00 |

**(n=45)**

Although the degree to which respondents subscribe to this view is evenly distributed between organizations, there is a difference between veteran and novice staff with 61% of novice employees believing strongly in the benefits of nature compared to only 37% for veterans. Fifty-percent or more of novice

[5] Legend: **wh** = employee of the City of Whitehorse, **ytg** = employee of the Yukon Territorial Government, **<5** = less than five years of employment with that organization, **>5** = five years or more of employment with that organization, **allWH, allYTG** = all respondents in that category.

employees from both the City and YTG, and veteran YTG employees, hold this belief strongly, whereas this is the case for only 35% of veteran City employees. This is not surprising, given that more than half of the veteran City employees hold technocratic beliefs and one might expect those with great faith in technology to believe less in the benefits humans derive from nature. Veteran City employees do not believe that humans benefit from nature as much as their colleagues do. Again, no significant differences were found between the City and YTG for this dimension, as shown in Table 3.8.2

**Table 3.8.2**
**Alpha and Chi Square Values for Human Benefit from Nature**

| | alpha | chi square |
|---|---|---|
| wh <5 / wh >5 | 0.30 | 3.66 |
| wh <5 / ytg <5 | 0.82 | 0.92 |
| wh <5 / ytg >5 | 0.54 | 2.15 |
| wh >5 / ytg <5 | 0.29 | 2.43 |
| wh >5 / ytg >5 | 0.22 | 4.37 |
| ytg <5 / ytg >5 | 0.41 | 1.78 |
| all <5 / all >5 | 0.28 | 3.77 |
| WH / YTG | 0.87 | 0.69 |

The findings discussed so far suggest that veteran City employees value nature (they hold altruistic beliefs) and believe that humans benefit from nature (although not as much as their junior colleagues do), but 45% believe that technological solutions are sufficient to address problems for both humans and ecosystems. This claim is supported by the finding that veteran City employees hold weaker beliefs in the need to balance human needs with those of nature. It is thus not surprising that the majority of projects selected by the City for ICSP funding involve the development of infrastructure. Indeed, technocratic views in

Whitehorse may have lead to the decision to use ICSP funding primarily for infrastructure projects. In contrast, YTG respondents, especially veteran employees, overwhelmingly reject technocratic beliefs. This suggests that they will likely consider non-technological interventions to adapt or mitigate potential future climate threats. This difference highlights the contribution of a variety of perspectives on adaptive capacity. A technocratic perspective may fail to consider important non-technological solutions, while a non-technocratic perspective may not give enough consideration to potentially beneficial technological solutions. If each perspective is considered a more broad range of potentially adaptive solutions may be considered.

Before we are able to proceed with our analysis of the institutional influence on environmental beliefs and draw any firm conclusions from these data we must first establish that the responses we received are not confounded by any demographic variables. By controlling for demographic differences among respondents we can determine whether or not it is appropriate to attribute differences in responses to institutional affiliation. The next section is aimed at uncovering any potential demographic bias in our study.

***The influence of demographic variables on environmental beliefs***

The research literature previously discussed examined the potential influence of certain demographic variables on environmental beliefs. To control for these variables, we conducted a multiple regression analysis comparing each environmental orientation category with each potential confounding demographic

variable. If there was no correlation between demographic variables and environmental orientation categories, we can be confident that any observed differences among categories of respondents are due to the effect of other variables. If there is a correlation between a demographic variable and an environmental orientation category but there are no significant differences among groups of respondents, then we can similarly conclude that demographic variables are not affecting our results. However, if there is a significant correlation between a demographic variable and an environmental orientation category, and there is a significant difference among categories of respondents regarding this variable, it is likely that this demographic difference between samples is influencing our results. The results of this analysis are presented for each environmental orientation category in Tables 3.9 through 3.13.

**Table 3.9: Multiple Regression Analysis for Altruistic Beliefs and Demographic Variables**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.430 | 3.409 | | .420 | .678 |
| | Yrs.employed | .034 | .070 | .118 | .479 | .636 |
| | Employment with another org. | -.060 | .062 | -.256 | -.957 | .347 |
| | Gender | -.368 | .907 | -.081 | -.405 | .688 |
| | Education | -.431 | .703 | -.129 | -.613 | .545 |
| | Age | .048 | .048 | .238 | 1.014 | .319 |
| | Annual income | .717 | .344 | .409 | 2.088 | **.046*** |

a. Dependent Variable: reply

* = sig. p<0.05

Table 3.9 shows that annual income correlates significantly and positively with altruism. This finding is not a confounding variable since there is no significant income difference between City and YTG employees, either overall (p=0.13), for veteran employees (p=0.49), or for novice employees (p=0.07). Although the comparison between novice employees approaches significance, this finding does not affect our interpretation of results since there are no significant differences between the altruistic beliefs of novice employees across institutions (*a*=.787), as shown in Table 3.6.1.

**Table 3.10: Multiple Regression Analysis for Technocratic Beliefs and Demographic Variables**

**Coefficients**[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 5.492 | 2.714 | | 2.023 | .053 |
| | Income | -.576 | .274 | -.436 | -2.106 | **.044*** |
| | Yrs. employed | .099 | .056 | .461 | 1.770 | .088 |
| | Employment with another org | .115 | .050 | .655 | 2.319 | **.028*** |
| | Gender | .702 | .722 | .206 | .972 | .339 |
| | Education | .975 | .560 | .388 | 1.741 | .093 |
| | Age | -.039 | .038 | -.258 | -1.040 | .307 |

a. Dependent Variable: reply

* = sig. p<0.05

Table 3.10 shows the results of a regression analysis using the technocratic index scores of participants as the dependent variable. The results show that technocratic beliefs are significantly and negatively correlated with income and significantly and positively correlated with the number of years one

has been employed by another organization before starting work for their present employer. We compared the demographic characteristics of City and YTG employees on these dimensions and found no significant difference between the two groups. The income of respondents from the two institutions does not differ overall ($p=0.13$), for veteran ($p=0.49$), or novice ($p=0.07$) employees. There is no significant difference between veteran and novice YTG employees ($p=0.64$). However, there is a significant difference in income between veteran and novice City employees ($p=0.03$). Interestingly, this finding does not confound, but rather supports, our claim that the technocratic beliefs among veteran City employees are the result of an institutional culture of technocracy. Novice City employees earn significantly *less* than veteran City employees. Given the negative relationship found between technocratic beliefs and income, we would expect novice City employees to be *more* technocratic than their peers. The opposite is true. Given that we observed no other demographic correlates with technocratic beliefs, this finding suggests that some social force may be influencing veteran employees to be more technocratic than their junior peers. It is possible that there are pressures being exerted on employees to conform to institutional norms of technocratic beliefs. If this is the case it is possible that, over time, novice Whitehorse employees will become more accepting of technocratic beliefs. If this shift takes place, the City may wait until climate impacts are observed and then take action to address their effects with technological solutions. This finding also suggests that the City may become less inclined to implement non-technological adaptation initiatives as a preventative measure, such as land-use planning for future environmental change.

The number of years spent working for another organization also did not differ significantly overall (p=0.85), for veteran (p=0.86) or novice (p=0.80) employees, nor for novice versus veteran YTG (p=0.23) or City (p=0.23) employees.

In this case, demographic differences between the City and the YTG cannot explain differences in technocratic beliefs. Demographic factors did not confound our results. This result provides further support for the idea that the above average level of technocratic beliefs of veteran City employees, and below average level of technocratic beliefs of veteran YTG employees may be the result of institutional cultural norms, as we have now ruled out the potential demographic influences discussed in the greater research literature.

**Table 3.11: Multiple Regression Analysis for Biospheric Beliefs and Demographic Variables**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.206 | 5.646 | | .214 | .832 |
| | Yrs. employed | .160 | .117 | .359 | 1.372 | .181 |
| | Employment with another org | .192 | .103 | .525 | 1.850 | .075 |
| | Gender | 1.829 | 1.503 | .259 | 1.217 | .234 |
| | Education | .615 | 1.165 | .118 | .528 | .602 |
| | Age | -.060 | .079 | -.190 | -.765 | .450 |
| | Annual income | .161 | .569 | .059 | .283 | .779 |

a. Dependent Variable: reply

Table 3.11 shows no correlations between any of the demographic variables collected, and biospheric beliefs. This result is not surprising given the strong biospheric orientation found among all groups (Table 3.7.1). This result demonstrates that our results for this dimension were not confounded by demographic differences among study participants.

**Table 3.12: Multiple Regression Analysis for Humans Benefit from Nature and Demographic Variables**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 4.661 | 3.782 | | 1.232 | .228 |
| | Yrs. employed | .046 | .078 | .140 | .588 | .561 |
| | Employment with another org | -.008 | .069 | -.031 | -.122 | .904 |
| | Gender | 1.017 | 1.007 | .196 | 1.010 | .321 |
| | Education | .622 | .780 | .162 | .798 | .432 |
| | Age | -.094 | .053 | -.401 | -1.771 | .087 |
| | Annual income | .419 | .381 | .208 | 1.099 | .281 |

a. Dependent Variable: reply

As in Table 3.11, Table 3.12 found no significant correlations between any of the demographic variables and the environmental orientation category “humans benefit from nature.” This result demonstrates that the results presented above describing this dimension were not confounded by demographic differences. It is interesting to note that the only dimension that approached significance was that of age. Age was negatively, yet not significantly, correlated with the belief that humans benefit from nature.

**Table 3.13: Multiple Regression Analysis for Must Balance Human Needs with Nature and Demographic Variables**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .186 | 3.969 | | .047 | .963 |
| | Yrs. employed | .068 | .082 | .205 | .832 | .412 |
| | Employment with another org | .110 | .073 | .403 | 1.508 | .143 |
| | Gender | 2.705 | 1.057 | .514 | 2.561 | **.016*** |
| | Education | .710 | .819 | .183 | .867 | .393 |
| | Age | -.059 | .056 | -.250 | -1.069 | .294 |
| | Income | .063 | .400 | .031 | .158 | .875 |

a. Dependent Variable: reply

*= sig. p<0.05

Table 3.13 shows that gender is correlated with the belief that society must balance human needs with those of nature. In our study women were quite significantly more accepting of this belief than men (p=0.016), scoring on average 29% higher than men on our index. As discussed in Chapter 2, there is presently no agreement regarding the role of gender in environmental orientation. In the context of value-belief-norm and norm-activation theory discussed in Chapters 1 and 2, our results suggest that women may be more willing than men to make behavioural changes to benefit the environment. However, there is no significant difference between the number of women and men employed by either institution (p=0.71), nor between veteran or novice employees across (p=0.45 for YTG, p=0.09 for City) or between (p=0.61 for novice, p=0.93 for veteran) institutions.

Our results for this section were not confounded by demographic differences. Reflecting on the data for each environmental orientation category, there is some evidence to show that the institutions under study are behaving in ways that the theories presented in the literature review would suggest. Given the number of statistical tests we conducted it is possible that some would reveal a significant difference by chance, we believe this is not the case for technocratic beliefs. This is because of the diversity of evidence on several dimensions suggesting the possibility of differences in institutional acceptance of technocratic beliefs. As the greater literature would lead us to expect, we found income to be negatively correlated with technocratic beliefs. Somewhat surprisingly, given the larger literature indicating little agreement regarding the role of gender in environmental beliefs, and that differences, when observed, are often slight, we also found that women believe significantly more strongly in the need to balance human needs with nature than do men.

The next section examines the social forces responsible for reproducing institutional norms in environmental orientation among participants. Established institutional norms are reflected in the day-to-day business of an organization (DiMaggio and Powell, 1983). If there are no institutional norms regarding technocratic beliefs, the degree to which the City pursues technocratic policy, and the degree to which the YTG pursues non-technocratic policy, will depend on the influence of the individuals holding those beliefs. If institutional norms are found for technocratic environmental beliefs it is likely that these beliefs will influence the policy choices of the City and YTG.

### 3.4 Social forces influencing beliefs within institutions

As discussed in Chapter 1, social forces within institutions can cause their members to come to resemble one another over time. This can reduce adaptive capacity by decreasing the diversity of perspectives in discussions on adaptation projects. Institutions develop a set of norms that serve as a behaviour guiding structure. These norms mould the preferences of social actors and if they apply to environmental beliefs they can help shape institutional approaches to environmental decision-making.

The discussion of our results has thus far has suggested that there is some evidence that social forces are at work within our sample: (1) there are institutional differences in the degree of acceptance of technocratic beliefs and in the belief that humans benefit from nature; and, (2) these differences are independent of the influence of demographic variables. This section will explore whether or not social forces are influencing environmental orientation, and if so, the extent to which they are a result of on-the-job socialization or selective hiring.

We tested the possible effect of on-the-job socialization and selective hiring using our environmental orientation categories. We compared the differences in environmental orientation index scores of veteran versus novice employees. If on-the-job socialization is affecting the beliefs of participants we expect to see not only a difference in the beliefs of veteran versus novice employees, but also less variation in beliefs among veterans than novices. If there is evidence for on-the-job socialization, it is possible that novice employees will come to resemble

their more senior peers over time. If there is no evidence for on-the-job socialization at their present job, institutional forces can influence the beliefs of new employees they bring into their organization through selective hiring. In this case differences in beliefs are likely a result of professionalization or the social pressures exerted on participants when previously employed by other organizations. Institutional norms affect selective hiring by influencing hiring committees to select employees with similar backgrounds as those already employed by the organization.

By dividing responses into environmental orientation categories, we were able to determine which types of belief are most influenced by institutional cultural norms. To test if institutional pressures were influencing the responses of participants we conducted F-tests comparing the differences in the mean index scores of four groups of respondents (veteran and novice; City and YTG employees) for each environmental orientation category. An F-test calculates the two-tailed probability that the variances within two samples are not significantly different. If the variance for veteran employees is significantly less than the variance for novice employees this suggests that there are institutional forces at work within the institutions causing the beliefs of veteran employees to resemble one another over time. The results of this analysis are presented in Tables 3.14 through 3.18.

Table 3.14 focuses on technocratic orientation and shows one significant F-value for the category “City veteran versus YTG veteran” (p=0.03).

**Table 3.14: F-Test Results for Technocratic Orientation**

| | City novice | YTG novice | City veteran | YTG veteran |
|---|---|---|---|---|
| **City novice** | x | | | |
| **YTG novice** | 0.94 | x | | |
| **City veteran** | 0.31 | 0.38 | x | |
| **YTG veteran** | 0.25 | 0.36 | **0.03*** | x |

* = sig. p<0.05

This result is expected, given that 46% of veteran City employees were found to be much more technocratic than all other categories of respondent, and that 90% of veteran YTG employees rejected technocratic beliefs. Table 3.14 shows that veteran City employees have significantly more variance in their technocratic beliefs than veteran YTG employees.

Our results suggest that there may be social pressures to adopt non-technocratic beliefs among YTG employees. Table 3.10 shows a significant (p=.028) and positive correlation between the number of years employed by another organization and technocratic beliefs. As shown in Table 3.1, YTG employees have spent more time employed by another organization than City employees and one would thus expect them to have more technocratic beliefs given the positive correlation we observed between time employed by another organization and technocratic beliefs. Indeed, novice YTG employees are slightly more technocratic than novice City employees (24% versus 33% for novice YTG and novice City employees, respectively). However, the percentage of veteran YTG employees with technocratic beliefs drops to 10% while the percentage of technocratic veteran City employees rises to 46%. Our F-test demonstrates that there is significantly less variance among the beliefs of veteran YTG employees than among veteran City employees. The greater homogeneity of beliefs among

veteran YTG employees suggests that social forces may be present within that institution influencing members to conform to institutional norms. Our data do not show a significant difference between the variance of veteran and novice YTG employees. This is likely due to the presence of a strong outlier among veteran YTG employees that could not be eliminated due to our low sample size.

Table 3.15 shows that there are no significant differences between the variances in altruistic beliefs among each group of respondent.

**Table 3.15: F-Test results for altruistic orientation**

| | City novice | YTG novice | City veteran | YTG veteran |
|---|---|---|---|---|
| **City novice** | x | | | |
| **YTG novice** | 0.75 | x | | |
| **City veteran** | 0.90 | 0.81 | x | |
| **YTG veteran** | 0.44 | 0.75 | 0.46 | x |

This would suggest that the social pressures being exerted on novice employees to adopt institutional norms do not include pressure to adopt a particular set of altruistic beliefs similar to those of their senior colleagues. There are three potential explanations why social pressures to conform were not supported by the F-test in this instance. One potential explanation is that altruistic beliefs and values are not often discussed in the YTG workplace and pressures to conform to an accepted set of altruistic beliefs are not present because this topic is not common in workplace discussions. Second, differences in altruistic beliefs may be a result of selective hiring. Last, altrusitic beliefs may be completeley independent of institutional affiliation or demographic variables and be influenced by another factor.

Table 3.16 shows that there are no significant differences in the variance of bioshperic beliefs among all study participants. This is not surprising given the uniformity of biospheric beliefs described earlier in this Chapter.

**Table 3.16: F-Test Results for Biospheric Orientation**

| | **City novice** | **YTG novice** | **City veteran** | **YTG veteran** |
|---|---|---|---|---|
| **City novice** | x | | | |
| **YTG novice** | 0.69 | x | | |
| **City veteran** | 0.72 | 0.46 | x | |
| **YTG veteran** | 0.92 | 0.63 | 0.81 | x |

None of the F-values in Table 3.17 approach significance. This is likely due to the overwhelming acceptance of a belief that humans benefit from nature articulated by our participants. This analysis found no evidence of institutional social pressures to conform to a set of beliefs for this dimension.

**Table 3.17: F-Test Results for Humans Benefit from Nature**

| | City novice | YTG novice | City veteran | YTG veteran |
|---|---|---|---|---|
| City novice | x | | | |
| YTG novice | 0.54 | x | | |
| City veteran | 0.83 | 0.63 | x | |
| YTG veteran | 0.26 | 0.72 | 0.29 | x |

We found no significant differences in the variance of the degree to which our groups of respondents accept the belief that we must balance human needs with those of nature (Table 3.18). This result is not surprising given that this belief is held almost universally, albeit to varying degrees, among participants.

**Table 3.18: F-Test Results for Must Balance Human Needs with Nature**

| | City novice | YTG novice | City veteran | YTG veteran |
|---|---|---|---|---|
| City novice | x | | | |
| YTG novice | 0.68 | x | | |
| City veteran | 0.52 | 0.94 | x | |
| YTG veteran | 0.49 | 0.85 | 0.88 | x |

Although there are many observed, and some significant, differences in the beliefs of our different categories of respondents, we found only one significant difference when comparing the variance of beliefs among groups of respondents. This general lack of variance suggests that there is a relatively similar diversity of environmental beliefs among participants in all but one category, that of technocratic beliefs. Our results suggest it is possible that there are social pressures being exerted on employees of the YTG to conform to a particular set of non-technocratic beliefs. We did not observe a significant difference between novice and veteran YTG employees; however, a significant difference would likely be found to exist if we had a larger sample.

Our review of the greater research literature found that social pressures to conform are apparent in highly salient dimensions of day-to-day business such as, for example, dress, the relationship of individuals to their superiors/subordinates, etc. Many of our environmental orientation categories may not be salient enough in the day-to-day operations of the City and YTG to warrant the development of strong workplace norms for those beliefs. A possible explanation for why we were able to find evidence of social pressures influencing technocratic or non-technocratic beliefs, and not the other environmental

orientation categories, is that technocratic beliefs may be the most salient of all the beliefs and values examined in a workplace context. For example, when deciding how to reduce environmental impact, governance institutions must often choose between technocratic (e.g. improving building energy efficiency, constructing a sewage treatment plant) and non-technocratic (urban planning for densification, using bio filters for sewage treatment) or behavioural (campaigns to get people to use public transit) projects. Institutions may thus develop a set of norms for how to address such problems and develop a corresponding normative set of beliefs. Environmental orientation categories where we found no evidence of institutional pressures to conform such as, for example, altruistic orientation, are not likely a part of the day-to-day operations of governance institutions. Thus, there is likely no standard procedure from which institutional behavioural or belief norms can develop. As a result, forces outside of the workplace likely influence the beliefs of employees on these dimensions.

Several authors within the institutional literature have reported that institutions attract candidates with similar backgrounds due to the isomorphic pressures of professionalization. Moreover, institutions further shape their attitudes once hired (DiMaggio and Powell, 1983; March and Olsen, 2005; Ashworth, 2009). Our results suggest selective hiring is shaping the distribution of environmental beliefs of employees of the City and YTG. A close examination of Tables 3.4.1, 3.5.1, 3.6.1, 3.7.1, and 3.8.1 reveal that in 16 out of a total of 20 comparisons of environmental orientation between the two organizations (strong, moderate, weak, non-holders [4 response categories] multiplied by five orientation

categories = 20 comparisons), the proportion of responses across institutions found among veteran employees is mirrored by the proportion of responses of novice employees for each organization. That is to say, for example, when a greater proportion of veteran YTG employees hold a strong belief for a particular environmental orientation category than do veteran City employees, a greater proportion novice YTG employees will hold a strong belief for that category than novice City employees. For example, as shown in Table 3.5.1, 50% of veteran YTG employees hold strong beliefs that humans must balance their needs with those of nature, while the same is true for only 29% of veteran City employees. Similarly, 67% of novice YTG employees hold strong beliefs in the same category, a greater proportion than novice City employees, with only 50% reporting strong belief. This suggests that each institution is either attracting candidates with beliefs more similar to their employees than to the employees of other organizations, or that institutional pressures are influencing novice employees to resemble veterans in their beliefs, or even that both processes are simultaneously at work.

Our results support the hypotheses outlined in the beginning of this Chapter. We found that our participant's environmental beliefs resemble those of members of their organization more than the beliefs of members of the other organization under examination. We also found evidence that beliefs regarding one's confidence in technology to address environmental problems are likely influenced by on-the-job socialization. We found no evidence that other beliefs are

influenced by such social processes, and may be selected for through selective hiring.

We found weak evidence suggesting the beliefs of veteran employees resemble one another more than novice employees. Our small sample size, especially for YTG respondents, and a strong outlier among veteran YTG respondents, resulted in us being unable to establish significant difference in the variance of beliefs between veterans and novices. However, our results suggest that with a larger sample these differences would be significant.

Socio-demographic variables had little influence on environmental beliefs, much less so than institutional affiliation, and did not influence our results.

Our results suggest that social pressures may influence social actors to conform to institutional cultural norms regarding environmental beliefs. It is important to point out that institutional norms affected our respondent's *personal* beliefs, suggesting that these institutional norms play a role in shaping perception. By helping to shape the way members of an institution conceptualize the human relationship with the environment it is possible that institutional norms influence individual's ideas of how humans should interact with the environment to produce a particular outcome. Differences in institutional norms can potentially lead different institutions to pursue different environmental policy directions and have implications for climate change adaptation.

In the next Chapter we will examine how participants conceptualize sustainability, a concept focused on the human-environment interface. We will then examine how members of each institution perceive the Whitehorse ICSP to determine if there is a relationship between institutional norms, environmental beliefs, perceptions of sustainability, and perceptions of how environmental policy can achieve these aims.

## Chapter 4: Perspectives on Sustainability, Perception of the Whitehorse ICSP, and Barriers to Climate Change Adaptation in Whitehorse

### 4.1 Introduction

This chapter presents the results of our qualitative analysis of respondent's perceptions of sustainability and the Whitehorse ICSP, and discusses how these may affect the adaptive capacity of Whitehorse. We begin with a discussion of how sustainability is perceived within each institution and relate these findings to the results of our quantitative analysis. We then examine of how sustainability is perceived within each institution. Following this discussion we examine how participants view the Whitehorse ICSP and explore ways in which definitions of sustainability may influence these views. Last, we discuss potential barriers to the implementation of the Whitehorse ICSP, how these may affect adaptation to environmental change, and the implications of this study for our understanding of the sustainability concept in an applied policy context.

### 4.2 Institutional and Individual Perspectives of Sustainability and the Whitehorse ICSP

This section presents the results of our analysis of the data collected in part 2 of the mail-in survey and our interviews. It begins with a discussion of respondent's personal definitions of sustainability, whether or not they perceive a culture of sustainability both within their workplace and Whitehorse in general, and if they believe sustainability is possible in Whitehorse. Following this discussion we present qualitative data examining respondent's perspectives on the ICSP in general, their perceptions of its strengths and weaknesses, and whether or not they believe it to be a realistic, useful, or needed plan.

We focused on sustainability in this study because it is the theme within which our respondents discussed adaptation-related issues including planning for the future, human impact on the environment, and environmental impact on humans. The City policy designed to help Whitehorse prepare for and respond to these future challenges, the ICSP, is also framed in the context of sustainability.

### *Perceptions of sustainability*

Our interviews revealed that employees of the City of Whitehorse often encounter topics related to or framed in the context of sustainability. One respondent articulated the view that;

> I guess everything that we see and do you're always thinking the sustainability word… So now that you're on the sustainability bandwagon you look at it a different way. (Interview #1: City employee)

For some employees the view expressed above means they are now more considerate of the impact of their decisions on the environment or future generations. One respondent explains how sustainability influences their decisions;

> Sustainability is operating in a more responsible, less wasteful manner. (Survey response #16: City employee)

However, for some, sustainability is just a new way of framing business as usual;

> I think it's a balance. If you're going to talk about a sustainable organization, it's one that doesn't overextend itself [fiscally]. (Interview #3: City employee)

> [Referring to the ICSP] These are all sustainable principles that we've practiced for years. I guess one way to look at it is that by

> developing and adopting a plan it formalizes our corporate mentality and corporate objective towards sustainability and growing within our means. We've had it embedded into other policies and in those respects I think it's very good. (Interview #8: City employee)

The Whitehorse ICSP (Cabott, 2007) stressed that the creation of the ICSP was a collaborative process, integrating a broad range of perspectives from City employees and the general public. This idea is supported by many of our interviewees. For example;

> What they did was as far as I can understand it, they had a charette, they had local people as well as the public, maybe not as many public participants as you want, many people are critical of the fact that when you do these charettes you get a lot of experts that come in. The City, we have a strategic planning session every time we have a new Council and as we go though the years we have a meeting every year to look at this plan. Our administration sat down and said "how are we going to spend this money?" (Interview #3: City employee)

City staff members involved in the creation of the ICSP were typically involved until the planning Charette was held;

> I was part of the management group or stakeholder group behind the scenes organizing how the plan was gonna be organized as well as planning for the Charette that was held. Following the charette my involvement kind of tapered out but leading up to the charette I was heavily involved. (Interview #7: City employee)

It is possible that this collaborative effort led to the institutionalization of a diversity of perspectives, preventing the interests of one group to dominate the newly institutionalized views encapsulated within the concept of sustainability. This may help explain the diversity technocratic views among veteran City employees.

One other explanation for the diversity of beliefs we found among City employees is that the Whitehorse ICSP is truly inclusive of the beliefs of a wide range of staff. If this is the case, social pressures to conform may be unnecessary since the ICSP contains beliefs already accepted by most employees.

It is also possible, however, that the ICSP is not a truly inclusive document and that the views of only some staff have been institutionalized. Indeed, the majority (80%) of respondents reported that they were not directly involved in it's creation. If this is the case, there is another possible explanation for why we did not find strong results demonstrating social pressures influencing environmental beliefs. The Whitehorse ICSP was not officially approved until the end of our data collection phase. It is possible that there was not enough time for a homogeneous workplace culture of sustainability aligned with the newly institutionalized views to develop. Now that the ICSP has been officially approved, it may take time for employees to come to resemble one another in their beliefs. It may be several years before a homogeneous workplace culture of sustainability develops, and, along with it, institutional norms regarding the environmental beliefs we are studying. Once normative beliefs regarding the environment and sustainability have been established, future novice employees who differ from them may be pressured into accepting the institutional beliefs. The present cohort of novice and veteran employees may not differ widely in their environmental beliefs because there were no salient, institutionalized, views of the environment and sustainability prior to the creation of the ICSP.

Employees of both the City and YTG discuss sustainability largely as one would expect, given widely-publicized definitions such as that of the Bruntland Commission. Indeed, one survey participant stated simply, “I accept the Bruntland Definition” (Survey response #20; YTG employee) and offered no further explanation. One YTG employee succinctly described sustainability as “planning in a way our grandchildren will appreciate,” (Survey response #21; YTG employee) highlighting a trend to label sustainability as something done for future generations. Respondents identified prudent use of natural resources, achieving self-sufficiency, and protecting the environment as major themes. Limits to growth, however, were rarely discussed, accounting for only 5% of codes used for definitions of sustainability. Surprisingly, many respondents from the City defined sustainability as a part of City operations and did not discuss it beyond that. Definitions of sustainability included;

> Self-reliance, smart planning, efficient use of resources. (Survey response #2: City employee)
>
> Building infrastructure to minimize environmental Impact and reduce use of non-renewables. (Survey response #10: City employee)
>
> Defined by “Smart Growth” – growth is fiscally environmentally and socially responsible. (Survey response #24: City employee)

After identifying these topics as the dominant themes in definitions of sustainability, we coded our surveys and interviews and compared the proportion of instances each theme came up. These results are presented in Table 4.1.

**Table 4.1: Definitions of Sustainability by Theme for Respondents from Each Organization (N=27 [Respondents])**

| Affiliation | Resources | Our future / future generations | Self-Sufficiency | Environ-ment | City Operation | Limit |
|---|---|---|---|---|---|---|
| % YTG | 17 | 50 | 17 | 17 | 0 | 0 |
| % Whitehorse | 5 | 24 | 14 | 14 | 38 | 5 |

Table 4.1 shows that concern for the future, or future generations, dominates our participant's personal definitions of sustainability. Striving to become more self-sufficient and to protect the environment are also major themes. Prudent use of natural resources is a common theme for YTG employees, but not for those working for the City. It is important to note that 38% of City employees define sustainability as a part of City operations.

The most marked difference in responses for the two groups was that involving City operations. One third (38%) of Whitehorse respondents identified sustainability as something to be achieved within the context of City operations. For example, the definitions of sustainability of several respondents includes:

> Building infrastructure in a way that reduces environmental impact and reduces our reliance on non-renewables, (Survey response #10: City employee)

> It basically comes down to what's the best bang for your buck. (Interview #9: City employee)

There was also a reference to a City policy saying sustainability is:

> Defined by "Smart Growth" – growth is fiscally, environmentally, and socially responsible. (Survey response #24: City employee)

One respondent from the City replied to the question, “what does sustainability mean to you?” by providing an excellent example of how many employees associate sustainability with City policy:

> I think that sustainability to me is things we do. We don’t want to put a burden on future generations. I think it used to be ‘dilution is the solution’ but I think we’re starting to see less of that. I think we have to step back and ensure that we clean stuff up and reduce the impact and change designs. Make them smaller so that, there comes a cost, right? It may be cheap now to build and you need to look at what is the cost to operate in the future. And we need to make sure that we look at the long-term viability of projects and ensure that, it may cost us a little more, but if you expand the life of a project out over several decades that cost isn’t going to be higher and it will save operating costs in the future. We looked at doing that on the new Canada Games Centre. We kept our eye on the operating costs. I think that’s what we want to do, minimize impact on future generations. (Interview #11: City Employee)

Perhaps the most important point contained within the passage above is how the respondent began by providing a general and vague definition of sustainability (concern for future generations), tied it into City policy, and then concluded by framing sustainability as the City saving operating costs so as not to burden future generations. For the City, sustainability is almost always tied to cost efficiency. The theme of “cost saving as sustainability” is an important consideration for the future adaptive capacity of Whitehorse. Cost savings efforts are typically discussed as mitigation projects. For example:

> They start looking at carpooling, even if it’s just with their spouse, instead of using two cars when they drive into town, but they all participate in those types of activities when it costs them. Same with heating. I know a lot of people who are going to green buildings, green homes, they have the oil bill in mind, not greenhouse gasses. That’s a perfect example of where they will participate in, and where they won’t. It’s not out of green ethical issues or premise; it’s out of the checkbook. (Interview #7: City employee)

> I do believe that simple things like spending more money on the upfront construction of buildings, on you know, insulation, putting efficient heat systems in. Ultimately if we could put in biomass that would run effectively um, you know, geoexchange, you know, taking the heat form the earth. Even, I mean even, increased hydro, I mean in a lot of circles people say "don't increase the hydro! That's not sustainable." But, it's green energy in the sense that you're not burning fossil fuels to get it (Interview #8, City employee).

Adaptation strategies can also be cost-savings. However, they often require an up-front investment for projects aimed at providing future returns. Cost saving was a major theme among respondents who defined sustainability in terms of City policy. For example, City employees responded to the questions, "What about your department? Is your department sustainably minded, the people that work for you, work with you?" by stating, for example:

> I think everyone is aiming to reduce costs… I want to make sure the pipes we use are long lasting. I want to make sure we don't increase operating costs… Let's face it, the administration is worried about its operations and maintenance costs. (Interview #9: City employee)

The presence of technocratic beliefs among City employees may promote a "business as usual" approach to sustainability where it is viewed as maintaining the status quo at a "sustainable" cost, rather than exploring potential new options that can permit a continued high quality of life. When sustainability is widely viewed as a cost management strategy, important projects that fall outside the "business as usual" domain may be overlooked, even when they can help make the City more resilient when faced with environmental change. As a result, there is some evidence in our interviews that, in Whitehorse, sustainability is in danger of becoming a new term for business as usual:

> I believe that the basic fundamental principles that we're looking at in the plan [ICSP]. Those are not new to us. Those principles are principles we already have embedded in other policies within the City. The Official Community Plan has those types of policies. Fiscally, we're always looking for more efficient ways of doing business. These are all sustainable principles that we've practiced for years. So I guess one way to look at it is that, by developing and adopting a plan, it formalizes our corporate mentality and corporate objective towards sustainability and growing within our means. But it just formalizes into a plan, we've had embedded into other policies. This basically formalizes it into a plan. (Interview #8: City Employee)

In the context of this passage "growing within our means" refers to "growing within our *financial* means."

Beyond cost savings, many respondents viewed sustainability in terms of minimizing the environmental impact of daily activities. Many of the respondents who defined sustainability in terms of City policy and cost saving also made reference, although sometimes as a brief aside, to reducing environmental impact. The production of household waste and the capacity of the local landfill were often mentioned when referring to local environmental impacts. However, discussions about reducing waste often framed sustainability simply as a lessening of impact, rather than reducing impact to any particular target levels. For example, one respondent reported that,

> Our new garbage trucks are sustainable. They have a higher capacity so you're not running back and forth to the dump and things like that. (Interview #15: City employee)

A lack of clear targets for emissions reductions, environmental impact, or resilience to extreme events, may present itself as a barrier to future adaptation to environmental change. Five participants from the City avoided discussing

specific targets by explaining that they “Can’t do everything right away,” (Interview responses #1, 2, 7, 9: City employees) or that things will “take time” (Survey response #6: City employee) while five others expressed the view that, “I think sustainability is a process. I don’t think it’s an end result” (Survey responses #2 and 21; Interviews #1, 8, and 9: City employees).

Given that sustainability is frequently discussed among City employees, and that policy is often discussed in that context, we hypothesized that there would be social pressures to accept the institutionally accepted views of the concept. Thus, we anticipated institutional differences in definitions of sustainability. The definitions of sustainability by City and YTG staff shared many similarities with the exception that 38% of City employees defined sustainability as a part of City operations. Many City employees discussed sustainability as cost savings, possibly as a result of framing sustainability within an institutional context. It is unlikely that this difference is a result of institutional pressure since only a minority of City employees holds this view. Rather, it is possible that many staff learned of sustainability, a concept that only relatively recently became mainstream and has been embraced by the City, through their job. As such, they may have developed definitions of it within the context in which it is most familiar to them.

***Individual perceptions of sustainability***

Upon review of the data we identified three principal themes in participant's discussions about their workplace culture of sustainability. These are: (1) evaluations of the behaviours and values of their co-workers; (e.g.)

> [We're a] very young and progressive dept. with fresh ideas. (Survey response #13: City employee)

> There is definitely awareness in my office. Recycling and re-using are very well represented here. (Survey response #4: YTG employee)

> [There is a] conscious effort to establish 'green' practices such as recycling, community clean-up, encouraging active living and active transportation, use of alternative energy sources, reducing waste. (Survey response #24: City employee)

(2) the funds made available for sustainability initiatives: (e.g.)

> Q: And a lot of that is about costs. So is it a fair characterization to say that sustainability in Whitehorse is a factor of economics?
> A: Yes it is. (Interview #13: City employee)

> Council made a big deal about sustainability and the Plan. The more these departments work toward sustainability the more they can get to have the gas tax allocated to them. (Interview #14: City employee)

> All the funds that we get through the gas tax suggests that we are doing things in a responsible way. (Interview #9: City employee)

and, (3) assessments of the decisions and perceived attitudes of elected officials (e.g.)

> We [Council] are all about enhancing the quality of life for all Whitehorse citizens, from supporting the kids Rec. Fund and Anti-Poverty Coalition, to making healthy choices possible for all in our community. Parks, playgrounds, trail systems, Canada Games Centre, are just a few examples where the City of Whitehorse has enhanced the quality of life for its residents. (Survey response #19: City employee)

> [The sustainability initiative comes from the Federation of Canadian Municipalities. So at the] Council level they're getting hammered. Any time they do anything with the Federation of Canadian Municipalities, they're hearing about sustainability. (Interview #3: City employee)

> Elected officials override recommendations from political experience and/or political gain. (Survey response #17: YTG employee)

We coded our interviews and surveys in terms of the dimensions of sustainability they reflect. They are presented in Table 4.2.

### *Workplace culture of sustainability*

**Table 4.2: Proportion of Codes for Workplace Culture of Sustainability (N=23 [Respondents])**

| Affiliation | Culture of Sustainability | Reasoning | | | | Total % yes / no |
|---|---|---|---|---|---|---|
| | | *Behaviours* | *Values* | *Not enough $* | *Governance* | |
| % YTG | "NO" | 17 | 0 | 17 | 17 | 51 |
| | "YES" | 33 | 17 | 0 | 0 | 50 |
| % Whitehorse | "NO" | 12 | 6 | 0 | 0 | 18 |
| | "YES" | 35 | 18 | 0 | 29 | 82 |

Upon examination of Table 4.2 it is clear that there are differences in the perceived cultures of sustainability between the City and the YTG. City employees perceive their workplace as more sustainably minded than do those who work for YTG. The majority (82%) of City employees perceive a workplace culture of sustainability while YTG employees are evenly divided between "yes" and "no." However, this distinction may be due to the equalization of sustainability with cost efficiency by many City employees. Respondents from the

City described their elected officials as “progressive” and, although many discussed sustainability as cost-savings, many more mentioned that there is a:

> Conscious effort to establish ‘green’ practices such as recycling, community clean-up, encouraging active living and active transportation, use of alternative energy sources, and reducing waste. (Survey response #24: City employee)

> City respondents articulated that sustainability considerations have become commonplace. One participant mentioned that sustainability is “considered in everything we do” (Survey response #6: City employee) while most who felt positive about their workplace culture related that sustainability is “usually considered on all projects/initiatives.”

In contrast, governance interference was listed as a reason against a workplace culture of sustainability among YTG respondents. Some YTG employees cite the attitudes of elected officials as a barrier to a sustainable workplace. For example, one respondent mentioned, “Elected officials override recommendations from political experience and/or for political gain” (Survey response #13: YTG employee). Another respondent described the belief that policy choices are a reason against a workplace culture of sustainability:

> I believe that the infrastructure funding programs by Canada and developed by Yukon are not sustainable. While programs are meant to lead to reduced GHG, improved air quality etc., the dollars made available lead to large infrastructure projects for communities that cannot afford to operate after completed. Not always, but often. (Survey response 2: YTG employee)

This quote suggests that YTG funding programmes, such as the ICSP, are perceived by some of their own employees to be essentially infrastructure projects leading to high future operating costs. YTG respondents were generally optimistic about the sustainable values and behaviours of their colleagues, but differed from City respondents in mentioning that they do not believe elected officials are on

board, and expressed concerns about meeting the potential costs associated with sustainable initiatives. For example:

> Yes. It is possible for the City to be sustainable in many ways. However, if transfer of funds were halted I do not believe the City has the tax base to sustain its infrastructure. (Survey response #6: YTG employee)
>
> The dollars made available lead to large infrastructure projects for communities that cannot afford to operate after completed. Not always, but often. (Survey response #17: YTG employee)

### *Local culture of sustainability in Whitehorse*

Yes/no responses for whether or not participants perceive a culture of sustainability within Whitehorse mirror the data on the perception of a sustainability-minded workplace culture. However, the reasoning is very different. Data were classified into categories according to the same codes used for Table 4.2 (with the exception of one describing concern over costs) and are presented in Table 4.3

**Table 4.3: Proportion of Codes for Local Culture of Sustainability (N=25 [Respondents])**

| Affiliation | Culture of sustainability | Reasoning | | | Total % yes / no |
|---|---|---|---|---|---|
| | | *Behaviours* | *Values* | *Governance* | |
| % YTG | "NO" | 14 | 28 | 14 | 56 |
| | "YES" | 14 | 28 | 0 | 42 |
| % Whitehorse | "NO" | 17 | 11 | 0 | 28 |
| | "YES" | 0 | 55 | 17 | 72 |

Among all respondents, the values of local people are the most often cited reasons both for and against sustainability. In contrast, Table 4.2 showed that behaviours were the most oft-cited justification for a workplace culture of

sustainability. Many respondents explained that there is a progressive mindset emerging in the Yukon that will help the region become more sustainable. For example, one respondent mentioned that there are "many people trying to save untouched parts of Yukon" (Survey response #6: YTG employee). Three respondents explained that they have the impression that "people in Whitehorse value sustainable development," (Survey response #6: YTG employee; Survey response #13: City employee; Interview #3: City employee) and one mentioned residents have a "close connection to the environment. Protection of wilderness spaces is important to Whitehorse residents – more so than in southern Canada" (Survey response #6: YTG employee). One respondent described a very progressive local approach to sustainability, but warned that this view is certainly not universal:

> There is a major segment of the population that is interested in sustainability (organic, local farming, active transportation, composting). However, there is another segment that is not (driving huge vehicles, idling, opposed to bike lanes). (Survey response #5: City Employee)

This counter-sustainability perspective is described well by another respondent:

> There's what they like to call the "Yukon Mentality." We have all this space, why don't we use it? We're in the Yukon. We have all this space, why do we have to be right on top of each other? You know, people want they're space, they don't want development on top of them, there's a really big NIMBY factor here. I would say there's starting to be a change in that though. There's more Yukon lifestyle becoming "let's be compact so we don't have to impact the surrounding wilderness, so we don't have to impact the wildlife corridors, so we don't have to impact the greenspace, let's be denser." So there's a good contingent of people who are sort of leaning in that direction. (Interview #13: City Employee)

This "Yukon Mentality," although mentioned as a concern by several respondents, appears to be fading. Descriptions of the "Yukon Mentality" were often qualified with, "but that's changing". One possible explanation for this

change is that immigrants from the South are bringing new ideas to the region. One participant explained, “No [we don’t have a culture of sustainability]. But as more people move here from the South, it is leaning in that direction” (Survey response #14: City employee). The “Yukon Mentality” was not articulated as a personal belief by any of our respondents. While some constituents of the elected officials may have this mentality, the notion that it “is changing” appears to be sufficient to convince officials that they do not need to make concessions for people holding this belief. However, many City staff described a need for more “local buy-in” if the City is to move more quickly toward sustainability. For example,

> Yeah, you have to get the buy-in. You have to get people to understand. The president of our real estate planning board, for example, who participated in one of our projects, has called our project a pile of crap. So he’s one that does not buy into what we’re trying to do. But sometimes it takes a knock on the head and a hit in the pocketbook, seriously, for people to say, ok, I get it. (Interview #1: City employee)

> [It is possible to be sustainable in Whitehorse] but will take a lot of education for the taxpayers to buy-in. (Survey response #5: City employee)

The perception of a local culture of sustainability appears to be related to institutional affiliation. When providing reasoning for or against such a culture, respondents often described how their constituents respond to policies crafted by their own employment institution. City employees cite public participation in City initiatives such as recycling and composting as evidence that Whitehorse is a generally sustainability-minded place. YTG employees, however, often base their appraisals on Territorial policy;

> Some people “get it” but most don’t. Yukon is a mining-based

> economy, still focused on resource extraction. It's also primarily supported by massive federal subsidies more than anything else. If Yukon had to live "sustainably" it'd all be hunter / gatherers and few people want to go there. (Survey Response #29: YTG Employee)

***Is sustainability possible in Whitehorse***

We coded our responses using six categories. Geography, values, funding, and opportunities for improvement were the dominant themes in responses to these questions. For example;

> The City is too spread out (employment too far from residential). (Survey response #17: City employee)
>
> Too much reliance on outside resources. Climate limits agriculture location limits resource potential, population limits densities and thresholds. (Survey response #7: City employee)
>
> Difficult with extreme climate, remote location. (Survey response #12: City employee)
>
> Not if current lifestyle expectations continue. (Survey response #15: YTG employee)
>
> It's [sustainability] not our thing. (Survey response #21: City employee)
>
> We are limited by our location – difficult to supply our own food; travel out of the territory involves great distances. However, people can choose to live near work, to commute by bike, public transit, to buy local food. The City and other organizations can improve their waste management, energy efficiency, switch to renewable energy, provide fuel-efficient vehicles. There is major room for improvement. (Survey response #23: City employee)

The results of this analysis are presented in Table 4.4.

**Table 4.4: Proportions of Codes for Is Sustainability Possible in Whitehorse (N=26 [respondents])**

| Affiliation | Response | Reasoning | | | | | Total % yes / no |
|---|---|---|---|---|---|---|---|
| | | *Geography* | *Values* | *Not enough $* | *Opportunities for improvement* | *"Yes" or "No" only* | |
| % YTG | "NO" | 20 | 20 | 10 | 0 | 0 | 50 |
| | "YES" | 10 | 0 | 30 | 10 | 0 | 50 |
| % Whitehorse | "NO" | 20 | 0 | 0 | 0 | 12 | 32 |
| | "YES" | 6 | 6 | 6 | 40 | 6 | 64 |

As shown in Table 4.4, the City and YTG are divided in their beliefs in the potential for sustainability in Whitehorse. City employees are more optimistic than those of YTG. However, fewer respondents believe in the possibility of sustainability than they do in a culture of sustainability. Responses to this question differ from responses to the previous two in that values play only a minor role. Interestingly, more respondents claim that values are a reason why Whitehorse cannot become sustainable, a reversal of the views articulated in responses to the previous two questions.

As with the perception of a local culture of sustainability, the institutional lens through which respondents view the question “Is it possible to be sustainable in Whitehorse?” appears to affect their perception. City employees are divided 64%/34% in favour of the potential for sustainability while YTG employees are evenly divided. Forty percent of City employees cite opportunities for improvement as a reason why Whitehorse can become sustainable while only 10% of YTG employees share this view. For example, one City respondent explained:

> Major sustainable avenues are available (i.e. Geothermal energy could sustainably heat all of Whitehorse and produce electrical needs) GHG emissions could be reduced immediately. (Survey response #17: YTG employee).

Another believes that the challenges presented by geography also present opportunities,

> We are limited by our location – difficult to supply our own food; travel out of the territory involves great distances. However, people can choose to live near work, to commute by bike, public transit, to buy local food. The City and other organizations can improve their waste management, energy efficiency, switch to renewable energy, provide fuel efficient vehicles. There is major room for improvement. (Survey Response #20: City Employee)

Forty percent of YTG employees list funding as the main factor influencing the possibility of sustainability in Whitehorse while the same is true for only 6% of City employees. One of the most important findings in Table 4.4 is that YTG employees see a lack of funds as a barrier to sustainability, while Whitehorse employees do not. YTG respondents articulated the belief that, for example,

> It is possible for the City to be sustainable in many ways. However, if transfer of funds were halted I do not believe the City has the tax base to sustain its infrastructure. (Survey Response #21: YTG Employee)

> [Whitehorse cannot become sustainable because it is] too small and would have to raise taxes sky high. (Survey response #13: YTG employee)

Not surprisingly, respondents from each institution describe geography as a barrier to sustainability. For example, one respondent explained that, “The city is too spread out” (Survey response #1: City employee) while another, commented that sustainability is not possible due to “previous poor planning” (Survey response #16: City employee). This sentiment is articulate by another respondent who commented that:

> [We] cannot become sustainable because] land planning and watercourse protection seem to be hap hazard and without an eye on future generation's needs and protecting water course environment. (Survey response #19: YTG employee)

Some respondents saw Whitehorse's unique geography as an advantage. One individual described how she believes the City's proximity to nature can help it become sustainable,

> I think this is one of the few places left on the planet where people realize that if we can't be sustainable, the environment is directly affected. It is not a large, sprawling city like Toronto. You can still see nature out your back door or office window. You realize that if you throw something away it will be stuck in a tree when you drive home! (Survey Response #4: YTG Employee)

In the context of our research, participants discussed climate change, and adaptation to environmental change, as sustainability. In some ways, sustainability is, again, in the context of our research, a good proxy with which to study climate change adaptation. The ICSP outlines strategies that can help the City adapt to environmental changes and discussions of sustainability among City employees often relate to the ICSP. Sustainability, and climate change, were discussed primarily in terms of mitigating processes by our City respondents. Sustainability was discussed as cost-mitigation while climate change strategies, when discussed, was also viewed as mitigation (e.g., emissions reduction). The relative homogeneity between these two terms allowed us to assess the perceptions of respondent's perceived relationships to the environment through their definitions of sustainability. However, climate change and sustainability are not entirely synonymous for our participants and thus sustainability on its own was not an ideal way to discuss climate change adaptation.

While sustainability is a concept that focuses on human actions, climate changes relates not only to human actions, but environmental conditions and the potential hazards they present to human populations. While sustainability may imply that behavioural modifications are being undertaken to mitigate a potential risk, climate changes deals more directly with potential risks. The concept of sustainability deals with the relationship between beliefs and values, environmental action, and how empowered individuals feel to successfully take action. This concept, however, does not directly consider the perception of a specific threat or whether or not the threat is to a valued object. This is an important dimension in clearly mapping the link between beliefs and actions (Stern 2000). Sustainability is a good proxy for discussing climate change adaptation in the context of our research, and can perhaps serve as a proxy for climate research in general in similar contexts. However, if sustainability discourse is to be used as a proxy to examine climate change adaptation it is important to include an assessment of the perceptions of hazards and threats posed by climate change as well.

The next section will elaborate on the findings presented in this discussion of the perceptions of sustainability by exploring how members of the City and YTG perceive the Whitehorse ICSP.

### 4.3 Employee Perceptions of the Whitehorse ICSP

This section explores how members of the City of Whitehorse and the YTG perceive the Whitehorse Integrated Community Sustainability Plan (ICSP). It

examines participant's views of its purpose, strengths and weaknesses, utility, chances of success, and relevance.

### *Purpose of the Whitehorse ICSP*

Integrated Community Sustainability Plans for all Yukon municipalities are created using a template provided by the YTG. According to YTG documents and study participants, the intended purpose of the exercise of creating an ICSP is to enable municipalities to gain access to gas tax funding and to develop a plan for their future development. This is reflected in responses from YTG staff that reported the purpose of the ICSP is to access gas tax funding, develop infrastructure, become more self-sufficient, and improve efficiency. In contrast, no respondents from Whitehorse describe the purpose of the ICSP as a tool for accessing gas tax funding. The perception of the purpose of the ICSP among City participants was primarily for self-reliance, but also divided among several other dimensions. The frequency of responses used in this analysis can be found in Table 4.5.

**Table 4.5: The Purpose of the Whitehorse ICSP (N=31 [respondents])**

| Question | Codes | Frequency (Overall) | Frequency (Whitehorse) | Frequency (YTG) |
|---|---|---|---|---|
| What is the purpose of the ICSP? | guideline | 4 | 4 | 0 |
| | access gas tax | 3 | 0 | 3 |
| | less reliance on non-renewables | 1 | 1 | 0 |
| | self reliance | 15 | 13 | 2 |
| | efficiency | 1 | 0 | 1 |
| | infrastructure | 2 | 0 | 2 |
| | less environmental impact | 4 | 4 | 0 |
| | future generations | 1 | 1 | 0 |

The responses of City employees are somewhat in conflict with the wording of the ICSP approved by the City. The Whitehorse ICSP document begins by introducing the need to replace aging infrastructure,

> Like many urban communities across Canada, Whitehorse's existing infrastructure is aging and needs to be replaced. There is not the ability for municipalities across Canada to raise the dollars necessary to repair and replace infrastructure and to manage growth. Municipalities do not have the legislated ability to raise the amount of money necessary to respond to what has been referred to as the "infrastructure deficit". (Cabott, 2007)

No respondents from the City identified replacing infrastructure as one of the purposes of the ICSP. The ICSP document continues to state that its purpose is to access funding from the Gas Tax Agreement. Again, no City respondents identified this dimension. The ICSP document adds that it is also aimed at providing a long-term vision for the City and to, "develop a comprehensive sustainability plan and strategic plan" (Cabott, 2007).

Based on our interview and survey responses to the question "what is the purpose of the ICSP", it appears that YTG employees are better acquainted with the declared purpose of the ICSP than are Whitehorse employees. Indeed, 50% of YTG respondents who replied to the question "Did you have any input into developing the sustainability plan?" replied "yes." This was true for only 19% of City respondents. Considered along with the findings presented in Table 4.5, this suggests that familiarity with the ICSP may affect participant's responses to the questions regarding the strengths and weaknesses, utility, chances of success, and relevance.

Although there are differences in how employees of the City and YTG perceive sustainability and the purpose of the ICSP, there is general agreement on the ICSP's strengths and weaknesses. We identified major themes discussed by our respondents and coded our interviews and surveys using these themes as codes. The most common themes were the strength of the vision provided, tempered with a view that the plan is difficult to implement. For example;

> It gives the City backing for future choices but is very daunting to implement. (Survey response #2: City employee)
>
> There are lots of great ideas in the plan ranging from small to large. The problem is that many will be difficult to implement. (Survey response #1: City employee)
>
> I think a plan and vision for the future ensures we move forward in a positive way. (Survey response #19: City employee)

The results of this analysis are shown in Table 4.6.

**Table 4.6: Strenghts and Weaknesses of the Whitehorse ICSP (n=17 [respondents])**

| Question | | Codes | Frequency (Overall) | Frequency (Whitehorse) | Frequency (YTG) |
|---|---|---|---|---|---|
| Strengths and weaknesses of the ICSP | strengths | vision | 4 | 3 | 1 |
| | | flexibility | 3 | 1 | 2 |
| | | improve efficiency | 1 | 0 | 1 |
| | | focuses on infrastructure | 1 | 1 | 0 |
| | weaknesses | difficult to implement | 7 | 5 | 2 |
| | | focus on infrastructure | 1 | 0 | 1 |

The primary strengths identified by participants are that the Whitehorse ICSP provides a vision and is a flexible plan. City employees have mentioned, for example:

> Its strength is that there's the vision of what and where we should be going over the next 50 years. (Interview #4: City employee)
>
> I think a plan and vision for the future ensures we move forward in a positive way. (Survey #19: City employee)
>
> I think it's important to set goals and provide a vision. (Survey response #25: City employee)
>
> [The strengths of the plan are that it provides an] opportunity for citizen involvement, there is a well-staffed planning department that provides flexibility, and there is value placed on retaining wilderness quantity and quality. (Survey response #6: YTG employee)
>
> We have identified things we want to do and what we're going to do about it. We've implemented it now into the Official Community Plan so it becomes a broader document that can be more flexible. I think the way we want our community to go with the sustainability plan can be, we can do that. (Interview #9: City employee)

The greater research literature on adaptive capacity discussed in the previous chapters suggests that flexibility is a key component of resilience since it allows communities to adapt to changing environmental conditions. However, the realization of benefits from the flexibility of the ICSP may be impeded by difficulties in its implementation. Implementation problems are listed as the primary weakness of the Whitehorse ICSP, for example:

> What I'm concerned about is Council's implementation or direction that we give to staff with regard to this plan because in some cases we're moving to implement things that are contained in the plan quicker than people in Whitehorse are willing to go. And that's my biggest concern about the plan. It's good but if you rush into implementation you're going to get such kickback from the community that there won't be any councilors around, any of this group, to implement the plan. (Interview #15: City employee)
>
> I'm perhaps worried that its weaknesses are going to be that it's asking for too many things that need some dollars attached to

> them and right now we're really struggling with budget issues. (Interview #7: City employee)

> There are lots of great ideas in the plan ranging from small to large. The problem is that many will be difficult to implement. (Survey response #2: City employee).

The limitation that will likely have the strongest effect on adaptive capacity is that of cost. If the City develops infrastructure that is expensive to maintain, or if future funding is less than expected, it may not be possible to implement new projects that a flexible ICSP would permit. As one City employee explains:

> The weakness is that it's not always possible to achieve that [the goals outlined in the plan]. In fact, it won't be possible to achieve much of it in the timeframes that are there due to any number of reasons. One of the biggest is funding. If there's a cost attached to something the funds have to be found and it's not always the easiest thing to do. It's important work, some of it is certainly just changing attitude of how we doing things but there are a number of parts that are going to require funding and that may not be possible to achieve. So that's really one of the biggest weaknesses of any plan like that. It can be a wonderful plan but if it can't meet those goals it kind of falls flat on its face after a while if you don't do anything about it. (Interview #4: City employee)

Adaptive *capacity* and actual adaptation are different (Adger, 2003). The flexibility of the ICSP may improve adaptive capacity in one regard, but this capacity may be diminished by implementation problems, resulting in less actual adaptation, should the need arise.

An additional weakness described by one participant from the City highlights another barrier to implementation:

> The plan does not yet have dedicated staff to ensure it moves forward. It lacks detail at the level of scheduling daily activities and transitioning to these targets. (Survey response #20: City employee)

Indeed, all the participants we interviewed reported that the ICSP does not affect their daily activities in any concrete way and at the time of our interviews there was no staff dedicated to the plan[4]. The ICSP document (Cabott, 2007) describes an extensive list of goals but provides no measurable targets or timelines. Our data reflect this in that the goals set out in the ICSP have not yet been operationalized into the day-to-day business of the City.

The lack of concrete goals was mentioned in almost every interview we conducted. No staff member from the City was aware of how the City, or their department, would be held accountable for achieving any goals set out by the ICSP. The following excerpts from two interviews highlight the confusion among City employees regarding their responsibilities to fulfill the goals of the ICSP;

> **Q:** So, is there anyone that you have to report back to? Is there anything that you're required to report on? Or is there something new you're required to do as a result of this plan?
>
> **A:** There may be, I don't know personally. That we have to report or anything like that. Whenever there's funding there's conditions on it. I believe there's a mechanism there to show completion or something but as far as our day-to-day operation I would say no. (Interview #7: City Employee)
>
> **Q:** So now that the plan [ICSP] is out and it's formalized, are there any formal obligations that you have that you didn't have before the plan was out?
>
> **A:** That's a good question. And the short answer is yes, but we're working on it… So we've used an off-the-shelf "See It" model. So we're using that. Now with that come obligations. The See It model can't stay static. It's not designed to stay static. It's designed to be continually updated and very honestly with the last, uh, we've been developing it, and it still needs some development, and you know, benchmarks and thresholds so we can measure ourselves through time. That's what it's designed to do. Are we there yet? No. (Interview#11: City Employee)

[4] The City has recently hired a Sustainability coordinator

The City and YTG employees that participated in this study universally regard the ICSP as a good plan. However, its lack of institutionalization into City policy has been identified as a major weakness. The following excerpt from an interview provides insight into the ICSPs present place in City policy;

> **Q:** So what are some of the weaknesses of the plan [ICSP]?
>
> **A:** Um, there was a lot of good goals I would say in all different aspects of the plan, but I don't think there was enough done in concrete steps but I don't see enough of a follow-up product for that. It's sort of been dropped off.
>
> **Q:** So how has the plan [ICSP] affected your department in the way that things are done day-to-day?
>
> **A:** Um, I don't think it has to tell you the truth. A lot of the ideas that come out of the plan we were already familiar with. As a conscientious city planner you have to be aware of all the different aspects of sustainability and be familiar with Smart Growth, building practice, land development, you know, all these different aspects of what sustainability is. So I would say it hasn't really impacted us.
>
> **Q:** So do you have to record anything you've done with regard to the plan yet or is it, as you said, just following…
>
> **A:** Not yet.
> (Interview #5: City Employee)

This passage highlights, as mentioned before, that sustainability is viewed as a part of City policy. Surprisingly, there is a lack of definable, measurable goals for achieving sustainability targets. Without goals, or a formal reporting procedure the ICSPs credibility may be diminishing. Thirty-nine percent of participants report that they believe the plan is realistic. However, the majority (71%) of those who believe the plan is realistic believe so only if it becomes more

institutionalized into City operations. Several respondents describe the need for an institutionalized plan. For example:

> Yes [the plan is realistic], provided that the City dedicates staff to ensure the plan moves from a document to part of day-to-day business, policies and procedures. (Survey response #23: City employee)

> There were a lot of good goals I would say in all different aspects of the plan but I don't think there was enough done in concrete steps but I don't see enough of a follow-up product for that. It's sort of been dropped off. (Interview #5: City employee)

> The goals that we have set for ourselves are attainable if there is consistency within council and if we manage to fill the position of sustainability coordinator that there will be a continuance of this because we can't… I can't see us loading this on to somebody else to do it to make it happen and this is where budget input, it's up to us to look at the budget and make it happen. (Interview #13: City employee)

Table 4.7 shows the frequencies for "yes" and "no" responses to the questions; is the plan useful, realistic, and needed.

**Table 4.7: Frequency Distribution for Perceptions of the Whitehorse ICSP (n=31 [respondents])**

| | Is the ICSP useful | | Is the ICSP realistic | | Is the ICSP needed | |
|---|---|---|---|---|---|---|
| | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** |
| **City** | 22 | 0 | 7 | 7 | 21 | 0 |
| **YTG** | 6 | 0 | 0 | 4 | 4 | 0 |
| **Total** | 28 | 0 | 7 | 11 | 25 | 0 |

The finding presented in Table 4.7 that, while the ICSP is unanimously perceived as both useful and needed, the majority of respondents do not believe it is realistic is somewhat surprising. However, a closer examination of our interview and survey data reveals that the reasons given supporting these responses are

often non-specific. For example, many participants discussed the utility of the plan in the following ways:

> Yes, it enables funding. (Survey response #6: YTG employee)
>
> Preparation is good. (Survey response #18: City employee)
>
> It's important to set goals and provide a vision. (Survey response #25: City employee)
>
> It increases awareness, creates a starting point. (Survey response #24: City employee)

On the other hand, some respondents from the City cited specific reasons for why the plan is needed and useful, for example;

> We have to look at issues of infrastructure now. (Survey response #13: City employee)
>
> [The ICSP] provides an argument for any future decisions towards sustainability. (Survey response #2: City employee)
>
> People need to be aware and accountable to what is going on. (Survey response #6: City employee)
>
> A clear plan will prevent spontaneous mistakes. (Survey response #19: City employee)

Most survey respondents who provided specific reasons were from the YTG, citing examples such as,

> It's [the ICSP] required for Gas Tax agreement. (Survey response #12: YTG employee)
>
> [The ICSP] should be foundation of OCP. Separate sustainability plan may just restate existing policy etc. (Survey response #20: YTG employee)
>
> Yes, [the ICSP will] control interests, maintain wilderness, lessen boom & bust, deal with high fuel costs. (Survey response #7: YTG employee)

These examples demonstrated why *a* plan is needed, but did not speak specifically to the Whitehorse ICSP and so failed to identify strengths of this particular plan.

Table 4.7 identified less codes for "is the ICSP realistic" than for the other two categories, useful and needed. This is because in our interviews we found many of our respondents gave neither yes nor no responses. Rather, they often preferred to state that it is realistic "to a degree." Examples of these responses primarily discussed uncertainties such as funding described above in the discussion on weaknesses, reinforcing that these issues are indeed threats to the success of the ICSP. For example:

> Yeah, I think it's realistic to a degree. You can only do things incrementally when you've got the cash. You need a source of money to do it. People talk about affordable housing and you can't do it without funding. That can determine what you can do, and you have to make choices. (Interview #3: City employee)

> **Q:** Do you see it as a realistic plan?
>
> **A:** Um, for the most part. Again, it just comes down to dollars. When something's going to require some investments and things like that that's always the question mark but, maybe the timelines aren't right or, but I mean, they're pretty far away as it so I guess it's pretty realistic I guess. (Interview #7: City employee)

> **Q:** So do you see the plan as realistic then?
>
> **A:** I see it as realistic in that it's a lot of stuff to work towards but not in the sense that these are things that are going to happen tomorrow. That's just not how planning works. (Interview #12: City employee)

# Chapter 5: Conclusions

## 5.1 Summary of Results

Our analysis found evidence of institutional differences in environmental beliefs, but inconclusive results regarding the influence of institutional cultural norms on these beliefs. We found weak evidence that on-the-job socialization influences environmental beliefs that are salient in a workplace context, such as technocratic beliefs. Our small sample size for YTG respondents and a strong outlier prevented us from drawing firm conclusions regarding our results for technocratic beliefs. However, given the magnitude of the difference in the distribution of technocratic beliefs between veteran and novice YTG employees, a larger sample size would likely identify a significant difference.

We found no evidence to directly support the idea that on-the-job socialization influences environmental beliefs that are not salient in a workplace context. This suggests that for the beliefs of individuals to be affected by institutional cultural norms, these norms must be salient in the day-to-day business of the institution. However, we found evidence that the environmental beliefs of novice employees mirror those of veteran employees of the organization that employs them on most dimensions of environmental orientation. This suggests that social forces may in fact be shaping the beliefs of our participants to some extent, either through on-the-job socialization or selective hiring.

Our study found that the greatest perceived strength in the ICSP is its flexibility. This flexibility can enhance adaptive capacity by reducing the time it takes to

approve projects aimed at responding to changing environmental conditions (Adger, 2003; Portes, 2006). The greatest perceived weakness of the ICSP was described as problems in implementation, including a lack of funding. YTG employees most directly articulated this later point, although it was acknowledged by several of our interview participants from the City.

Only one respondent identified the ICSP's focus on infrastructure as a weakness. However, this point should not be overlooked. Adaptation to environmental change requires not only technological proficiency, but also ecological integrity. Given that funding is a potential barrier to the implementation of the ICSP, the implementation of low-cost projects focused on, for example, ecosystem services or energy conservation, could help increase resilience and reduce costs in the future (Heal, 2000). Failure to consider these types of projects may present a barrier to adaptation.

### 5.2 Strengths and Weaknesses of the Methodology

This study was able to make a relatively comprehensive assessment of environmental orientation by using a validated scale (the NEP) to investigate environmental beliefs and values (Olsen et al., 1993). By completing a preliminary assessment of the local context, we were able to design an interview schedule and questionnaire that reflected locally relevant issues regarding sustainability, and the influence of beliefs on a relevant policy. Our statistical analyses allowed us to evaluate both differences in environmental orientation

between groups, and to test the effect of social pressures to conform to institutional belief norms.

Our analysis is limited by our methodological focus on the influence of institutional affiliation of environmental beliefs. The environmental orientation scores used in analysis were group averages based only on institutional affiliation. Our discussion could have benefited from dividing respondents into groups based on index scores for environmental orientation. By doing this we could potentially have identified stronger, more direct, relationships between particular sets of beliefs, and perceptions of sustainability and environmental policy. If, for example, respondents were divided based on their level of technocratic belief, we would have been able to examine the particular effects of this belief on policy. Our methodology limited us to comparisons of group *tendencies* toward a particular belief, rather than the direct effect of beliefs on policy.

### 5.3 Contribution to the Literature

Our review of the greater literature found that little, if any, research has been done on the influence of institutions on personally held beliefs and that connections between environmental beliefs and actions have primarily been explored at the individual scale. Our review also demonstrated that the effect of group membership on personally held beliefs remains largely unexplained to-date.

Our results suggest that institutional cultural norms do have an effect on the individually held beliefs of members of organizations. Thus, group membership likely plays a role in influencing personally held beliefs. This influence likely extends only to beliefs that are salient in common group practices. We found no direct evidence that groups have any influence on beliefs that are not commonly activated in a group context.

Our examination of environmental beliefs among employees of the City of Whitehorse and YTG suggest that social context has an influence on personal beliefs at much finer scales than previously thought. Cultural differences in beliefs have traditionally been studied on national and “ethnic” scales. These findings have lead some to conclude that cultural differences can only be identified “between societies rather than individuals” (Oreg and Katz-Gerro, 2006:466).

Our review of the New Institutional Analysis literature demonstrated that social actors are constantly interacting with myriad institutions, occupying a diversity of social roles. While an occupant of an institutional role, the behaviour of a social actor is constrained by behaviour guiding structures; both general cultural, and specific institutional, norms. General cultural norms influence many aspects of social life, however, societies are not culturally homogeneous and these norms do not apply to everyone. One commonly cited example of this is that there can be both differences in norms among “ethnicities” within a particular society, and different norms among members of those ethnicities with different income levels

(so-called social “classes”). Social “classes” themselves can have different sets of norms based on, for example, regional differences within a particular society.

Institutional analysis can contribute to the study of the influence of particular “cultures” on beliefs by dividing the commonly used large, non-specific, “national” and “ethnic” levels of analysis into smaller, more specific, meaningful categories. This can allow cultural differences in beliefs and values, such as environmental orientation, to be observed at a finer scale. This can help increase understanding of how beliefs are formed and potentially shed light on why some groups engage in less pro-environmental actions than others. By using relatively neutral groups such as, for example, employment organization, this type of analysis can help reduce potentially insulting and prejudicial claims regarding the beliefs and values of members of particular national or “ethnic” groups. This could not only make it more acceptable to explore and discuss differences in beliefs between groups, but also increase the validity of results by greatly reducing the scale of analysis.

This type of analysis can have implications for climate change adaptation by shedding light on potential social barriers to adaptive capacity among governance institutions. It would surprise no one to claim that politics is not value-free, however, our review of the literature suggests that little is known about the complex relationship between institutions, environmental beliefs, and environmental policy. Our results suggest that the three are related and interact in a way that can have consequences on policy decisions.

A potential next step in the analysis of the effect of institutional cultural norms on environmental beliefs and policies could be to examine the relationship between specific environmental orientations, such as technocratic and non-technocratic beliefs, and perspectives on environmental policy. The literature could benefit from a future study directly connecting environmental orientation with perspectives on environmental concepts and policy. Such a study could begin by identifying the beliefs of individuals through survey methods. It could then follow-up with interviews investigating how holders of particular beliefs perceive concepts such as sustainability, conceptualize threats such as climate change, and judge how policy should be designed to address these issues. Once connections between environmental beliefs and environmental policies have been firmly established institutional cultural assessments will be able to predict potential future policy directions of governance institutions.

### 5.4 Policy Contributions to the Whitehorse Context

Our literature review commented that it is "easier for political actors to work with the grain of institutions than against it" (O'Riordan and Jordan, 1998:83). Our analysis permitted us to map the institutional "grain" of the City regarding environmental orientation and perceptions of sustainability. This permitted us to assess institutional strengths and weaknesses regarding the potential to successfully implement sustainability policy in Whitehorse.

From our analysis of environmental beliefs, it appears that the City of Whitehorse is well equipped to adapt to potential future climate impacts. Employees at all levels expressed a willingness to become sustainable and many felt that it was in their power to do so. The diversity of environmental orientations among City employees can contribute to adaptive capacity. The City does not have a linear set of environmental beliefs employees are pressured into accepting. This prevents barriers discussed in the introduction such as the action paradox, and pluralistic ignorance. The diversity of perspectives among employees will likely improve prospects for adaptation (Adger, 2003) and facilitate any necessary institutional reorganization that may be required to adapt to fast-paced changes such as environmental change (Portes 2006).

The widely articulated view of sustainability-as-cost-savings held by City employees presents a potential barrier to adaptive capacity because it focuses exclusively on operating costs. Identifying potential future costs that may result from environmental changes is an overlooked and crucial component of adaptive capacity. This weakness could potentially be addressed by developing sustainability projects aimed at generating an economic return such as energy efficiency retrofits for all City buildings.

Although the City has much potential for adaptation, we found evidence that the ICSP, in its present state, may hinder adaptation. Presently, there are no concrete goals nor mechanisms for ensuring accountability to the principles set out in the ICSP.

Whitehorse is an isolated Northern city whose geography presents many challenges to sustainability. As the global climate changes, Whitehorse may be forced to adapt to local environmental change. The principles of self-sufficiency outlined in the Whitehorse ICSP can help the City become more resilient. However, these principles must be converted from policy into practice if the City is to develop its potential for adaptation and convert this capacity into resilience.

### 5.6 Concluding Remarks on Sustainability

The general open-ended ambiguity of the term “sustainability” leaves it vulnerable to a wide range of interpretations. As such, sustainability is subjected to constant reinterpretation in different contexts. For example, some decision-makers in our study dismissed the idea as an over-used green washed term and reinterpreted it as accepted best practice for business as usual approaches. We often encountered the sentiment that sound fiscal management leads to a “sustainable” cash flow allowing the City to “sustain” operations. Thus, as half our interview participants concluded, sustainability is already being implemented and the City is already “sustainable” in many ways. When adjustments to the status quo were deemed necessary for sustainability we found that it was typically discussed as a “process,” more than as an “end result” reflected in organizational and lifestyle changes. Some participants were quick to identify themselves as sustainable, explain why, and expose contradictions in the “so-called” sustainable actions of their colleagues and the general public. This is understandable given the lack of consistency surrounding the definition of the

term. Without a well-articulated and widely accepted definition of sustainability the term risks acquiring different definitions in different contexts. As such, “sustainability” projects risk falling well short of their intended goals.

Our study found that sustainability is often discussed in terms of fiscal management. Sustainability as cost savings is a pervasive idea that will not likely be dismissed due to its broad appeal. Nor should it. Institutions already have well-refined techniques for ensuring their operations are financially sustainable. If institutions can incorporate the potential costs associated with future environmental changes and current non-optimal energy use into their definitions of sustainability, the accounting techniques used for sustainability as cost savings can help organizations achieve their environmental aims.

Our respondents often discussed how the future of any sustainability projects would depend on the funds being made available to implement them. This suggests that, although often defined as a part of day-to-day City operations, specific projects aimed at increasing “sustainability” are viewed as something external to regular practices, and as a cost, rather than an investment. Our respondents likely articulated these views since sustainability projects are a part of the ICSP, a document separate from normal operations that is dependent on external funding. It is important to note that although sustainability is often discussed in terms of expenses it was not perceived by any participant as a way to reduce costs. This is understandable given that the ICSP has a strong focus on infrastructure. Expanding the focus of sustainability projects to include low-

cost and cost-recovery projects can help reduce implementation problems presented by cost.

Many governance institutions, such as the City of Whitehorse, are making a genuine effort to become more sustainable. Given that cost is major consideration for sustainability projects, marketing sustainability as not only “the right thing to do” for future generations and the environment, but as a way to reduce costs and gain financial security, may increase both the support for, and effectiveness of, sustainability policy.

## References


Abrahamson, E. (1996). Management fashion. *Academy of Management Review, 21*, 254-285.

ACIA (Ed.). (2005). *Arctic climate impact assessment: Perspectives in a warming arctic*. Cambridge, UK: Cambridge University Press.

Adger, W. N. (2000). Social and ecological resilience: Are they related? *Prog. Hum. Geogr.,* , 347.

Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development, 13*, 921-931.

Adger, W. N. (2003). Social capital, collective action, and adaptation to climate change. *Economic Geography, 79*(4), 387-404.

Arcury, T. A., & Christianson, E. H. (1990). Environmental worldview in response to environmental problems: Kentucky 1984 and 1988 compared. *Environment and Behavior, 22*(3), 387-407.

Argyis, C. (1999). *On organizational learning*. Oxford, UK: Wiley-Blackwell.

Argyis, C., & Schon, D. (1996). *Organizational learning: Theory, method and practice*. Reading, MA: Addison-Wesley.

Ashworth, R., Boyne, G., & Delbridge, R. (2009). Escape from the iron cage? organizational change and isomorphic pressures in the public sector. *J Public Adm Res Theory, 19*(1), 165-187.

Atwood, M. (2004). *Survival: A thematic guide to canadian litterature*. Toronto: McClelland & Stewart.

Berkes, F., Bankes, N., Marschke, M., Armitage, D., & Clark, D. (2005). Cross-scale institutions and building resilience in the canadian north. In R. Huebert, H. Fast, M. Manseau & A. and Diduck (Eds.), *Breaking ice: Renewable resource and ocean management in the canadian north* (pp. 225-248). Calgary, AB.: U. Calgary Press.

Berkes, F., & Jolly, D. (2002). Adapting to climate change: Social-ecological resilience in a canadian western arctic community. *Conservation Ecology, 5*(2)

Blass, T. (1999). The milgram paradigm after 35 years: Some things we now know about obedience to authority. *Journal of Applied Psychology, 29*(5), 955-978.

Bruntland, G. H. (1987). *Our common future: Report of the world commission on environment and development*. Oxford: Oxford University Press.

Cabott, L. (2007). *Whitehorse integrated community sustainability plan*. Whitehorse, YT: City of Whitehorse.

Card, R. F. (2005). Individual responsibility within organizational contexts. *Journal of Business Ethics, 62*(4), 397-405.

Carson, R. (1962). *Silent spring*. New York: Mariner Books; Anv edition (October 22, 2002).

Cohen, S., Demeritt, D., Robinson, J., & Rothman, D. (1998). Climate change and sustainable development: Towards dialogue. *Global Environmental Change, 8*(4), 341-371.

Costanza, R., d'Argec, R., de Grootd, R., Farbere, S., Grassob, M., Hannonf, B., et al. (1997). The value of the world's ecosystem services and natural capital. *Nature, 387*(15 May 1997), 253-260.

Daily, G. C. (1997). *Nature's services: Societal dependence on natural ecosystems*. Washington D.C.: Island Press.

Daily, G., Soderqvist, T., Aniyar, S., Arrow, K., Dasgupta, P., Ehrlich, P., et al. (2000). The value of nature and the nature of value. *Science, 289*(5478), 395.

Davenport, T., & Prusak, L. (1998). *Working knowledge: How organizations mannage what they know*. Boston, MA: Harvard Business School Press.

Dietz, T., Ostrom, E., & Stern, P. (2003). The struggle to govern the commons. *Science, 302*, 1907-1912.

Dietz, T., Stern, P. C., & Rycroft, R. W. (1989). Definitions of conflict and the legitimation of resources: The case of environmental risk. *Sociological Forum, 4*(1), 47-70.

DiMaggio, P. J., & Powell, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147.

Dunlap, R. E., & Van Liere, K. (1978). The new environmental paradigm. *Journal of Environmental Education, 9*, 10-19.

Dunlap, R. E., Van Liere, K., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues, 56*(3), 425-442.

Dunlap, R., E. (2008). The new environmental paradigm scale: From marginality to worldwide use. *The Journal of Environmental Education, 40*(1), 3-18.

Eichler, M. (1999). Sustainability from a feminist sociological perspective: A framework for disciplinary reorientation. In Becker, E., Jahn, T. (Ed.), *Sustainability and the social sciences: A cross-disciplinary approach to integrating environmental considerations into theoretical reorientation* (pp. 182-206). London, New York.: Zed Books.

Fiori, S. (2002). Alternative visions of change in douglass north's new institutionalism. *Journal of Economic Issues, 36*(4), 1025-1043.

Gaines, S. O. J., Marelich, W. D., Bledsoe, K. L., Steers, W. N., Henderson, M. C., Granrose, C. S., et al. (1997). Links between race/ethnicity and cultural values as mediated by racial/ethnic identity and moderated by gender. *Journal of Personality and Social Psychology, 72*(6), 1460-1476.

Hannigan, J. A. (1995). *Environmental sociology: A social constructionist perspective*. New York: Routledge.

Heal, G. (2000). *Nature and the marketplace: Capturing the value of ecosystem services*. Washington D.C.: Island Press.

Helliwell, J. (2001). Social capital, the economy and well-being. In K. Banting, A. Sharpe & F. St-Hilaire (Eds.), *The review of economic performance and social progress: The longest decade: Canada in the 1990s* (pp. 43-60). Montreal, QC: McGill-Queens University Press.

Hodgson, G. M. (2003). The hidden persuaders: Institutions and individuals in economic theory. *Cambridge Journal of Economics, 27*(2), 159-175.

Hofstede, G. (1984). . Newbury Park, London, New Dehli: Sage Publications.

Hotimsky, S., Cobb, R., & Bond, A. (2006). Contracts or scripts? A critical review of the application of institutional theories to the study of environmental change. *Ecology and Society, 11*(1), 41.

Jepperson, R. L. (1991). Institutions, institutional effects, and institutionalism. In W. Powell, & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 143-163). Chicago: University of Chicago Press.

Jones, R. E., & Dunlap, R. (1992). The social bases of environmental concern: Have they changed over time? *Rural Sociology, 57*(1), 28-47.

Kaiser, F., Hubner, G., & Bogner, F. (2006). Contrasting the theory of planned behavior with the value-belief-norm model in explaining conservation behaviour. *Journal of Applied Social Psychology, 35*(10), 2150-2170.

Kaplan, R. B. (1966). Cultural thought patterns in inter-cultural education. *Language Learning, 16*(1-2), 1-20.

Kawachi, I. (1999). Social capital and self-rated health: A contextual analysis. *American Journal of Public Health, 89*(8), 1187.

Kelly, P. M., & Adger, W. N. (2000). Theory and practice in assessing vulnerability to climate change andFacilitating adaptation. *Climatic Change, 47*(4), 325.

Kelman, H. C., & Hamilton, V. L. (1989). *Crimes of obedience: Toward a social psychology of authority and responsibility*. New Haven and London: Yale University Press.

Mahalingam, A., & Levitt, R. (2007). Institutional theory as a framework for analyzing conflicts on global projects. *Journal of Construction Engineering and Management, 133*(7), 517.

March, J., & Olsen, J. (2005). *Elaborating the "new institutionalism"* Unpublished manuscript.

Nee, V., & Ingram, P. (1998). Embeddedness and beyond: Institutions, exchange, and social structure. In M. C. Brinton, & V. Nee (Eds.), *The new institutionalism in sociology* (pp. 19-45). New York: Russle Sage Foundation.

Olofsson, A., & Ohman, S. (2006). General beliefs and environmental concern: Transatlantic comparisons. *Environment and Behavior, 38*(6), 768-790.

Olsen, M., Ladwick, D., & Dunlap, R. (1991). *Viewing the world ecologically*. Boulder, Colorado: Westview Press.

Oreg, S., & Katz-Gerro, T. (2006). Predicting proenvironmental behavior cross-nationally: Values, the theory of planned behavior, and value-belief-norm theory. *Environmenta and Behavior, 38*, 462-483.

O'Riordan, T., & Jordan, A. (1999). Institutions, climate change and cultural theory: Towards a common analytical framework. *Global Environmental Change, 9*(2), 81.

Ostrom, E. (1986). An agenda for the study of institutions. *Public Choice, 48*, 3-25.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for*

*collective action*. Cambridge, UK: Cambridge University Press.

Pelling, M., & High, C. (2005). Understanding adaptation: What can social capital offer assessments of adaptive capacity? *Global Environmental Change, 15*(4), 308.

Poltorak, M., Leach, M., Fairhead, J., & Cassell, J. (2005). 'MMR talk'and vaccination choices: An ethnographic study in brighton. *Social Science Medicine, 61*(3), 709.

Ponting, C. (1993). *A green history of the world. the environment and the collapse of great civilizations* . New York: Penguin Books.

Poortinga, W., Steg, L., & Vlek, C. (2004). Values, environmental concern, and behavior: A study into household energy use. *Environment and Behavior, 36*(1), 70-93.

Portes, A. (2006). Institutions and development: A conceptual reanalysis. *Population and Development Review, 32*(2), 233.

Powell, W., & DiMaggio, P. J. (Eds.). (1991). *The new institutionalism in organizational analysis*. Chicago: University of Chicago Press.

Prentice, D. A., & Miller, D. T. (1996). Pluralistic ignorance and the perpetuation of social norms by unwitting actors. In M. P. Zanna (Ed.), *Advances in social psychology* (pp. 161-210). San Diego: Academic Press.

Santino, J. (1990). The outlaw emotions: Narrative expressions on the rules and roles of occupational identity. *American Behavioral Scientist, 33*, 318-329.

Satterfield, T. A., Mertz, C. K., & Slovic, P. (2004). Discrimination, vulnerability, and justice in the face of risk. *Risk Analysis, 24*(1), 115-129.

Schluter, A. (2007). Institutional change in the forestry sector - the explanatory potential of new institutional economics. *Forest Policy and Economics, 9*(8), 1090.

Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology, 56*, 391-406.

Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology, 36*(4), 457-475.

Scott, W. R. (1995). *Institutions and organizations*. Thousand Oaks: SAGE.

Slovic, P., Malmfors, T., Krewski, D., Mertz, C. K., Neil, N., & Bartlett, S. (2005). Intuitive toxicology II: Expert and lay judgments of chemical risks in canada. *Risk Analysis, 15*(6), 661-675.

Stacey, R. (1996). *Complexity and creativity in organizations*. San Francisco: Berett-Kholer Publications.

Staub, E. (2000). Genocide and mass killing: Origins, prevention, healing and reconciliation. *Political Psychology, 21*(2), 367-382.

Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56*(3), 407-424.

Stern, P., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behavior, 25*(3), 322-348.

Stern, P., Kalof, L., Dietz, T., & Guagnano, G. (1995). Values, beliefs, and proenvironmental action: Attitude formation toward emergent attitude objects. *Journal of Applied Social Psychology, 25*(18), 1611-1636.

Stern, P. C., Dietz, T., & Guagnano, G. A. (1995). The new ecological paradigm in social-psychological context. *Environment and Behavior, 27*(6), 723-743.

Swart, R., Robinson, J., & Cohen, S. (2003). Climate change and sustainable development: Expanding the options. *Climate Policy, 3S1*, S19-S40.

Torgler, B., & García-Valiñas, M. A. (2007). The determinants of individuals' attitudes towards preventing environmental damage. *Ecological Economics, 63*(2-3), 536-552.

Valentino, B., Huth, P., & Balch-Lindsay, D. (2004). "Draining the sea": Mass killing and guerrilla warfare. *International Organization, 58*(2), 275-407.

Van Liere, K. D., & Dunlap, R. E. (1980). The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly,* , 181-197.

Waller, J. (2002). *Becoming evil: How ordinary people commit genocide and mass killing*. Oxford; New York: Oxford University Press.

Yukon Territorial Government. (2007). *Gas tax fund.* Retrieved February 3, 2009, from http://www.infrastructure.gov.yk.ca/gas_tax/html/icsp.html

**Appendix A – Interview Schedule**

## Whitehorse Sustainability Study Questionnaire

## INTRODUCTION:

*As you likely know, the City of Whitehorse has been developing a "Sustainability Plan" (the Integrated Community Sustainability Plan). I am a master's student from the University of British Columbia and part of a research team funded by the International Polar Year's Community Adaptation and Vulnerability in Arctic Regions (CAVIAR) project. I would greatly appriciate your participation in this study by completing this questionnaire. Your participation will help the City of Whitehorse become better equipped to deal with challenges posed by a chancing climate.*

*In this questionnaire I would like to ask you some questions about this "Sustainability Plan" and how it may affect what you do in your job. In addition, I would like to ask you some questions about how you understand sustainability itself.*

*This questionnaire contains two sections. In the first section you will be asked to provide brief answers to sustainability related questions. In the second section you will be asked to indicate the degree to which you agree or disagree with a list of statements regarding sustainability by circling a number on a scale.*

**Section 1: Short Answer Questions**

## THE WHITEHORSE SUSTAINABILITY PLAN:

1. Are you aware of the (Integrated) Whitehorse Sustainability Plan?
   YES ___ NO ___

IF YES:

What is your **general understanding** of its purpose? Can you think of any specific examples of how the Plan aims to make Whitehorse more sustainable?

_____

_____

_____

_____

2. Did you have **any input** into developing the Sustainability Plan?
   YES ___ NO ___

IF YES:

- Did you volunteer or were you seconded?
- In what role or capacity did you contribute?
- Were your ideas reflected in the plan when it came out?

IF NO:

- Is there any particular reason that you weren't involved?

3. What do you think are **the strengths and weaknesses** of the Sustainability Plan?

- Overall, would you say that the completed Sustainability Plan provides a good environmental strategy for Whitehorse? Why / Why Not?
- Do you think the Sustainability Plan is practical and realistic?
- Do you think the Plan is really needed now?
- Do you think it will be needed more in the future?

4 Does the Sustainability Plan provide any **specific targets or goals for your unit / department?**

- Is your Department/Unit held accountable in any way in terms of whether it follows the Sustainability Plan?
- How are (or might) the goals of the Sustainability Plan be measured in terms of what your Department / Unit does?
- Does your Department/Unit have any specific budget to help it meet the goals of the Sustainability Plan?
- Does your Department/Unit have to provide any report on its "sustainability performance" or any record of its success in achieving sustainability goals?
- If I were to try and find any evidence of the impact of the Sustainability Plan on your Department/Unit, where might I find it?

5. Does the Sustainability Plan affect **what you do in your job** now in any way? [Ask either (yes) or (no) below:

IF YES:

- How? Do you have to do any specific tasks in conjunction with the Plan?
- In your work, do you have any budget that is earmarked in any way as being related to sustainability goals?
- Is there anything you can point to with respect to your own work that involves a sustainability approach? Is this the result of the Sustainability Plan, or would you be doing that in any case?
- Do you have to provide any sort of report or record related to sustainability generally or the goals of the Sustainability Plan?
- Do you think that the Plan will affect what you do ***in other ways*** in the future?

IF NO:

- Why is that the case?
- Do you think that the plan will affect the work that you do in the future? In what ways?
- In your work, do you have any budget that is earmarked in any way as being related to sustainability goals?

- In your work, are there things that you do that you think of as involving sustainability, but that are not the result of the Sustainability Plan?
- In your work, do you have to provide any sort of report or record related to sustainability generally or the goals of the Sustainability Plan?

**GENERAL PERSPECTIVES ABOUT SUSTAINABILITY:**

6. What is your understanding or perception of the meaning of sustainability?

7. Do you think that being sustainable is part of the general culture within Whitehorse? Do you think that is changing?

8. Do you think there is a 'culture of sustainability' in the City of Whitehorse administration itself? Do you think that is changing?

9. Do you think that it is possible to achieve Sustainability in a sub-Arctic community such as Whitehorse?
   - What does it mean to be 'sustainable' in this context?

## Appendix B – Mail-in survey

### Whitehorse Sustainability Study Questionnaire

INTRODUCTION:

This questionnaire seeks your answers to questions about the nature of sustainability in the north.

- In the **First Section** you will be asked questions about what you know about the Integrated Community Sustainability Plan of the City of Whitehorse, and about your views of it.

- In the **Second Section**, you will be asked some general questions about how you understand 'sustainability'.

- In the **Third Section**, you will be asked to answer a number of 'fixed choice' questions about our general views regarding environmental change.

- In the **Fourth Section**, you will be asked a few questions about yourself.

As described in our accompanying letter, the information you provide will contribute to a larger study of how the City of Whitehorse is dealing with issues of social, economic and environmental change. It will also be a basis for the M.A. thesis of Nathan Vadeboncoeur who is working as part of the research group examining issues of sustainability and governance in Whitehorse. Your answers will remain confidential and our reports and papers will not identify any individual respondent either by name or position.

Your willingness to take about 20 minutes to complete this questionnaire and mail it back to us is very much appreciated.

Thank you.

Ralph Matthews, Ph.D.,
- Professor of Sociology, The University of British Columbia
- Principal Investigator

## SECTION I: THE WHITEHORSE SUSTAINABILITY PLAN:

1. Are you aware of the Integrated Whitehorse Sustainability Plan?

YES ___ NO ___

**IF YES: PLEASE ANSWER ALL PARTS OF QUESTIONS 2 AND 3 BELOW.**

**IF NO: PLEASE SKIP DIRECTLY TO QUESTION 4.**

2 **(a).** What is your **general understanding** of its purpose? Can you think of any specific examples of how the Plan aims to make Whitehorse more sustainable?

_____

_____

_____

_____

2 **(b).** From what you know, what would you say are the strengths and weaknesses of the plan?

_____

_____

_____

2 **(c).** Do you think it is a useful plan for Whitehorse? Why or why not?

_____

_____

2 **(d).** Do you think it is it a realistic plan? Why or why not?

_____

2 **(e).** Is the plan needed? Why or why not?

3. Did you have **any input** into developing the Sustainability Plan?

**Yes:** ___
**No:** ___

**If yes**: How were you involved? What was your role?

**If no**: Do you think you should have been involved or consulted? Is there any reason you can think of why you were not?

## SECTION II: GENERAL PERSPECTIVES ABOUT SUSTAINABILITY

1. What is your understanding or perception of what sustainability is/means?

2. Do you think sustainability is part of the general culture of Whitehorse?

**Yes:**_____
**No:**_____

Please Explain:

3. Do you think sustainability is part of the culture of your own department, and/or those with whom you work most closely in other departments or organizations?

**Yes:** _____
**No:** _____

Please explain:

4. Do you think it's possible to be sustainable is a city like Whitehorse? Please explain.

**Yes:**___
**No:**___

Please explain:

**Appendix C – Questionnaire**

## SECTION III: ENVIRONMENTAL ATTITUDES AND VALUES

Please indicate BY CIRCLING A NUMBER the extent to which you AGREE OR DISAGREE with each of the following statements.

1 = strongly agree, 2 = agree, 3 = mildly agree, 4 = mildly disagree, 5 = disagree, 6 = strongly disagree.

| | Agree → Disagree |
|---|---|
| **1.** Protecting the environment is beneficial for human health. | 1 2 3 4 5 6 |
| **2.** I am willing to pay a carbon tax on gasoline. | 1 2 3 4 5 6 |
| **3.** I am willing to pay extra income tax for environmental protection. | 1 2 3 4 5 6 |
| **4.** Environmental protection provides me with better opportunities for recreation. | 1 2 3 4 5 6 |
| **5.** The most important thing about nature is that it produces the things we need. | 1 2 3 4 5 6 |
| **6.** Reducing our impact on the environment will improve our quality of life. | 1 2 3 4 5 6 |
| **7.** To address environmental problems we must change our behaviours. | 1 2 3 4 5 6 |
| **8.** Environmental degradation will damage the economy. | 1 2 3 4 5 6 |
| **9.** Although climate change will have a considerable impact on small rural communities in the North, Whitehorse will be relatively sheltered from climate change effects. | 1 2 3 4 5 6 |
| **10.** Part of sustainability is making our community a better place to live. | 1 2 3 4 5 6 |
| **11.** Environmental protection is an expensive luxury. | 1 2 3 4 5 6 |
| **12.** Part of sustainability is developing a | 1 2 3 4 5 6 |

common community image.

**13.** The general public views sustainability much the same way I do. 1 2 3 4 5 6

**14.** The people I work with view sustainability much the same way I do 1 2 3 4 5 6

**Please indicate, BY CIRCLING A NUMBER the extent to which you AGREE or DISAGREE with the following statements.**

**NOTE: The scale has changed to a five-option scale.**

1 = strongly agree, 2 = agree, 3 = neutral, 5 = disagree, 6 = strongly disagree.

Agree → Disagree

**15.** The so-called "ecological crisis" facing humankind has been largely exaggerated. 1 2 3 4 5

**16.** The earth has plenty of natural resources, we just need to learn how to develop them. 1 2 3 4 5

**17.** Humans have a right to modify the environment to suit their needs. 1 2 3 4 5

**18.** If things continue on their present course we will soon experience an ecological catastrophe. 1 2 3 4 5

**19.** Plants and animals have as much right to exist as humans. 1 2 3 4 5

**20.** Human ingenuity will ensure that we do NOT make the earth unlivable. 1 2 3 4 5

**21.** The balance of nature is strong enough to cope with the impacts of modern industrialized nations. 1 2 3 4 5

**22.** Humans will eventually learn enough about nature to be able to control it. 1 2 3 4 5

**23.** The balance of nature is very delicate and easily upset. 1 2 3 4 5

## Section IV: Questions About Your Own Background

a) Who is your **current** employer (please select all that apply)?

City of Whitehorse:_____

Yukon Government:_____

A First Nation:_____

Environmental Organization: _____

Other (please specify) _____

b) How many years have you worked for the organization listed above? _____

c) How many years of employment experience do you have **with other organizations?**

Years: _____

Organization name: _____

d) What is your gender? Male : _____ Female: _____

f) What is your highest level of formal education (grade/degree)? _____

e) In what year were you born? _____

g) What is your approximate TOTAL ANNUAL personal income (please check one)?

Less Than $20,000:___

$20 000 – 39 999:___

$ 40 000 – 59 999:___

$60 000 – 79 999:___

$80 000 – 99 999:___

$100 000 or more:___

## Appendix D – Codes used in qualitative analysis

Personal definition of sustainability: Prudent use of natural resources, for the sake of future generations, self-reliance, for the sake of the environment, City operations, there is a need to live within limits.

Culture of sustainability in Whitehorse: Yes/no, because of people's behaviours or values, the actions of elected officials governance.

Culture of sustainability within one's workplace: Yes/no, (because of people's) behaviours or values, the actions of elected officials governance.

Is it possible to be sustainable in Whitehorse: Yes/no, the way humans interact with the environment, local geography, people's values, opportunities for improvement, not enough funding.

What is the purpose of the ICSP: To build infrastructure, to provide a vision for the community, as a planning tool, to make Whitehorse sustainable.

What are the strengths of the ICSP: It provides a vision, it is flexible, it is inclusive of the whole community, is aimed at improving environmental conditions.

What are the weaknesses of the ICSP: Focus on infrastructure only, difficulties in it's implementation (may not be realistic), it doesn't go far enough.

Is the ICSP useful: Yes/no (all answers were 'yes'), it helps improve urban density, it enables funding, it sets out a plan to help achieve goals.

Is the ICSP realistic: Yes/no, it's flexible, it's inclusive of the community so people are on-board, yes only if it's concrete, geographic barriers, not feasible.

Is the ICSP needed: Yes/no (all answers were 'yes'), needed to enable funding, needed to control special interest, needed to promote sustainability, needed to help improve infrastructure, need to provide a vision/plan.

**Appendix E – Contact letter**

THE UNIVERSITY OF BRITISH COLUMBIA

Date:

**Dept. of Sociology**
6303 N.W. Marine Drive
Vancouver, B.C. Canada V6T 1Z1

Tel : 604-822-2878
Fax : 604-822-6161
www.soci.ubc.ca

Dear:_____

Recently my colleague Robin Sydneysmith and I had the opportunity to interview you as part of our study of the factors that contribute to the City of Whithorse's capacity to respond to and deal with the risks and challenges associated with social, economic and environmental change. We are still conducting interviews with other folks in Whitehorse including City employees and folks connected with the Yukon Government. We believe that our subsequent report on our findings in 2009 will make a contribution to both the general understanding of how governments plan and deal with vulnerabilities. We also hope that it will be of some benefit to you as you carry out your work.

**While I am very conscious that we have imposed significantly on your time, I am writing now to ask whether it is possible for you to provide just a little more of your time to assist a graduate student who is working with us on this project.**

**Nathan Vadeboneour is studying in the Institute for Research Management, Environment and Sustainability (IRES) at U.B.C. For his Masters thesis, he wants to examine how sustainability is understood by those involved in civic government in Whitehorse, particularly in the context of the City of Whitehorse Sustainability Plan**. Nathan's work is funded, in part, by a student research grant from International Polar Year funding, and in part by our project that is also funded by an IPY grant. Our grant is part of CAVIAR (Community Adaptation and Vulnerability in Arctic Regions) and is one of many projects being carried out by CAVIAR research in nine countries bordering on the Arctic Circle.

**Nathan would like to talk to you for about 30-35 minutes about these issues of sustainability**. The information that he gets for you will form the basis of his thesis research. It will also be used by us as part of our analysis as we did not focus on sustainability and the Whitehorse Sustainability Plan in our earlier conversation with you.

I would be most grateful if you would spare this additional time to meet and talk with Nathan about your perspective on sustainability and the Whitehorse sustainability plan.

Nathan will be contacting you in the next week to find out of you are willing to give him this half hour of additional time, and to see if he can schedule a face-to-face interview with you at a time and place that is convenient for you. The information that you discuss will remain strictly confidential; you will not be identified, nor will your name be used in any written reports or documents without your advance, written consent.

If you have any questions please feel free to contact me at the number or e-mail by my name below, or my Co-Investigator, Dr. Robin Sydneysmith at 604-822-0924 (e-mail: robin.sydneysmith@ubc.ca). You may also contact Nathan at [604-569-3948, e-mail: nathanvadeboncoeur@gmail.com]. If you have any questions about your rights as a research participant, please feel free to contact The University of British Columbia Research Subject Information Line at 604-822-8598.

Sincerely,

Dr. Ralph Matthews, Principal Investigator,

Email: ralph.matthews@ubc.ca / Tel: (604) 822-4386

## Appendix F – Rotated component matrices

The four rotated component matrices used to select components for statistical analysis are presented below in order.

**Rotated Component Matrix[a]**

| | Component | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Q1 | .699 | .193 | .315 | .284 | .432 | -.018 | .026 | .247 | .158 |
| Q2 | .281 | .609 | .162 | .020 | .213 | .482 | -.032 | -.139 | .291 |
| Q3 | .592 | .412 | .118 | .117 | .613 | .213 | -.024 | -.060 | .112 |
| Q4 | .418 | .834 | .125 | .126 | .092 | .050 | .023 | -.068 | -.011 |
| Q5 | .108 | -.002 | .139 | .124 | .187 | .033 | .155 | .911 | .116 |
| Q6 | .908 | .007 | .046 | .290 | .104 | -.047 | -.092 | .081 | .090 |
| Q7 | .543 | .698 | .185 | -.171 | -.105 | .060 | .117 | .231 | .189 |
| Q8 | .453 | .408 | .328 | .209 | .616 | .022 | .110 | .081 | .094 |
| Q9 | -.125 | .113 | -.212 | .765 | -.218 | -.189 | .088 | .183 | -.354 |
| Q10 | .795 | .420 | .315 | .082 | -.043 | .086 | .072 | -.088 | .110 |
| Q11 | -.570 | .047 | -.011 | -.093 | -.550 | .073 | -.122 | .535 | -.066 |
| Q12 | .250 | .049 | .152 | .918 | .112 | -.017 | .039 | -.026 | -.018 |
| Q13 | .414 | .173 | -.112 | .331 | -.145 | .178 | .376 | .365 | -.517 |
| Q14 | .115 | .649 | -.360 | .312 | .086 | .349 | -.273 | .132 | -.093 |
| Q15 | -.822 | -.262 | -.122 | .057 | -.364 | -.271 | .012 | -.090 | -.103 |
| Q16 | -.877 | -.149 | .163 | .274 | -.170 | -.050 | .131 | .166 | .124 |
| Q17 | -.329 | -.188 | -.405 | -.008 | -.189 | -.066 | .621 | -.432 | -.032 |
| Q18 | .221 | .045 | .843 | .172 | -.034 | .081 | -.229 | .184 | .030 |
| Q19 | .066 | -.119 | .966 | -.149 | -.006 | -.026 | -.045 | -.027 | -.044 |
| Q20 | -.126 | -.153 | .032 | -.063 | -.020 | .099 | .876 | .213 | -.119 |
| Q21 | -.699 | -.529 | -.088 | -.110 | -.108 | -.075 | .181 | -.123 | -.098 |
| Q22 | .126 | .197 | -.393 | .320 | .007 | .080 | .640 | .045 | -.001 |
| Q23 | .517 | .515 | -.216 | -.122 | .081 | -.290 | -.092 | .211 | .148 |
| EMPL | .037 | .003 | .050 | -.142 | -.228 | .911 | .006 | .175 | .094 |
| YREMP | .470 | .106 | .284 | .253 | .055 | .337 | .082 | .326 | .587 |
| OTHEMP | -.491 | .478 | -.050 | -.447 | .021 | -.148 | .259 | -.227 | .276 |
| GENDER | .559 | .432 | .169 | .220 | -.204 | .459 | -.089 | -.207 | -.244 |
| EDU | -.077 | -.050 | -.148 | -.184 | .831 | -.215 | -.138 | .229 | -.210 |
| AGE | .118 | .187 | .055 | -.282 | -.154 | .125 | -.105 | .112 | .849 |
| INCOME | .057 | .309 | .771 | .067 | .081 | .177 | .019 | .055 | .260 |
| AWARE | .004 | .221 | .078 | -.020 | .168 | .708 | .507 | -.110 | .107 |
| WHSUST | .902 | .173 | .132 | .120 | -.198 | -.004 | .009 | .105 | .011 |

Extraction Method: Principal Component Analysis.

## Appendix F (cont.)

**Rotated Component Matrix[a]**

| | Component | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Q1 | .691 | .314 | .202 | .228 | .420 | -.071 | .279 | -.030 |
| Q2 | .310 | .088 | .816 | -.059 | -.199 | -.108 | -.212 | .186 |
| Q3 | .631 | .133 | .608 | .083 | .027 | -.096 | .385 | .040 |
| Q4 | .703 | -.005 | .457 | -.002 | .101 | -.138 | .069 | -.164 |
| Q5 | .159 | .051 | -.093 | .080 | .907 | .000 | .240 | .043 |
| Q6 | .834 | .074 | -.062 | .273 | .091 | -.154 | .153 | .177 |
| Q7 | .760 | .121 | .248 | -.308 | .325 | .039 | -.122 | -.057 |
| Q8 | .580 | .343 | .464 | .195 | .099 | .041 | .429 | -.030 |
| Q9 | -.028 | -.208 | -.120 | .793 | .046 | .174 | -.282 | -.142 |
| Q10 | .836 | .291 | .299 | .017 | .017 | -.042 | -.176 | .025 |
| Q12 | .316 | .115 | .107 | .800 | .218 | -.053 | .016 | .012 |
| Q17 | -.303 | -.326 | -.118 | -.045 | -.413 | .704 | -.071 | -.015 |
| Q18 | .271 | .836 | -.035 | .125 | .063 | -.240 | .041 | .202 |
| Q19 | -.049 | .957 | .006 | -.086 | .023 | -.096 | -.079 | -.127 |
| Q20 | -.245 | .067 | .073 | .017 | .320 | .820 | -.114 | -.123 |
| Q22 | .254 | -.267 | .118 | .270 | -.205 | .748 | .019 | .211 |
| Q23 | .768 | -.214 | -.023 | -.250 | .135 | -.080 | .215 | -.239 |
| EMPL | -.015 | .062 | .168 | -.212 | .103 | .029 | -.008 | .891 |
| YREMP | .497 | .258 | .247 | -.027 | .617 | -.028 | -.101 | .335 |
| EDU | .064 | -.075 | -.205 | -.109 | .188 | -.121 | .914 | -.024 |
| AGE | .286 | .070 | .057 | -.628 | .278 | -.085 | -.246 | .282 |
| INCOME | .223 | .791 | .238 | -.152 | .140 | .041 | .012 | .107 |
| AWARE | -.090 | .048 | .750 | -.058 | .196 | .399 | -.179 | .130 |
| WHSUST | .874 | .169 | -.141 | .108 | -.019 | -.018 | -.077 | .252 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

## Appendix F (cont.)

**Rotated Component Matrix[a]**

| | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Q1 | .319 | .411 | .309 | .528 | -.128 | -.188 | .029 |
| Q2 | .894 | .107 | .076 | -.127 | -.151 | .006 | -.030 |
| Q3 | .846 | .096 | .011 | .268 | .047 | .000 | -.111 |
| Q4 | .261 | .689 | .021 | .291 | -.336 | -.044 | .014 |
| Q6 | .518 | .204 | -.054 | .613 | .350 | .025 | -.150 |
| Q7 | .145 | .768 | .006 | .253 | .199 | -.053 | .174 |
| Q9 | -.032 | -.501 | -.313 | .450 | -.106 | .083 | .376 |
| Q10 | .615 | .328 | .347 | .285 | .200 | -.106 | .172 |
| Q12 | .041 | .218 | .143 | .760 | .012 | .005 | -.052 |
| Q17 | -.037 | -.396 | .192 | -.419 | .072 | .559 | .015 |
| Q18 | .016 | -.234 | .744 | .029 | .082 | -.089 | -.013 |
| Q19 | .228 | -.033 | .531 | -.092 | .044 | -.632 | .238 |
| Q20 | -.073 | -.024 | -.068 | -.060 | .065 | .146 | .914 |
| Q22 | .085 | -.018 | -.088 | .030 | .020 | .849 | .308 |
| Q23 | .059 | .747 | .077 | .075 | .069 | -.021 | -.173 |
| EMPL | .209 | .029 | .103 | -.143 | .815 | -.020 | .153 |
| YREMP | .025 | .285 | .774 | .031 | -.092 | .101 | -.021 |
| EDU | -.368 | .051 | -.083 | .294 | .734 | .068 | -.124 |
| INCOME | .161 | .250 | .581 | .165 | .047 | -.196 | -.272 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 11 iterations.

## Appendix F (cont.)

**Rotated Component Matrix[a]**

| | Component | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Q1 | .422 | .418 | .460 | .288 | -.087 | -.124 |
| Q2 | .902 | .131 | -.058 | .092 | -.061 | -.056 |
| Q3 | .824 | .109 | .292 | .054 | .122 | -.124 |
| Q4 | .284 | .660 | .349 | -.065 | -.310 | .031 |
| Q6 | .425 | .127 | .663 | -.131 | .424 | -.081 |
| Q7 | .185 | .764 | .277 | .023 | .136 | .092 |
| Q9 | -.129 | -.556 | .372 | -.209 | -.119 | .447 |
| Q10 | .525 | .307 | .396 | .281 | .273 | .205 |
| Q12 | .064 | .168 | .733 | -.029 | .034 | .029 |
| Q17 | .043 | -.334 | -.614 | -.120 | .208 | .216 |
| Q18 | .114 | -.084 | -.089 | .653 | .169 | -.077 |
| Q19 | .106 | .060 | .069 | .874 | -.016 | .075 |
| Q20 | -.138 | -.021 | -.072 | .069 | .008 | .893 |
| Q22 | .117 | -.088 | -.156 | -.554 | .178 | .595 |
| Q23 | .002 | .750 | .153 | -.059 | .097 | -.109 |
| EMPL | .152 | .095 | -.097 | .190 | .764 | .068 |
| EDU | -.526 | -.018 | .271 | -.147 | .648 | -.013 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

**Appendix G – Ethics Board Certificate of Approval**

# THE UNIVERSITY OF BRITISH COLUMBIA

**Behavioural Research Ethics Board_Office of Research Services**_Suite 102, 6190 Agronomy Road_Vancouver, BC V6T 1Z3_Tel: (604) 827-5114 Fax: (604) 822-5093_E-mail: breb.rise@ors.ubc.ca

**To:** Matthews

, D. Ralph
Sociology

**Date:** **January 12, 2009**

**Subject:** H07-02746

(Amendments to Study)

Whitehorse CAVIAR Project
Principal Investigator: D. Ralph Matthews

**This is an automatically generated email sent to the Principal Investigator and Primary Contact; Please do not reply.**

The Post Approval Activity (PAA) for the application identified above was reviewed by the Research Ethics Board and has been approved.

_For Renewals & Amendments:_Please click on the following link to view your approval certificate: RISe

- This link will take you to the RISe homepage whereby you must log on using your CWL login to access the above mentioned application

- Once you have gained access to the PAA Homepage, click the “View” link located next to the subheading, “PAA Approval Certificate” on the right side of the screen

Or you may take the following steps to view your approval certificate:

- Log on to RISe (http://rise.ubc.ca/rise) using your CWL login

- Locate and click the above application title under the “Human Ethics” tab then click on the "View" link located next to the subheading "Current Approval Certificate" on the study homepage

For Acknowledgements: _Please click on the link (http://rise.ubc.ca/rise) to view your approved acknowledgement

- This link will take you to the RISe homepage whereby you must log on using your CWL login to access the above mentioned application

- Locate and click the above application title under the “Human Ethics” tab, that will take you to the study homepage. Then select the "Post Approval Activities" tab on click on the name of approved acknowledgement to view the PAA homepage for that acknowledgement

- Once you have gained access to the PAA Homepage, click the “View” link located next to the subheading, “PAA Approval Certificate” on the right side of the screen

If you have any questions regarding this notification, please contact your REB Administrator.