Newfound Opportunity?
The potential impacts of climate change on the tourism industry of western Newfoundland

by

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Authors Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The purpose of this research was to assess the potential impact of climate change on the western Newfoundland tourism industry. Western Newfoundland was chosen as it has a variety of recreational activities that attract tourists.

To this end, a mixed methods approach was deemed most appropriate. It allowed for the use of the qualitative procedures of interviews and document analysis as well as the quantitative procedures of statistical climate modeling.

The qualitative research demonstrated that there was a desire for further growth in the tourism industry and a general lack of concern for the affects of climate change. The quantitative methods projected that three different recreational and tourism activities studied in this thesis could be altered by climate change. Of the tourism industries examined, snowmobiling was projected to suffer shortened seasons, skiing was projected to see slight losses or to maintain its current season length, and golf was projected to extend its season and increase the number of playable rounds. When the two methods were integrated, there was a gap between the potential changes in the tourism industry and the lack of adaptation plans from the province or the tourism sector.

Based on these findings, a series of recommendations were made to the Newfoundland and Labrador Department of Tourism, Culture and Recreation and various tourism operators. This research will contribute a new perspective to the substantial existing literature on tourism, to the growing research on climate change, and to the essential research on Newfoundland and Labrador.

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I would like to thank Dr. Dan Scott, of the University of Waterloo, for sparking my interest in climate change and for providing the various models used in this thesis, and Dr. Don Reid of the University of Guelph, first for letting me sit-in on his course on rural tourism and for being an external committee member in this process. And, especially, I wish to thank my advisor Dr. Robert Shipley for his direction and advice throughout the research and the writing of the thesis.

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To my family, Mom, Dad, Shay and Kaley, a thank you for the love and constant support. Especially to my parents for donating to me Elliot the 1996 Tercel, after the untimely demise of Emmitt the 1993 Tercel. Both have carried me from Waterloo and back home to Ottawa too many times.

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List of Key Definitions and Acronyms

Climate: The long-term average of weather at certain locations (Scott and Jones, 2006a).

Climate Change: Refers to any change in climate over time, whether due to natural variability or as a result of human activity (IPCC, 2007, Contribution of working group I).

Global Warming: Rapid changes to climatic systems intensified by the build-up of greenhouse gases caused by human activities (IPCC, 2007, Contribution of working group I).

Leisure: A measure of time: It is time remaining after work, sleep and necessary personal and household chores are completed. Discretionary time (Wall and Mathieson, 2006, 8).

Recreation: Embraces a range of activities that take place during leisure (Wall and Mathieson, 2006, 8).

Tourism: The temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations, and the facilities created and services provided to cater to their needs (Wall and Mathieson, 2006, 1). Tourism is comprised of both resident and non-resident trips and their related expenditures (Government of Newfoundland and Labrador, 2009).

Weather: The short-term (hourly to daily) conditions of the atmosphere (IPCC, 2007, Contribution of working group I).

GCM: General Circulation Model/Global Climate Model

IPCC: Intergovernmental Panel on Climate Change

LARS-WG: Long Ashton Research Station Weather Generator

NL: Newfoundland and Labrador

PCIC: Pacific Climate Impacts Consortium

SRES: Special Report on Emissions Scenarios

CHAPTER ONE: INTRODUCTION

1.1 Background

The purpose of this thesis is to examine and assess the impact that climate change may have on the tourism industry of Newfoundland and Labrador, specifically that of western Newfoundland and to consider policies and practices by which that impact may be managed. The research, therefore, will examine three major topics: Newfoundland and Labrador, tourism, and climate change.

1.1.1 Newfoundland and Labrador

Newfoundland and Labrador is the most eastern Canadian province. It is also the youngest, having joined the Confederation in 1949. Newfoundland is an island measuring 111,390 km^2. Fishing was Newfoundland's major industry from the 1500s until the late 19^{th} century and has become ingrained in the Newfoundland identity (Rowe, 1980). As of 1992, there has been a federally imposed moratorium on all forms of groundfishing, which includes cod, the major catch of Newfoundland. This has forced an economic restructuring on the province. Newfoundland and Labrador also has a declining population, an aging population, and high unemployment rates.

Newfoundland and Labrador has for years tried to expand the tourism industry to help fill the void left by the collapse of the fisheries. Over the past decade, a great deal of progress has been made in marketing and attracting visitors. This industry is expected to help fill the economic gap left by the closure of the fisheries, without disrupting the

unique culture of Newfoundland and Labrador. In 2008, the tourism industry recorded 480,100 non-resident visits, which accounted for 369.3 million dollars spent in the province. Furthermore, this industry supported 12,730 direct jobs as of this year (Uncommon Potential, 2009). Although most tourism is focused in and around the eastern capital of St. John's, the western region is also a tourism hub and uses its rugged geography and scenery to attract visitors. The western region, with its array of recreational products is a practical site for the study of tourism in Newfoundland.

1.1.2 Tourism

Tourism is one of the World's largest industries. In 2008, there were 924 million international tourist arrivals (Government of Newfoundland and Labrador, 2008; United Nations World Tourism Organization website, 2009). With such a large base, it is not surprising that Newfoundland and Labrador has sought to expand their share of the global tourism market over the past decade. In addition to this, tourism is often deemed an attractive economic generator because it is thought of as a "smokeless industry," as it provides employment and revenue without attracting large manufacturing and traditional industries. Nevertheless, it is not a perfect industry and recent research has focused on the negative impacts, such as the social implications of tourism and the potential conflicts between visitors and locals (Reid, 2003). Tourism is also highly competitive, with a high number of both destinations and travelers. Tourism planners must, therefore, be proactive to protect their tourism base.

Weather and climate have a major impact on tourism. This relationship can be as simple as the annual seasonal pattern affecting when people choose to travel. This

seasonality can also influence the type of tourists attracted and activities destinations are able to offer (Bar-On, 1975; Scott and Jones, 2006a). Compounding the effects of weather and climate is the phenomenon of climate change. Climate change has been identified in the literature as a phenomenon with the power to alter tourism patterns. Because tourism and climate are closely linked, a changing climate may alter an area's ability to draw in visitors.

1.1.3 Climate Change

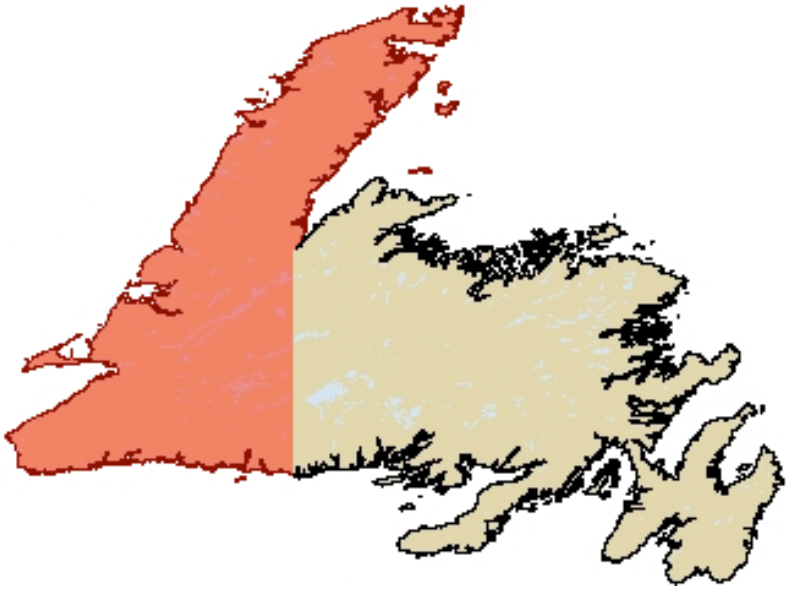
Climate change is a normal part of the Earth's natural warming and cooling cycles over centuries. Global warming is a more recent phenomenon characterized by rapidly rising temperatures caused by anthropogenic forces. Human activities, like the burning of fossil fuels, have helped accelerate the greenhouse effect, warming the planet. With this warming comes potential impacts on human systems. Tourism has been identified as one of these systems that faces changes due to global warming (Scott and Jones, 2006; Vasseur, L., & Catto, N., 2008; May and Caron, 2009).

However, the impact of climate change will not be the same for all tourism sectors and regions. As with most forms of change, there will be winners and losers. Assessments and projections can be created focusing on specific places, in order to plan for the forthcoming changes. Careful planning is required at this stage and can be aided by these impact assessments. This will allow a tourism industry to minimize the negative impacts and maximize the positive changes.

1.2 Scope and Audience

The geographical focus of this thesis is western Newfoundland. This area is defined from Port aux Basques at its southwestern point to L'Anse aux Meadows at its northeastern point (see Figure 1.1). This region encompasses a variety of tourism sites, including Gros Morne National Park and Marble Mountain Ski Resort, as well as the urban centers of Deer Lake and Corner Brook.

Figure 1.1 Western Newfoundland



This study will examine the tourism industry of this area and the potential impact climate change may have on it. Broader tourism planning themes as well as climate change impact assessments will also be examined. The audience of this thesis is all those involved in Newfoundland and Labrador tourism and especially those with the political or administrative power to make changes in policy and procedure. This thesis will

especially be of interest to tourism operators who use Newfoundland and Labrador's natural attributes as tourist products. This study may also be of interest to recreation officials and policy planners.

1.3 Literature and Justification

An examination of the literature dealing with Newfoundland and Labrador and with the literature dealing with tourism and climate change reveals that little research exists where these topics overlap. Despite the fascinating history of Newfoundland and Labrador, which is told through the works of Rowe (1980), Kurlansky (1997), and Sider (2003), there is little literature on tourism in Newfoundland. Overton (1972, 1980, 2007) and Snyder (1980), are among the few researchers that have examined tourism in Newfoundland and Labrador.

A lack of research regarding tourism in Newfoundland and Labrador mirrors tourism literature in general. Tourism is a major international industry that is growing rapidly. Still its academic literature, though substantial, allows room for further additions (Nelson, Butler, and Wall, 1993; Reid, 2003; Ryan, 2003). The relationship between climate change and tourism emerged in the 1980s and is still a topic that requires more research (Scott, Jones, and McBoyle, 2004). This research bridges all three topics and so will help to close certain gaps in the literature.

1.4 Research Questions and Objectives

The question that this thesis is seeking to answer is: what are the potential impacts of climate change on the tourism industry of western Newfoundland? Several objectives have been developed to help answer this question. These objectives are:

1) To understand the direction of the tourism industry in western Newfoundland.

2) To create projections of a probable range of change in the climate of western Newfoundland.

3) To integrate the policy direction and climate projection with the intention of highlighting opportunities and threats.

In order to achieve these objectives, a mixed methods approach is used. This is realized through the following:

1a) A series of interviews with people involved in the tourism industry of Newfoundland and Labrador.

1b) A review of tourism industry and Newfoundland and Labrador Provincial Government documents.

2a) A climatic weather generator that projects future synthetic weather for western Newfoundland.

2b) Two linear regression models that measure the projected change in climate on two tourism industries, golf and skiing.

3) An incorporation of the results of these methods in the final analysis.

1.5 Organization

This thesis will be divided into 5 chapters. Chapter One has introduced the topic and provided the research question and objectives. Chapter Two will review the pertinent literature. Chapter Three will explain the methods used to answer the research question. Chapter Four will present the qualitative and quantitative findings. Chapter 5 will analyze the findings and synthesize their results. Recommendations and areas of further research will be discussed in this final chapter.

CHAPTER 2: REVIEW OF THE LITERATURE

2.0 Review of the Literature

The literature review is divided into the three major topics of this thesis: Newfoundland, Tourism, and Climate Change. An additional fourth section deals with gaps that have been identified in the literature. The sections are further subdivided for clarity.

2.1 Newfoundland

Information about Newfoundland will be provided in the following section. This will help to establish the framework and context within which this study exists by highlighting key issues. The interchanging use of the terms "Newfoundland" and "Newfoundland and Labrador" will be avoided when possible. Historically the island itself has been known as Newfoundland, while the continental addition of Labrador did not take place until 1927 (Rowe, 1980). Today the island itself is referred to as Newfoundland but the province as a whole is officially called Newfoundland and Labrador.

2.1.1 History

Gunn (2002) regards history as essential to tourism development. He believes it is an important element in the design of place making. Furthermore, history is crucial in

retaining the physical and psychological essence of a place. Ashworth (2005) also notes the importance of history. He argues that history becomes heritage and that through heritage identity is created. Exploring the history of Newfoundland, beyond the history of its tourism industry, is thus essential for two reasons. First, it allows for a brief exploration of the development of the unique culture that is now part of the tourism product. Secondly, it provides background for the changes that forced the development of the tourism industry.

Early History

Newfoundland holds the distinction of being the first European point of contact in North American, with Viking settlement in the region over 1000 years ago (Fagan, 2007). Five centuries would pass before the famous navigator John Cabot would rediscover Newfoundland and claim it for the Crown of England (Rowe, 1980; Herman, 2004). The impact of fishing on the colonization of North America is well documented. Present-day scholars speculate that Cabot's voyage was guided by the knowledge of European fishermen, who knew of the fish-rich Grand Banks off the coast of Newfoundland (Kurlansky, 1998; Fagan, 2007). Fishing, trading, rum running and even piracy are part of Newfoundland's dramatic history (Cordingly, 1996).

Despite the myriad of characters and diversity of events in Newfoundland's history, the identity of Newfoundland is synonymous with fishing (Ruddock, 1966; Kurlansky, 1997). There is good reason for this, as the English, the French, the Portuguese, and the Spanish Basque fishing industries were already well established off the shores of Newfoundland as early as 1600 (Pope, 1995). In its 500-year history, the

Atlantic cod fishery off Newfoundland became one of the world's largest and most productive fisheries. This rich resource attracted fishermen of European descent who, during the 19th century, settled along the coastline of the island of Newfoundland in small villages (Power, 2005). These settlements began as cookhouses, storage sheds, drying areas, and other temporary building when fishing voyages were initially seasonal to avoid the harsh winter. Eventually, and usually to secure the best fishing grounds, fishermen began wintering in Newfoundland (Rowe, 1980). Because the settlements were based on fishing, access to the ocean was paramount. Little consideration was given to connecting these outports to one another by land. This would later lead to a monumental restructuring of the Newfoundland culture and society.

It was the codfish that attracted European fishermen and enticed them to weather the winter through. While a great variety of ground fish were among the hauls of fishermen, it was northern cod that was the most profitable. It accounted for upwards of 70% of catches, creating a dependency on this fish that increased through Newfoundland's history (Hutchings, 1995). By the mid-1600s, Newfoundland traded fish to the growing New England colonies for goods not manufactured in Newfoundland. The fish of lower quality was shipped from New England to the West Indies to feed slaves in exchange for rum and molasses (Rowe, 1980). Fish remained the raison d'être of Newfoundland for centuries and supported its growth. The rich cod stocks first began to show signs of over-exploitation in the mid-1800s and fishing shortages became a recurring crisis from then onwards (Hutchings, 1995).

Newfoundland remained a temporarily base for fishermen to inhabit until the English parliament passed the Newfoundland Act in 1699. Newfoundland was not

recognized as a colony, but rather as an extension of the British Isles. While officially there were few permanent settlers, growing numbers of Irish immigrants came to populate the island. This led to issues of social division. The island's social unrest, due in part to its lack of any legal or societal structure, was largely ignored by England, in the hope to avoid settlement knowing that the cost of the implementation of services and law would fall on the British (Rowe 1980). The specter of the American Revolution had dire consequences for Newfoundland as it was prohibited to trade with the American colonies by England in 1775. This forced Newfoundland to strengthen its ties with the West Indies and with British North America. Despite this level of independence, Newfoundland was not granted Representative Government until 1824. The War of 1812 and the Napoleonic Wars proved beneficial to Newfoundland as the price of cod reached new heights, attracting thousands of new immigrants, the majority of them from England and Ireland. During this same period however, the cod fishery faltered and American privateers harassed fishing and trading vessels. Not until 1832, when Newfoundland boasted over 60,000 inhabitants was it granted the status of colony by Britain (Rowe, 1980).

Political turbulence followed Newfoundland's first election in 1832. Despite this, a great deal of development took place in the form of new schools, roads, shipping, postal services, and centralized water supplies. Still the local government had yet to resolve the problem of total dependency on the single industry of fishing, which in addition to making the Newfoundland economy vulnerable, also created seasonal unemployment. The 1861 election provided some stability in Newfoundland. A copper mine opened in 1864 with several other mining operations following. A series of natural disasters during the 1860s reinforced the need for an economic diversification and Newfoundland's

natural resources of land, minerals, and forest were seen as areas of potential. In 1881, construction on the Newfoundland railway began. It had long been hailed as the only way to open up the interior and the untold wealth of the natural resources there. Full operation began in 1900. At this time, a paper mill and an iron mine opened, creating hundreds of jobs. The logging industry proved a good complement to fishing because as one season opened the other closed. Despite these new advancements and sources of employment, Newfoundland remained poor (Rowe, 1980).

In 1914, when Britain became involved in World War I, Newfoundland offered support. Many young men joined the Royal Navy out of obligation to the Crown and for the regular pay it offered. The Newfoundland Regiment, largely made up of volunteers, left Newfoundland within weeks of the declaration of war and was assigned to the British army. July 1, 1916, a battalion of approximately 1000 Newfoundlanders was sent against German lines in Northern France. The results of this, known as the Beaumont Hamel engagement, with 720 casualties were disastrous. By the end of the war, Newfoundland had lost hundreds of young soldiers, needed to care for those who returned wounded and its debt had increased (Rowe, 1980). In 1918, Newfoundland officially adopted the title of Dominion, although it had essentially held that status since 1907 (O'Brien, 2007).

The paper mill that opened in Corner Brook following the war, led to the wider development of western Newfoundland. Deer Lake was established as a satellite town to lodge those providing hydroelectricity to Corner Brook and loggers (White, 2007). By 1930, the Depression had hit and the prices dropped on Newfoundland's exports (Rowe, 1980). Britain stepped in to financially support Newfoundland on the condition that self-government was suspended. Little development or progress was made until the outbreak

of the Second World War in 1939. Newfoundland's strategic importance between North America and Britain led to an agreement to allow the United States to build three bases on the island. The subsequent construction required Newfoundland labour and resources that resulted in a brief surplus of revenue for Newfoundland by 1940. By 1942, Newfoundland was issuing loans to Britain (Walden, 2003). At the end of the war, Britain was destitute while Canada and Newfoundland enjoyed relative economic prosperity. In years following, Canada and Britain quietly discussed Newfoundland becoming a Canadian province. Meanwhile, a third option emerged as many in Newfoundland considered returning to independence. A referendum was held and Newfoundland voted for a union with Canada by a very slim margin. April 1 1949, Newfoundland and Labrador became the tenth Canadian province (Blake, 2004).

Modern History

Newfoundland's more recent history is important in describing the situation in which the tourism industry is operating. Despite the brief economic boom after the war, years of poverty and underdevelopment continued after Newfoundland and Labrador entered the Canadian federation (Overton, 1978). Regardless of the efforts to diversify the economy, dependence on the fisheries continued. The continual over-use of this industry eventually took its toll. The traditional fishery began declining by the mid-20th century and this was not the first time collapses had been recorded. This latest collapse spurred the newly formed provincial government, to once again attempt to disengage the economy from fishery resources (Mayo, 1951).

Through the 1950s and 60s, in response to this economic decline, politicians and planners were encouraging the abandonment of the fishing villages on the periphery (Seymour, 1980). Beginning in 1954, the Province of Newfoundland and Labrador began the "Centralization Program" that would move Newfoundlanders from the smaller outport communities. Sider (2003) sees two drivers behind this program. The first was to close off the smaller communities, as they were expensive to service and, in certain cases, were obstacles in the development of tourist parks. The second was to create a factory labour force. The government paid relocation assistance amounts of $150 per family in 1954, rising to $600 per family in 1965. However, the assistance was only provided if the whole community moved. This caused considerable tension within communities. In 1965, the "Household Resettlement Program" not only moved people from the outports but directed them to growth centres. Over 15,000 rural inhabitants were relocated and by the 1970s, a third of named communities (communities large enough to warrant a title) had been abandoned (Sider, 2003; Canning, 1986).

In 1979, a major oilfield, Hibernia, was discovered 315 kilometers offshore from St. John's. It is considered to be the fifth largest oil find in Canada. Two more oilfields, White Rose and Terra Nova, were subsequently discovered during the 1980s (Miller, Jr. and Hackett, 2008). The 1982 sinking of the Hibernia offshore oil rig, the *Ocean Ranger*, claimed the lives of all 84 aboard and dashed the initial optimism Newfoundland and Labrador enjoyed with their new opportunity. In 1985, Newfoundland and Labrador was able to secure a joint federal-provincial management of the offshore resources. The drilling projects continue today (Major, 2001).

The economic possibilities of the offshore oil would pale in comparison to the events that took place a few years after their drilling began, when the cod fishing industry collapsed, even more drastically than ever before. The importance of the cod to the Newfoundland and Labrador history, economy, and culture can be understood by examining the definition of "Fish" in the *Dictionary of Newfoundland English*, which simply reads: "Cod" (Story, Kirwin, and Widdowson, 1990). The cod was an integral part of every aspect of the Newfoundlander's way of life, including language. Only by understanding the significance of the cod in the Newfoundland and Labrador culture can the significance of the events of the 1990s be appreciated.

The Newfoundland fishing industry had collapsed and recovered several times during the 20th century. The social and political consequences of the economic hardships brought about by this decline and these collapses were severe, but were overcome. Yet, the most recent collapse of the cod fishery in the early 1990s, and the subsequent moratoriums declared by the Canadian Government between 1992 and 1995 that suspended many forms of inshore fishing, was the most severe. It affected upwards of 30,000 workers in Newfoundland (Power, 2005). The population of the province fell 10% during the 1990s and the decline continues (Overton, 2007; Statistics Canada, 2009). In addition to the permanent loss of inhabitants, Newfoundland and Labrador loses roughly 15,000 people a year, who temporarily leave the island searching for work (The Economist, October 13, 2007). For the province to move forward, an economic restructuring is necessary.

This historical background is important to this study because it provides the context that modern Newfoundland and Labrador exist within. Recurring themes of a too

narrow economic base, fishery collapses, and population and rural decline are evident. This study seeks to better understand the tourism industry of Newfoundland and Labrador. Understanding the past and preset needs for economic diversity and the events that led to this is crucial.

2.1.2 Demographics and Geography

Demographics

A brief demographic profile of Newfoundland and Labrador will allow for a greater understanding of the issues facing the province. It will also give greater weight to the numbers previously given regarding relocation and migration.

Table 2.1 Newfoundland and Labrador Demographic Snapshot	
Population data:	**Newfoundland and Labrador:**
Population in 2006	505,469
Population in 2001	512,930
2001 to 2006 population change (%)	-1.5
Population density per square kilometer	1.4
Land area (square km)	370,494. 89
Median age of the population	41.7
Employment rate (%)	47.9
Unemployment rate (%)	18.6
Source: Statistics Canada, Community Profiles, www.statscan,ca, retrieved March 28, 2009.	

This snapshot from Stats Canada indicates that Newfoundland and Labrador has a population that is in decline and is older than the Canadian average of 39.5. In addition to this, unemployment is approximately triple the national average of 6.6%. These employment numbers refer to those in the labour force, which is 15 years and older and excludes institutionalized residents (Statistics Canada, Community Profiles, www.statscan,ca, retrieved March 28, 2009). The Newfoundland and Labrador Statistics

Agency reports a Personal Income (per capita, 2008) of $30,504 (www.stats.gov.nl.ca, retrieved March 28, 2009). Obviously job creation is of major concern to the provincial government and its people. These numbers help to identify why tourism has been pushed as a viable industry in Newfoundland and Labrador: not only can it help to create employment, but it can employ older personnel.

Figure 2.1 NL Potential Market Shift

Source: Regional Demographic Profiles: Newfoundland and Labrador, 2007

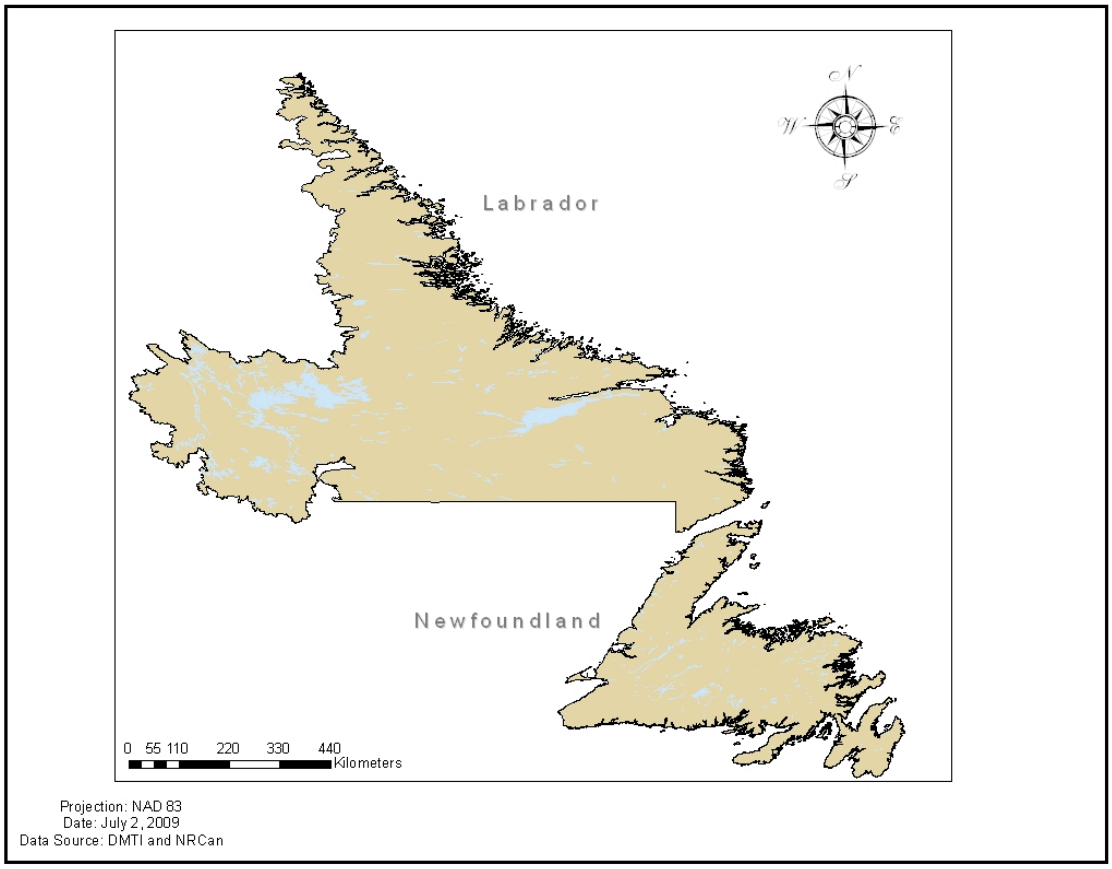
It is important to emphasize that age demographics make the tourism industry more appealing as an area of potential in Newfoundland and Labrador. As the graph above (figure 2.1) indicates, not only is the population of Newfoundland and Labrador aging, but also the 15-24 age group, those entering the workforce, is shrinking. This decline is partly because Newfoundland and Labrador has the lowest fertility rate in Canada, but also due to high levels of out-migration (Regional Demographic Profiles:

Newfoundland and Labrador, 2007). As previously mentioned, tourism is an industry that can re-train workers and utilize an older workforce.

Geography

Newfoundland is an island at the eastern extreme of Canada, which falls between the parallels of latitude 46º north and 52º north. Labrador, the province's mainland component, is located to the northwest of the island and borders Quebec (Rowe, 1980). Newfoundland and Labrador has a rugged terrain and a diverse topography (see Figure 2.2 below).

Figure 2.2 Map of Newfoundland and Labrador



The island itself is essentially a tilted plateau, with the west sitting higher than the east. In Labrador, the highest elevations occur in the north and there are significant highlands

throughout. The climate of Labrador is Artic in the north, while the interior has a continental climate of cold dry winters and warm summers. Newfoundland, because of the meeting of the warm Gulf Stream waters and cold ex-Artic waters merging off its eastern shores, has cool summers and mild winters. Newfoundland records more annual precipitation than Labrador and, in Canada, is second only to coastal British Columbia in this category. Snowfall is highest in the interior of Labrador, 475 cm annually, and lowest at the southeast of Newfoundland, 150 cm annually. Labrador and, especially, Newfoundland have a significant number of lakes, rivers and waterways. These are important for providing energy, as well as potential for recreation. Camping, cottaging, rafting, and boating are all compatible uses (Water Resources Atlas of Newfoundland, 1992).

Despite Newfoundland's varied geography, a Department of Forestry and Agriculture land inventory listed only four categories for compatible land uses on the island of Newfoundland. These were, forestry, recreation, ungulate (moose and caribou) grazing, and agriculture. Agriculture was deemed the least suitable for the region, mostly because of a limited growing season and lack of soil. Less than 8% of the land was deemed suitable for agriculture and over half of this was of low potential. The few crops that are able to grow in Newfoundland and Labrador are potatoes, turnips, and cabbages as well as some pasture crops. Some small fruits, such as blueberries, do well depending on the early of late frosts. Forestry shows compatibility as over 9.5 million acres were deemed productive or potentially productive forestlands. Recreation was considered a very compatible land use. Outdoor recreation could take advantage of the salmon rivers, coastlines, shorelines, waterfalls, wildlife colonies, ski slopes, and viewpoints. The

island's ungulate population is very sustainable. The main staples of a moose's diet are widely available. The caribou wintering grounds are critical and therefore need protection from development. The priorities for protection of these lands were rated from highest to lowest as: agriculture, recreation, forestry, and ungulates (Newfoundland. Lands and Surveys Division, 1974). The high compatibility for recreational purposes, which would include tourism, is important.

Newfoundland's dispersed settlements and low population density are a legacy of its fishing history. Despite the relocation efforts during the 1960s and 1970s, Newfoundland and Labrador's population remains very dispersed. This makes servicing areas expensive and infrastructure and transport facilities are in need of repair (Overton, 2007). However, these same attributes are used as tourism products. Open spaces, outdoors recreation, and remote fishing villages are part of the tourism package offered by Newfoundland and Labrador.

2.1.3 Government

Newfoundland and Labrador is a Canadian province. As such, it has a certain degree of self-government and is responsible for all local and regional needs. It has its own courts, laws, and tax base. Like all Canadian provinces, Newfoundland and Labrador follow the parliamentary mode of 'First Minster' government. One of the biggest issues for Newfoundland and Labrador's provincial government has been fiscal equalization, which are payments made to provincial governments whose revenue falls below a threshold outlined by the federal and provincial governments. An equally important issue

is control over natural resources (Bakvis and Skogstad, 2007; Archer, et al., 2002; Brooks, 2000).

The Newfoundland and Labrador provincial government consists of 16 Departments, one of which is Tourism, Culture, and Recreation (TCR). The Department of TCR defines its mandate along four lines of business. These are: Recreation and Sport, which includes active living and community-based sport organizations; Tourism Marketing, which includes marketing Newfoundland and Labrador as a national and international tourist destination; Strategic Tourism Product Development, which includes developing regional and outdoor tourism products and maintaining a professional industry; and Cultural Heritage, which seeks to preserve and promote the heritage of the province in support of the tourism industry. The Department of TCR states that tourism is both an area of growth and potential in the province. It sees tourism creating economic benefits, protecting natural and cultural heritage and regenerating communities (Newfoundland and Labrador tourism website, http://www.newfoundlandlabrador.com/TravelTrade/Default.aspx. Retrieved December 1, 2007).

Marble Mountain ski resort, located 10 kilometers east of Corner Brook and 40 kilometers west of Deer Lake on Newfoundland's western coast is a particular site in this thesis and requires mention in this section because it is a government entity. It is 1 of the 85 Crown Corporations and, as such, a Category 2 government agency. Crown Corporations are "distinct legal entities in which the government holds ownership and control on behalf of the Province. As a result government generally appoints the members of the board of directors, provides direction in the area of policy and, where necessary,

provides operating funds to permit the agency to carry out its mandate" (Office of the Auditor General, 2001, 59). Funding has been an area of major importance for Marble Mountain.

The provincial government developed Marble Mountain for recreational purposes through the 1960s and 1970s. The ski resort was expected to act as a catalyst for tourism development in the area (Davis, 1990). In 1988, the Marble Mountain Development Corporation was incorporated and is currently 100% provincially owned. From its incorporation until 2002, its most recent audit, Marble Mountain had received $37.1 million in provincial and federal funding (Office of the Auditor General, 2002).

2.1.4 Economy

Newfoundland's economy has been based on the fisheries since its settlement. Due to the vulnerability this dependency created, several attempts to diversify have been made, but few have succeeded (Schrank, 2005). After the 1992 moratorium on groundfishing, diversification was forced upon Newfoundland and Labrador. The tourism sector was expected to be an industry that could help fill the void left by the decline of the fisheries (Overton, 2007). Nevertheless, it is still largely the finite industries of resource extraction that dominate the Newfoundland and Labrador economy.

An examination of an economic review of the province reveals how the impact of the fishing industry has changed and shows the impact the tourism industry is making. According to The *Economy 2009: Building on our Strong Foundation* (Government of Newfoundland and Labrador, 2008), the goods-producing sector accounts for 58.8% of the Gross Domestic Product with the services-producing accounting for 41.2%. Fishing,

hunting and trapping, contribute only 0.8% of the GDP but did provide 3.0% of the 2008 employment total. The largest industries in terms of GDP are oil extraction (36.2%), mining (11.7%), and finance, insurance, real estate and business support service (9.9%). The largest sources of employment are retail trade (14.2%), health care and social assistance (14.8%), and public administration (8.4%). Combining the sectors of information, culture and recreation (3.8%) and accommodation and food services (6.0%) gives an approximation of the tourism contribution to employment (9.8%). From these numbers, it can be seen that the fisheries are no longer the main economic driver of Newfoundland and Labrador. Furthermore, it can be seen that tourism provides a significant percentage of employment in the province, even if its impact on the GDP is minimal (3.7%). Newfoundland and Labrador have clearly shifted away from their traditional sources of income, fishing and hunting, to other natural resources. Natural resources were highlighted as an area of economic potential over a century past, in the 1860s, demonstrating the slow desire to shift economies (Rowe, 1980).

The information presented in this section has provided a historical, geographic, and economic context for this thesis. It has also attempted to highlight the economic problems and the ongoing transition from a primary-based economy to a service-based economy. This allows a better understanding of why tourism was decided upon as an area of potential and development. The following will focus on tourism in general and in Newfoundland and Labrador.

2.2 Tourism

This section will focus on tourism in general and on Newfoundland and Labrador in particular. It will explore provide theories surrounding tourism planning.

2.2.1 Tourism

The Newfoundland and Labrador Department of Tourism, Culture and Recreation define tourism as "comprised of both resident and non-resident trips and their related expenditures" (Government of Newfoundland and Labrador, 2009). While this definition will be the authoritative version used in this thesis, an inclusion of some academic definitions is useful. One such working definition of tourism is "the temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations, and the facilities created and services provided to cater to their needs" (Wall and Mathieson, 2006, 1). While many of the earlier definitions of tourism focused on the economics, current analyses are incorporating numerous disciplines and a broader scope. One of the basic elements of tourism is supply and demand. Demand includes the diverse range of interests of the traveler. Supply includes the physical and institutional products needed to serve travelers (Gunn, 2003). This is the underpinning of tourism, an industry that has become an area of increasing importance in many rural areas because it is a large economic generator.

Tourism is a major international industry. According to the United Nations World Tourism Organization (www.unwto.org, 2009), international tourist arrivals grew by 2% in 2008, reaching 924 million, which is a 16 million increase over 2007. In 2007, $856 billion (US) was generated by international tourism, which equates to 30% of the world's

exports of services. Should it reach its potential, the employment and economic opportunities for Newfoundland and Labrador would be substantial in such an industry.

A proper research project focusing on the tourism industry in Newfoundland and Labrador must begin with a consideration of tourism planning concepts. Gunn (2003) clarifies the basic fundamentals. He notes the necessity of planning in tourism in order for the industry to reach a greater level of efficiency. The interdisciplinary nature of tourism requires it be regarded as a system and that issues of growth, sustainability, and the environment be taken into account. He notes the double-edge of tourism as an industry that can allow communities to seek the economic benefits of foreign visitors or can lead to the loss of culture through commercialization to attract these visitors (Gunn, 2003).

Another tourism theorist, Hall (2000) argues that sustainability needs to become a greater component of the tourism literature. Sustainability, the author contends, is more than an ecological term, as it encompasses the economic, social, political, and physical systems that tourism is a part of. He also writes on the importance of theory and the need for it to remain rich, in order to be relevant to practice. This work also notes the often-overlooked importance of planning in tourism theory.

In line with Hall's (2000) study of tourism and sustainability is the work of Nelson, Butler, and Wall (1993). Their work outlines many useful concepts and theories. The authors see sustainability as both the continuation of natural resources and production as well as the balance of culture and of the enhancement of the quality of life. Their section on ecotourism and tourism through wildlife and natural settings in Canada

is useful in studying Newfoundland and Labrador's marketable features. The authors note the importance of local-level involvement in any successful tourism industry.

One of the growing sectors within tourism is cultural heritage tourism. It is defined as, "travel concerned with experiencing the visual and performing arts, heritage buildings, areas, landscapes, and special lifestyles, values, traditions and events" (Jamieson, 1998, 85). This definition encompasses many areas and gives tourism a wider market. In making the transfer from heritage resource to marketable resource, many risks are encountered. Commercializing these areas of cultural value can compromise their authenticity (Jamieson, 1998). While this type of tourism is not the focus of this thesis, it is a major component of the Newfoundland and Labrador tourism industry and therefore some preliminary research into it was necessary.

Practical theories within the tourism literature are put forward by Page (1994), concerning transport, and Stevens, (1989) regarding visitor satisfaction. Page (1994) addresses transportation theory as it applies to tourism. He notes that transport is the essential link that connects tourists to their destinations. Page (1994) comments that as transportation technology has advanced it has increased the connectivity between travelers and their destinations. Stevens (1989) argues that leisure studies have neglected serious exploration of the role of the customer in their research. In a market-oriented industry, like tourism, customer care should be paramount. Interpretation is also crucial in presenting heritage and history as products of tourism. Predicting the wants of visitors and reacting to their needs is necessary in this competitive industry (Stevens, 1989).

Moving away from the nuts and bolts of tourism planning, there are those theorists who believe that the growth of the tourism industry is not always seen as a

positive force. Donald Reid (2003) critiques the current practice of tourism development. While acknowledging that the dynamic force of tourism is typically promoted as a means of economic development for areas that have lost their traditional, and often primary, industries, Reid warns against the capitalistic nature of tourism and the negative implications it can have at the community level. Similar to the work of Hall (2000) and that of Nelson, Butler, and Wall (1993), Reid sees environmental and social sustainability as the key to successful tourism development. In order for this sustainable tourism to exist, it must be carefully planned for and managed. To achieve this, the planning approach needs to move away from producing a product and instead focus on the process of tourism development (Reid, 2003).

2.2.2 Tourism in Newfoundland

Tourism was looked to as an area that could help fill the economic void left by the early 1990s ground-fishing moratorium. The rich and diverse history of the region coupled with its spacious rugged geography, could be used in creating and promoting tourist destinations. For example, the work of Overton (2007) explores the attempted exploitation of Newfoundland's storied history through tourism sites based on Viking settlements and archeological sites. Because tourism is often seen as a non-invasive industry, it was believed a shift in the economy could be achieved while retaining the culture of Newfoundland. This is not a solution specific to Newfoundland and Labrador and can be seen elsewhere in the new global economy. When traditional industries collapse, tourism is often touted as a viable option (Reid, 2003). Without fishing, the Newfoundland outports that had not been abandoned during the 1960s relocation again

faced the possibility of ceasing to exist. This fear drove the economic shift towards tourism in the belief that it could save Newfoundland and Labrador's culture and economy (Overton, 2007). In 1994, Newfoundland and Labrador released a vision statement (Gunn) identifying tourism as an area of potential investment. Much private and public investment was seen over the following years. Despite the growth and development of the tourism industry in Newfoundland, doubts remain as to its ability to provide a new economic base for rural outports (Overton, 2007; Ashworth, 2005).

Surprisingly, tourism in Newfoundland has a long history, dating back to the late 1800s, when wealthy hunters were lured to the area by the promise of an untouched wilderness (Seymour, 1980). In the past, Newfoundland marketed itself to Canada and the United States as an escape from the summer heat and the pollution of the cities. When the Newfoundland Tourism and Publicity Association was formed in 1925, it believed its tourism products of scenic beauty, history, and pleasantly temperate climate would attract visitors (Seymour, 1980). After Confederation, Newfoundland marketed itself to the middle-class, who in the post-WWII years had become more likely tourists. Interestingly, this 1980 Seymour paper was written to demonstrate how the efforts of tourism promotion in the late 1970s, of nature, history, and climate, had changed little from the efforts of the 1890s. Even in 2009, it can be seen that very little has changed.

The need for proper tourism planning and management can be seen in Newfoundland's earliest tourism attempts. At the turn of the 20th century, Newfoundland's tourism market consisted of rich foreigners looking for big game hunting (Overton, 1980; Seymour 1980). Native caribou, an important source of food for poor settlers, was transformed into a tourism resource. To protect it as such, nearly all

forms of killing caribou were made illegal, save hunting for sport. The combined difficulty in preventing local hunting of caribou and promoting sport hunting resulted in a rapid decline in the caribou numbers by the 1920s. While the government had hoped that the fees levied on foreign hunters would contribute to the provincial economy, this profit of the tourism industry came at the expense of local residents (Overton, 1980). This anecdote is very telling and is applicable to the impacts of tourism in a much broader sense: if poorly planned and managed, tourism can be just as unhelpful and destructive as any industry.

Moreover, the difficulty with providing a tourism experience without making it inauthentic, as destroying the caribou herds did, is also an issue with transforming rural outports into tourism destinations. The romanticism associated with these remote fishing villages is based in the fact that they are accessible only by boat. Creating roads and infrastructure to allow tourists to experience these places destroys the very thing that makes them special (Ashworth, 2005). Tourism planning and forward thinking are necessary in finding a proper balance.

In some ways, the current thrust of Newfoundland and Labrador's tourism industry is very similar to its previous cultural tourism efforts. Fishing and small and large game hunting are still attractions and are promoted on the Newfoundland and Labrador tourism website (http://www.newfoundlandlabrador.com/TravelTrade/Default.aspx, 2009). With the island being more accessible and travel cheaper, in comparison to the early 20th century, the management of these natural resources becomes more difficult. A stability needs to be found, both in the commoditization of natural resources for tourism and in the avoidance

of any disruption of community integration. These are two crucial elements of tourism planning. This balance is made all the more precarious by the failures of the past, as illustrated by the caribou example.

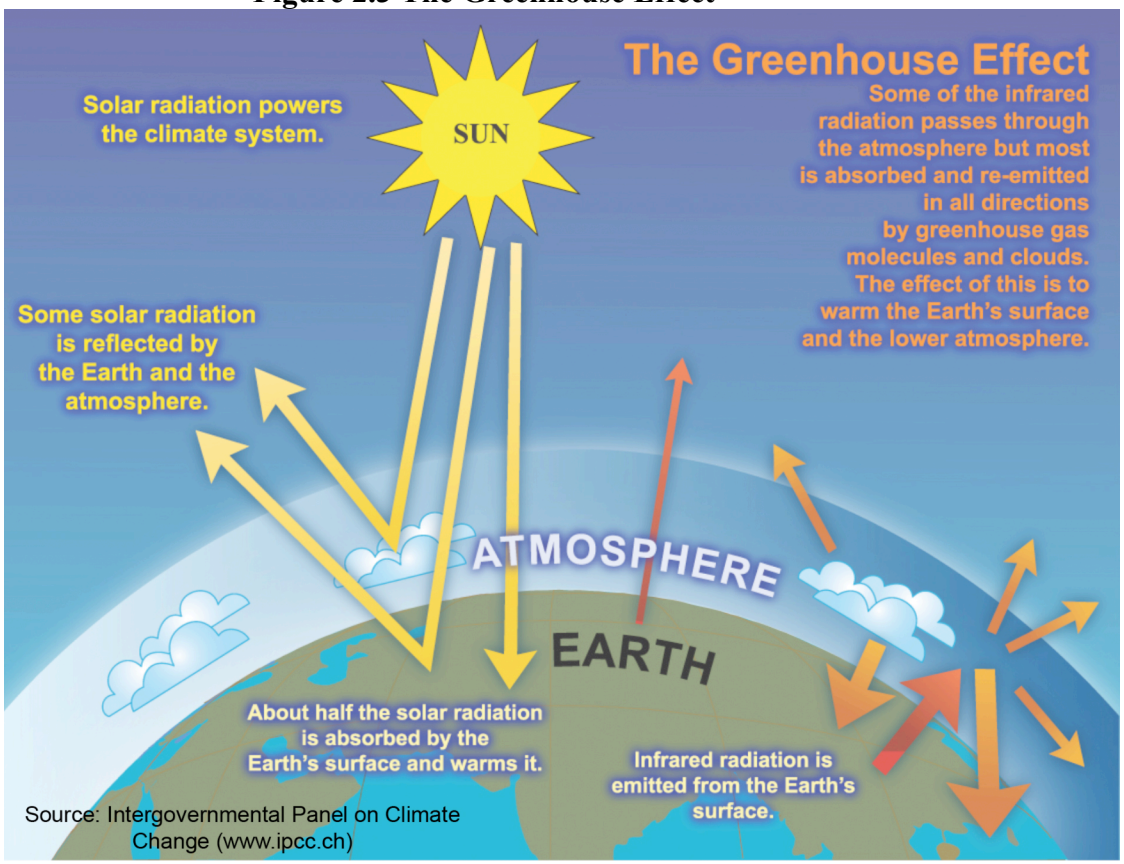
2.3 Climate Change

This section will look at climate change. First the scientific basics will be presented in general and then as they relate to Newfoundland and Labrador. Next, the relationship between climate and tourism will be explored. Finally, the impact of climate change on that tourism-climate relationship will be explored.

2.3.1 Climate Change

The science behind climate change is complex but a basic understanding of it is relevant to this study. Climate change is a natural phenomenon, as the Earth has experienced numerous climates in its history. However, climate change has become an area of increasing attention lately, because the planet is seeing warming at a rapid pace. There are a variety of causes of global warming including, greenhouse gas emissions, cloud cover, long-term climate trends, and solar cycles. Anthropogenic causes of global warming are due to the increase of greenhouse gas emissions released from the burning of fossil fuels, aerosols, and deforestation. This is important because Global Climate Models use potential storylines based on a variety of emissions scenarios. The following figure provides a visual explanation of the greenhouse effect.

Figure 2.3 The Greenhouse Effect



The possible outcomes of this rapid warming include increased frequency of natural disasters, melting ice caps, rising sea levels, altered snow seasons, and changes in precipitation and temperature. These changes will have unknown consequences for a variety of natural and human systems. Ecosystems, plant species, biodiversity, and animals will all react differently to the warming climate. Some will be threatened by the change (May and Caron, 2009; Schneider, 2008).

The Intergovernmental Panel on Climate Change (IPCC), a United Nations organization, has released a number of reports on climate change and its implications. The most recent, *IPCC Fourth Assessment Report* (AR4) was released in 2007 and is divided up into three group reports. Working Group I is titled, *The Physical Science*

Basis. Working Group II and III are titled *Impacts, Adaptation and Vulnerability* and *Mitigation of Climate Change*, respectively. As the IPCC and AR4 make up the most current and authoritative work in this field, the following will present some of the findings relevant to this thesis.

Working Group I's report (Working Group I, IPCC, 2007) deals with the scientific basis of climate change. Presently, changes in global atmospheric concentrations have altered the balance of the climate system. The most important anthropogenic greenhouse gas is carbon dioxide, which has vastly increased (36%) from pre-industrial levels. The use of fossil fuels is the biggest driver in the emission of carbon dioxide. A lesser emitter is land-use change. Sea-level rise is expected as the ice sheets in Greenland and Antarctica melt and as warming seawater expands. Droughts and heat waves are expected to increase. Working Group I concludes that it is "very likely" that the observed increase in global average temperatures is a result of human activity resulting in an increase in greenhouse gas emissions. They also conclude that it is "very unlikely," meaning greater than 90%, the changes in climate from 1950s onwards were due to natural variability. The findings of this report, including the fact that anthropogenic causes are implicated in global warming, are important in tourism studies. This is because climate and tourism are linked in two ways: the impacts that climate change will have on tourism (i.e. altering weather patterns of destinations) and the greenhouse gas emissions created by tourist travel (Amelung, B., Nicholls, S., & Viner, D., 2007; Becken and Hay, 2007; Martín, M. B. G., 2008).

The contribution of Working Group II (Working Group II, IPCC, 2007) assesses global impacts, adaptations, and vulnerabilities to climate change. The authors lament a

lack of geographical balance in the climate data as certain regions are underrepresented. They conclude that warming temperatures are impacting natural systems, such as ice and snow, hydrological systems, and biological systems. Some of the consequences of this include shifts in ranges and changes in algae, plankton, and fish numbers in high-latitude oceans. Findings are also presented indicating that human environments and systems are being affected by the changing climate. It is expected that ecosystems will collapse as they are overwhelmed by the rapid increase in temperature. Coastal regions and communities are to be exposed to the risks of erosion and sea-level rise. While parts of North America may experience gains in the short-term in certain sectors (i.e. agriculture) the long-term effects are projected to be detrimental. Human systems may be affected as well as increased heat waves will affect the elderly. Natural resources, fisheries, and tourism destinations are expected to deteriorate with coastal erosion. Consideration of sustainable development and methods of adaptation are recommended, especially in land-use planning and infrastructure design.

The third document from the IPCC (Working Group III, 2007) deals with mitigating the negative effects of climate change. Emissions trends are examined and emission scenarios are examined with and without mitigation. The two emissions scenarios used in this thesis, and their storylines, will be examined. A variety of storylines are created by the IPCC as plausible future scenarios that are, in turn, used as a basis for Global Climate Models/General Circulation Models (GCMs) to create their projections on. Details on GCMs and on the storylines used by the GCMs in this thesis will be examined in the following. In the B1 storyline, the Earth's population peaks in the mid-century and declines thereafter. The global economy shifts towards a service

orientation. New clean technologies are introduced in this storyline. The A1 storyline describes a world of rapid growth, economically and in global population. More specifically A1B, used in this thesis, puts a balanced emphasis on fossil and non-fossil technologies. In the short term, until 2030, there is substantial economic potential for both bottom-up and top-down reductions of greenhouse gas emissions. The report notes that no single industry or technology can mitigate climate change. All sectors, including energy, transport, buildings, industry, agriculture, forestry, and waste management, are needed. Changes in behavior and in technology form the two major streams in mitigating green house gas emissions. Carbon taxes or an emission trading scenarios are projected to lower the costs of global warming and several areas of potential for new mitigation strategies and technologies are discussed. The report concludes that the further delayed mitigation strategies are, the more costly they will be to implement. This literature on mitigation is applicable to this thesis because tourism is an industry that would also need to adapt to new technologies and mitigating methods.

Global Climate Models/General Circulation Models (GCMs) are highly sophisticated tools used by researchers and planners to determine a range of probable future climate scenarios. Though the most comprehensive explanation of GCMs is available at the United Nation's Intergovernmental Panel on Climate Change website, examining the work of other researchers is very useful (IPCC, 2009). For example, a practical understanding of how to develop climate change scenarios and interpret GCMs can be acquired from the work of Mortsch, Alden, and Klaassen (2005). Although this study specifically examines the effects of climate change on water levels between Lake Ontario and the St. Lawrence River, it describes the methods through which specific

scenarios and models were chosen. Another relevant case study is presented by Drinkwater (2005), who explores the impacts of climate change on the northern cod. The study first explains the effects of temperature on the cod, secondly creates global climate change models, and finally combines the results of the models with what is known about the cod. Conclusions and recommendations are based on the projections. He concludes that the recent decline of cod stocks is the result of a combination of impacts from fishing and climate change (Drinkwater, 2005). While this article's subject matter is auxiliary to this thesis, the conclusions are interesting and the methods are useful.

Barrow, Maxwell, and Gachon (2004) explain the importance of climate change scenarios in Canada. The authors state that the focus of climate experts has begun to shift towards studying the vulnerability of human and natural systems to climate change. Scenarios play an important role in exercises of impact assessment. In the field of strategic planning these scenarios are invaluable tools. The authors lament that there is missing data in Canada from past records that makes backdating historical climate difficult. Specific issues that have relevance to this literature review, include a section on coastal impacts in Atlantic Canada. Also, the difficulty in establishing relationships between climate change and tourism, as a multi-faceted industry, is noted. The authors believe that the issue for tourism is more complicated because of the high degree of competition and substitution, in addition to climate. The true challenge is for businesses within the industry trying to reach a profitable threshold.

GCMs are useful tools in projecting potential future scenarios. Using these projections, researchers can identify potential climate related threats and opportunities. Utilizing climate change scenarios and GCMs requires an understanding of the methods

used by other researchers. Because GCMs only provide very course resolution (covering very broad areas), temporal downscaling methods have been created to provide finer resolution, which is more useful for site-specific analysis. These downscaling models are necessary for accurate impact assessment studies (Wilby, Dawson, and Barrow, 2002). While several methods have been created for more localized results, the Long Aston Research Station Weather Generator (LARS-WG), used in this thesis, will be explored specifically. The LARS-WG is a stochastic weather generator that is used to simulate weather patterns at the site level (Racsko et al., 1991; Semenov and Barrow, 2002). A stochastic weather generator is a numerical model that produces synthetic climatic variables; for this thesis, temperature and precipitation were used. The synthetic data can be combined with GCM data in order to create climate change scenarios (Semenov and Barrow, 2002).

Though originally created to investigate the impacts of climate change on agricultural and hydrological systems, this weather generator can be used for other purposes (Semenov and Barrow, 1997; Scott, McBoyle, and Mills, 2003). The first version of the LARS-WG was created in 1990 to correct the deficiencies of existing methods in modeling the length of dry spells, which is important in assessing agricultural impacts. The current version generates synthetic weather data and has been shown to be more accurate than other downscaling models (Rocski et al., 1991; Semenov and Barrow, 2002). Using this type of model as a tool for assessing the potential impacts of climate change on tourism sites has been done in the past (Scott et al., 2002; Scott, Mills and McBoyle, 2003; Becken and Hay, 2007).

De Freitas (2005) identifies two approaches for assessing climate change impacts: the scenario approach and the sensitivity approach. The scenario approach is the most common in impact assessment studies. It is based on human inability to forecast future climate and relies on 'what if' statements. The author emphasizes that scenarios are not forecasts, but are often incorrectly treated as such. This approach is limited by the unreliability of GCMs, especially at the regional level. The implications of incorrect data at a planning level are serious. The author goes on to argue that planners and tourism operators require more climatic information than means and averages. Rather than using scenario studies in isolation, it is recommended that sensitivity assessments be performed. The author views the spatial dimensions of climate as "zones" that are not necessarily affected by climate change so much as they are geographically shifted. This would result in areas that were previously undesirable as tourism destinations becoming desirable. For the methods to be more successful, more information is required on what climate related criteria tourists use to make decisions (De Freitas, 2005).

2.3.2 Climate Change in Newfoundland

The Canadian Government recently released a document on the impacts of climate change on Newfoundland and Labrador (Government of Canada, 2006). It projects a 3-4ºC annual temperature rise for the Atlantic Provinces by the end of the century. It notes potential changes in shipping, iceberg frequency, coastal erosion, flooding, and marine ecosystems. The document however neglects to make any reference to the impacts climate change will have on the tourism industry and, therefore, indicates a gap in the literature.

In the document, *From Impacts to Adaptation: Canada in a Changing Climate 2007* (Lemmen, Warren, Lacroix, and Bush, 2008), there is a chapter on Atlantic Canada (Vasseur and Catto, 2008). Key findings concerning the impacts of climate change from the chapter include: a likely increase of flooding and severe storms, both of which are detrimental to the tourism industry; increased stress on water and fishery resources; and a need for adaptation efforts and proactive planning. Projections indicate that Newfoundland will see warmer and drier summers as well as warmer winters. The authors also note that although all the Atlantic Provinces have protected area strategies, regional planning for protecting biodiversity in the face of climate change has yet to be put into place. Coastal erosion is also an important consideration for this review as both the east and west coasts of Newfoundland have experienced accelerated degradation due to residential and tourism uses. Shifting temperatures in the ocean currents may negatively impact the fishing industry and increase the flow of icebergs along northeastern Newfoundland. These impacts to the ecosystem can impact the tourism industry through altering the natural heritage that Newfoundland currently markets. Salt-water intrusion into groundwater resources has stressed the capacity of L'Anse-aux-Meadows, one of Newfoundland's tourism attractions, to accommodate the thousands of visitors who arrive at these Viking sites. The salinization of the water has been accelerated because of the high number of tourists that the area currently accommodates and this has prevented any further tourism development. The authors identify transport, which is closely linked to tourism (Page, 1994), as an area of potential risk due to coastal erosion and rising sea-levels, both of which are related to climate change. The section regarding tourism notes that there are potential risks and benefits to the industry in

Atlantic Canada. It suggests that the industry monitor and respond to the changing climate. The authors note a lack of research concerning tourism and climate change, especially at the local levels (Vasseur and Catto, 2008).

2.3.3 Climate and Tourism

Before delving into the effects of climate change and global warming on tourism, it is essential to examine the importance of climate and seasonality within the tourism industry. Natural seasonality is the variations in climate throughout the year and their effect on leisure activities (Bar-On, 1975). This relationship of climate/weather and tourism/recreation first appeared in academic literature during the 1960s and 1970s. These works eventually became the study of tourism and climate change with landmark studies emerging in the late 1980s in unison with the coordinated efforts of the United Nations to address climate change (Scott, Jones, & McBoyle,, 2004; Scott, Wall, McBoyle, 2005).

As this study moves deeper into the climate-tourism relationship, a definition of weather and climate is necessary. Weather is the short-term (hourly to daily) conditions of the atmosphere. Climate is the long-term average of weather at certain locations (Scott and Jones, 2006a; IPCC, 2007, Contribution of working group I). These terms are often used interchangeably despite their difference.[*]

Tourism is intrinsically linked to the physical environment, which includes climate (Lerner and Haber, 2001; Martín, 2005). Gunn (2003) notes the importance of considering climate and weather in the planning and developing of tourism. The author

[*] An example of this occurred during my site visits when a local of Twillingate, upon learning of the focus of my research, exclaimed with a laugh, "You want to see climate *change* in Newfoundland? Just go outside, wait 5 minutes and bang! The climate changed!"

also explains that although sunny and warm are the typical preference, countries such as Canada make no attempt to compete in this market and simply promote travel appropriate to their cooler climate. While there are few ways for a tourism industry to overcome the effects of climate, extending tourism-seasons or investing in out-of-season tourism initiatives are possible adaptations (Baum, 1999; Gunn, 1994).

The importance of the link between climate and holidays was originally investigated by Bar-On (1975) and these yearly variations in natural climate and in institutional holidays has become known as "seasonality." There exists both natural seasonality, which is a result of regular variation of climate, and institutional seasonality, which is a result of human decisions. Essentially, seasonal patterns are natural, while vacation and holidays are institutional. Often, seasonality is seen as a problem that the tourism sector needs to overcome and it is often blamed for the under-utilization of tourism resources and facilities (Bar-On, 1975; Baum and Lundtorp, 2001). Seasonality, as defined by Butler (2001, 5), is the "temporal imbalance in the phenomenon of tourism…" This has become an issue of even greater complexity in recent years because it is hypothesized that climate change may shift traditional seasonality to new parts of the globe (Butler, 2001; De Freitas, 2005). Baum and Lundtorp (2001) identify seasonality as a major issue in the tourism industry, especially in cold-climate areas. It affects all aspects from marketing, labor, finance, management, and operations.

Martín (2005) highlights the close relationship that exists between tourism, climate, and weather. He asserts that tourism planning needs to carefully analyze all the factors associated with climate and weather. Aspects of climate and weather are crucial to the proper development and design of tourism projects. This article is useful in its general

definitions and breakdown of the various linkages that exist between climate, weather, and tourism. It notes that many summer tourism products rely on cultural tourism, which, though somewhat sensitive to climate are largely immune to weather related factors (Martín, 2005). The winter industry, on the other hand, is dependant on climate, through precipitation and temperature. Scott, Wall, and McBoyle (2005) believe that adaptation strategies to climate change are an underdeveloped area in the literature. Martín (2005) offers diversification as an adaptation to issues of seasonality. Diversity can also allow for a longer tourism season, which generates a higher rate of return on the original capital investment.

Seasonality is displayed through the different travel patterns of visitors. One such pattern is known as "two-peak seasonality." This entails a major peak (commonly in the summer) and a minor one (commonly in the winter) (Butler, 2001; Bar-On, 1975). For example, this would describe a traditional summer tourism pattern with a secondary promotion of skiing and snowmobiling in the winter. Remote and peripheral areas are more prone to the negative issues of seasonality, but the problems are also often linked to issues of accessibility. Butler (2001) believes that although seasonality is frequently discussed in tourism literature, little in-depth research has been done on it. He acknowledges that while tourism industries and governments have attempted to shift seasonality and visitor patterns by their own means, it may be climate change that accomplishes this.

The relationships between tourism and climate are explored in the works of Amelung, Nicholls, and Viner (2007) and De Freitas (2005). Weather and climate can act as either push or pull factors when travel is considered. The issue of global warming

further compounds this relationship. Tourism is the world's largest industry and it is climate dependant, yet there is a dearth of literature concerning the implications of projected climate change on this industry. As global temperatures rise, certain areas of the world will experience longer or shorter tourism seasons (Scott, Wall, and McBoyle, 2005; Amelung, Nicholls, and Viner, 2007).

An advanced summary (Scott *et al.*, 2007) for the Second International Conference on Climate Change and Tourism was put forward by an international team of experts commissioned by the United Nations World Tourism Organization (UNWTO), the United Nations Environment Program (UNEP), and the World Meteorological Organization (WMO). The experts describe tourism as a highly climate-sensitive economic sector because of its close ties to the environment and to climate. It was also noted that tourism is itself an important contributor to greenhouse gas emissions that enhance global warming. The report discusses the impacts and adaptations tourism destinations must consider because of climate change.

The report states that climate is a principal resource of the tourism industry. Changing climate results in changes in the length and quality of tourism seasons and impacts the competitiveness and profitability of businesses operating in this sector. Data indicates that desirable tourism destinations will shift towards higher latitudes, potentially positively impacting destinations such as Canada. Negative impacts of climate change upon the natural environment are also expected and they require attention, as they can be detrimental to tourism resources. As climate change alters environments, there will be both winners and losers within the tourism industry. As with all industries, tourism will be forced to adapt to the changing climate to minimize damage. Tourism has great

capacity to adapt because consumers have a wide range of choice in destinations. Despite the importance of adaptation, it is a topic that is often neglected in many impact assessment studies and long-range planning strategies of the tourism sector.

The report also raises the possibility of climate change altering travel patterns and increasing the demand for local tourism. Climate change may also alter seasonality, shifting the industry's tradition peak tourism period. The report makes it clear that the impacts of climate change on tourism will intensify over time. Climate change already threatens global ecosystems and will redistribute the climate-related resources for all industries, including for tourism. Significant to the purpose of this literature review, the authors identify tourist preferences and perceptions of climate change as important knowledge gaps (Scott *et al.*, 2007).

Scott, McBoyle, and Mills, (2003) use GCMs and the LARS-WG to assess the vulnerability of the skiing industry of Southern Ontario to climate change. A snow model was built to project ski and snowmobile season length. Dr. Scott provided the same model for this thesis. The article uses short (2020s), medium (2050s), and long-range (2080s) forecasting in their assessment. The varying ranges allow for different tourism responses to be developed. A similar study is presented by Scott, McBoyle, and Minogue (2006), where the authors study the effects of climate change on the Quebec's ski industry. Both the methods and the results are pertinent to this thesis. In addition to this, the results will be useful in assessing the competition Newfoundland and Labrador will be facing in attracting tourists.

Building on the work of the two previously noted studies, Scott, Dawson, and Jones (2007) apply the same methods to the ski and snowmobiling industry in the

Northeastern United States. Their results demonstrate the strong influence the rising temperature and changing precipitation can have on winter tourism, as both industries are at risk. Techniques for adaptation are also offered through snowmaking technologies, although only the larger ski resorts are able to afford this method of adaptation. This adaptation technique is also impractical for snowmobiling. The research by McBoyle, Scott, and Jones (2007) uses the previously mentioned snow simulators to assess the risks that rising global temperature will have on the snowmobiling industries across Canada. Their findings on Newfoundland are preliminary and leave room for a more in-depth study, as the western portion of the island is overlooked.

Scott and Jones (2006) wrote a report on the impacts of climate change on the visitation of national and provincial parks in Canada. Their methodology is very useful for the goals of this thesis. The direct impact of climate change and visitation was measured by creating a relationship between climate and monthly visitation data. Indirect impacts, for example the vulnerability of animals, glaciers, plant life, and other aspects of national parks, are also considered. Scott and Jones (2006) conclude that visitation to Canada's national parks will increase, especially in the shoulder seasons. Whether the economic benefits of increased visitation outweigh the possible ecological stress and carrying capacity stress remains to be seen.

As natural environments are important tourism products, the work of Suffling and Scott (2002) concerning national parks is of interest. The authors' research concerns the impact of climate change on the Canadian National Parks system. Using temperature and precipitation scenarios, impact assessments are examined. Of the studied sites, Gros Morne and Terra Nova are of particular importance to this study, as they are the two

national parks of Newfoundland and Labrador. Both parks are expected to see major increases in temperature and in precipitation in the long-term, according to climate scenarios. The authors note that due to the complexity of ecosystems, mitigation and adaptive measure within protected areas are difficult to predict. It is expected that climate change will alter tourism patterns within the parks and increase visitor demand. The authors recommend vulnerability assessments of individual parks be carried out and advocate for more research to be carried out in regards to the responses of tourism to climate change.

The study by Scott, Jones, and Khaled (2005) advises the National Capital Commission on the potential effects climate change will have on the major tourism attractions of the capital region. The authors select the three most prominent events, Canada Day, the Tulip Festival, and Winterlude, and assess how climate change will impact them. They also offer recommendations for adaptation and mitigation techniques. Similar to this study is the work of Scott and Jones (2006c) regarding climate change and seasonality in the tourism and recreation sectors of Canada. The authors note that there is a limited understanding of the potential risks and benefits of climate change. Sectors with the winter and warm-weather tourism industry were selected and analyzed against climate models. Although few of the results pertain directly to Newfoundland and Labrador, one finding of interest suggests that the golf industry of the east coast may see benefits from global warming in the medium (2050s range) to the long term (2080s range). The impacts were assessed and adaptations recommended. The structure of these reports, as well as their methodologies, will be applicable to this research, as will be explained in the methodology section.

The impact of climate change on the golfing industry was examined for the Greater Toronto Area (Scott and Jones, 2008) and for different regions of Canada (Scott and Jones, 2007). The golf model built by the authors to project season length was provided by Dr. Scott for this thesis. Golf is one of the largest recreation sectors in Canada and it had operating revenues in excess of CDN $2.4 billion in 2007 (Scott and Jones, 2007; Statistics Canada, 2009). Variations in climate can have both positive and negative effects for golf courses. Because Canada is so geographically large, it encompasses a range of climates. The West Coast courses tend to have a longer season and the East Coast courses tend to have a short one. GCMs were used and downscaled using the Long Ashton Research Station Weather Generator (LARS-WG). This replicated the statistical attributes of the local climate to allow for specific climate change scenarios. The results saw little lengthening of the West Coast golf season, a moderate lengthening of the Ontario golf season, and a substantial lengthening of the East Coast golf season. These would have economic advantages as longer seasons could contribute to higher course revenues. Costs of climate change for golf courses include water availability, shifting tourist patterns, and the impact of the climate on the course itself (turf, grass, disease, etc.). Golfing associations are becoming aware of the potential impacts of climate change on their sport (Scott and Jones, 2007).

2.4 Gaps in the Literature

This literature review has presented the relevant discussions concerning the three major themes of this thesis, Newfoundland and Labrador, tourism and climate change. Newfoundland and Labrador is an area that, especially because of its uniqueness, requires

more academic attention. Tourism, despite the groundwork laid by the aforementioned academics, still has room for more literature within its discipline. Climate change is acquiring a very impressive volume of literature and interest. It is a topic that has a rapidly expanding amount of academic interest but its interaction with tourism is an area that requires more study. The potential impacts of climate change on Newfoundland and Labrador are also under-examined. These gaps in the academic literature allow this thesis to combine the three topics of Newfoundland and Labrador, tourism, and climate change in its study. The review of the relevant literature has shown that there is room for a study concerning the potential impacts of climate change on the Newfoundland and Labrador tourism industry. This thesis proposes to add to and help close these gaps in the literature.

CHAPTER THREE: METHODOLOGY

3.0 Methodology

This chapter will outline the steps taken in the design of this thesis. A combination of qualitative and quantitative methods was used to generate more widely based and applicable results. Creswell (2003) notes that the mixed-methods approach is a type of research that, while relatively new, is of growing interest. Because both statistical (models) and textual (interviews and document analysis) methods are employed in this thesis, a mixed-methods approach is the most appropriate term to apply to the study. This will allow for the conclusions and recommendations to take into account both quantitative and qualitative information. This study also follows concurrent procedures, when the qualitative and quantitative data is collected independently and the results are separated. The only influence was the qualitative research directing the initial focus of the quantities process. In the interpretation, the results were integrated and examined with one another. The two modes of research were mutually informative and clear linkages will be displayed (Creswell, 2003; Bryman, 2007). The methodology chapter has been organized to address qualitative methods before proceeding to the quantitative methods.

3.1 Qualitative Methods

A qualitative methodology was used to gain additional information about the tourism industry in Newfoundland and Labrador beyond what was learned from the literature, as discussed in Chapter 2. The combination of a document analysis and

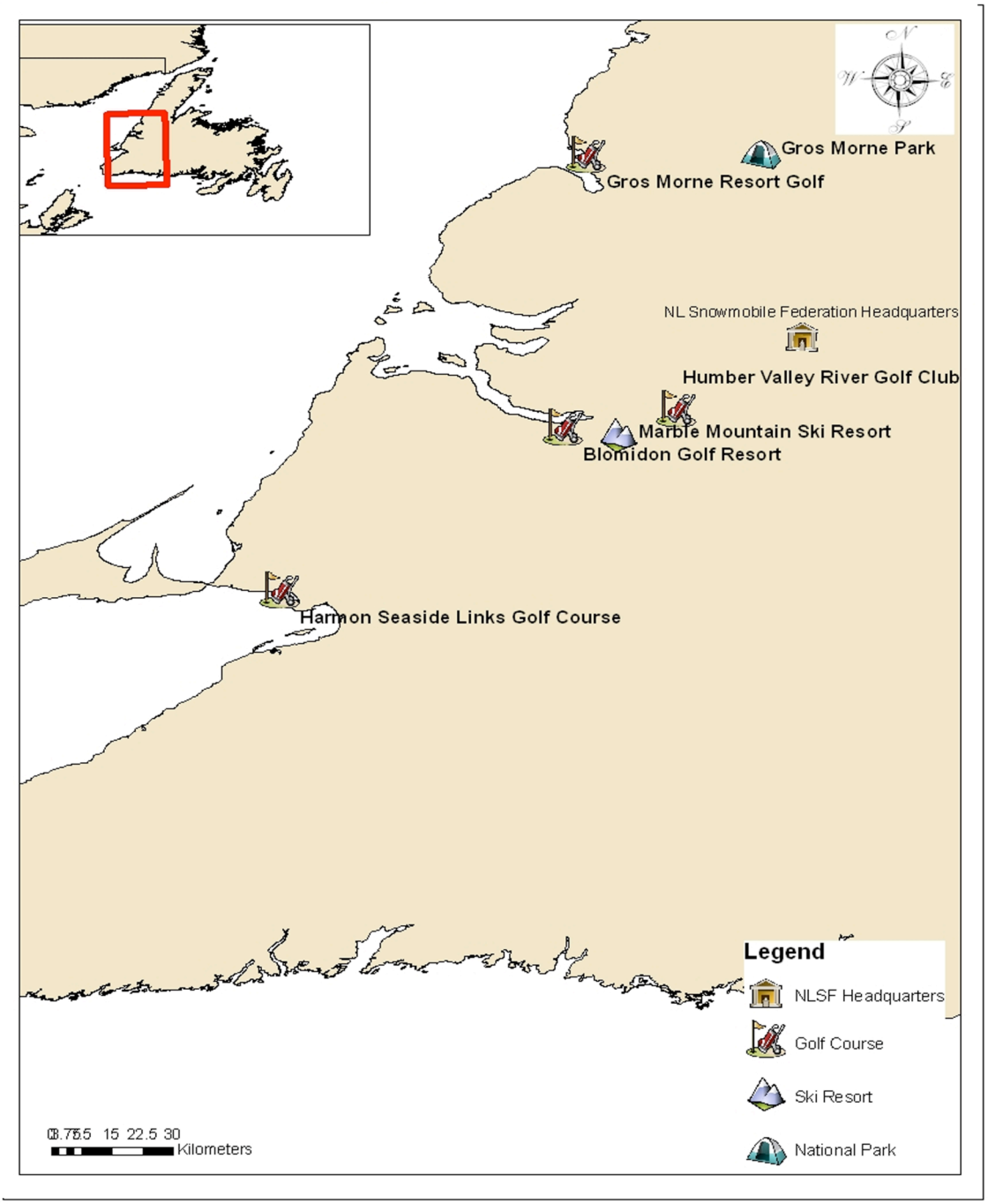
interviews with experts helped to shape the direction of the quantitative research and the focus of the thesis. This also reinforces the validity of the findings by triangulating the data sources. The interviews and the documents provide different data sources that will strengthen the final analysis of this thesis (Creswell, 2003). The methods will be presented in the order that the researcher completed them.

3.1.1 Interview Methods

In order to best understand and evaluate the tourism industry of Newfoundland it was necessary to travel to the island. Traveling to Newfoundland allowed for some of the interviews with experts to be conducted face-to-face and it also presented the researcher with the opportunity to experience the tourism industry firsthand. Four initial sites of interest were chosen for their significance to the industry: Gros Morne, Marble Mountain, Twillingate, and St. John's. At each site, informal conversations with tourists, operators, and local people helped define which sites were appropriate for this study and what issues were most important. These site visits and learning from the locals formed the basis for the interview guide, which was created later.

Upon completion of the site visits, western Newfoundland was selected as the case study for this thesis. A study of tourism development in western Newfoundland allowed for the inclusion of both Gros Morne and Marble Mountain, two of the sites of initial interest. The natural environment is the primary tourism product in this area and therefore has a direct relationship to climate. There are a number of recreational and tourism sites in this region that depend on the natural environment (see Figure 3.1).

Figure 3.1 Map of Tourism Sites of Interest in Western Newfoundland



Projection: NAD 83
Date: August 20, 2009
Data Source: DMTI and NRCan

Another reason to focus on western Newfoundland was the interest in the topic and the willingness to help shown by members of the tourism industry in this area. The other potential sites had factors that made it difficult for them to be used as case studies in this thesis. Twillingate was decidedly too small for a proper study and its main tourism attraction of iceberg watching is depended on the climate of Greenland, not that of Newfoundland. St. John's relies less on natural tourism products as it does cultural tourism, which is less dependant on climate variations.

Both throughout and after the site visits, a series of interviews were conducted with people who were directly involved in the tourism industry of Newfoundland. The interviewees were purposefully selected to maximize the richness of the data. The interviews were individual and in-depth. When it was possible, face-to-face interviews were carried out, and telephone interviews were used when that was not possible (DiCicco-Bloom and Crabtree, 2006; Palys, 1992).

The interview questions were qualitative in nature. Because the research seeks to explore tourism industry patterns, semi-structured interviews were used. The interviews were scheduled ahead of time and organized around a set of predetermined questions. Prior to the interviews, participants were sent an email with the necessary ethics clearance, research outline, and interview questions. Before the submission of the thesis, participants were given the option of vetting the information taken from the interviews (for details see A-3).

The purpose of these interviews was to determine the current state and future directions of the tourism industry in western Newfoundland. While plan and policy analysis was also used, the interviews were conducted to allow for a more informal and

less theoretical view of current state of the tourism industry. Interviews also gave the opportunity to the participants to expand upon the information found in the document analysis and literature review. It also allowed the in field experts to give directions and suggestions.

While the original purpose of the interviews was purely qualitative, they also resulted in the collection of some quantitative data. For example, what was meant to be a purely qualitative interview with the general manager of Marble Mountain Ski Resort, Anne Pinsent, led to her later providing several years worth of detailed data on annual ski visits to Marble Mountain. Similarly, the interview with the executive director of Golf Newfoundland and Labrador, Greg Hillier, led to him providing an estimate of the expenditures incurred by an average golfer in Newfoundland and Labrador. This quantitative data was used in conjunction with the golf and skiing models, described in more detail in the quantitative section.

3.1.2 Document Analysis

Current plans and policies put forward by the Newfoundland and Labrador Department of Tourism, Culture and Recreation were examined. This showed the direction that the department is taking. In particular, documents that specifically address the issue of climate change and its potential risks and benefits associated with it were useful.

These documents were examined using the general plan evaluation approach put forward by William Baer (1997) as a guide. Baer created the criteria to help correct the dearth of professional guidelines within the planning community for plan evaluation. His

work is useful because it allows an individual to draw from his criteria to develop their own evaluation. For this thesis, only certain aspects of Baer's plan critique were deemed to be suitable ways to evaluate plans and policies. His evaluation criteria are divided into two major sections, the planning process and the post-hoc plan evaluation. Post-hoc evaluation was deemed most appropriate, as the majority of the plans examined are several years old. Still, at times this was not possible, as the plans examined by this thesis date from 1990 to 2009 and the more recent plans continue into the future. Therefore, these recent plans have no measurable results that can be analyzed. Therefore, for the purpose of this study, implementation was used as a reference point in assessing the effectiveness of the plans. According to Baer, the criteria for plan evaluation are individual and based on the critic's judgment and conceptive skills. He also provides several lists of criteria when creating a system for classification. Baer notes that arrangement is rarely systematic but is still useful in introducing new concerns, in this instance climate change, to the process. In this document analysis any references to climate change were drawn out and highlighted. Baer's plan evaluation work was used because of the flexibility it offers the researcher regarding the assessment.

3.2 Quantitative Methods

This section will examine the quantitative methodology. Three models were used, the LARS Weather Generator, the Snow Model (also referred to as the Ski Operations Model), and the Golf Model. Because these models are experimental designs, they are considered quantitative in nature (Creswell 2003; Palys, 1992). The Snow and Golf models assume an empirical lineage and focus on climate. The models operate under a

ceteris paribus assumption, as other variables are ignored. Each of the three models will be presented separately. The LARS Weather Generator will be explained first because its output is used as input for both the Snow Model and Golf Model.

3.2.1 LARS Weather Generator

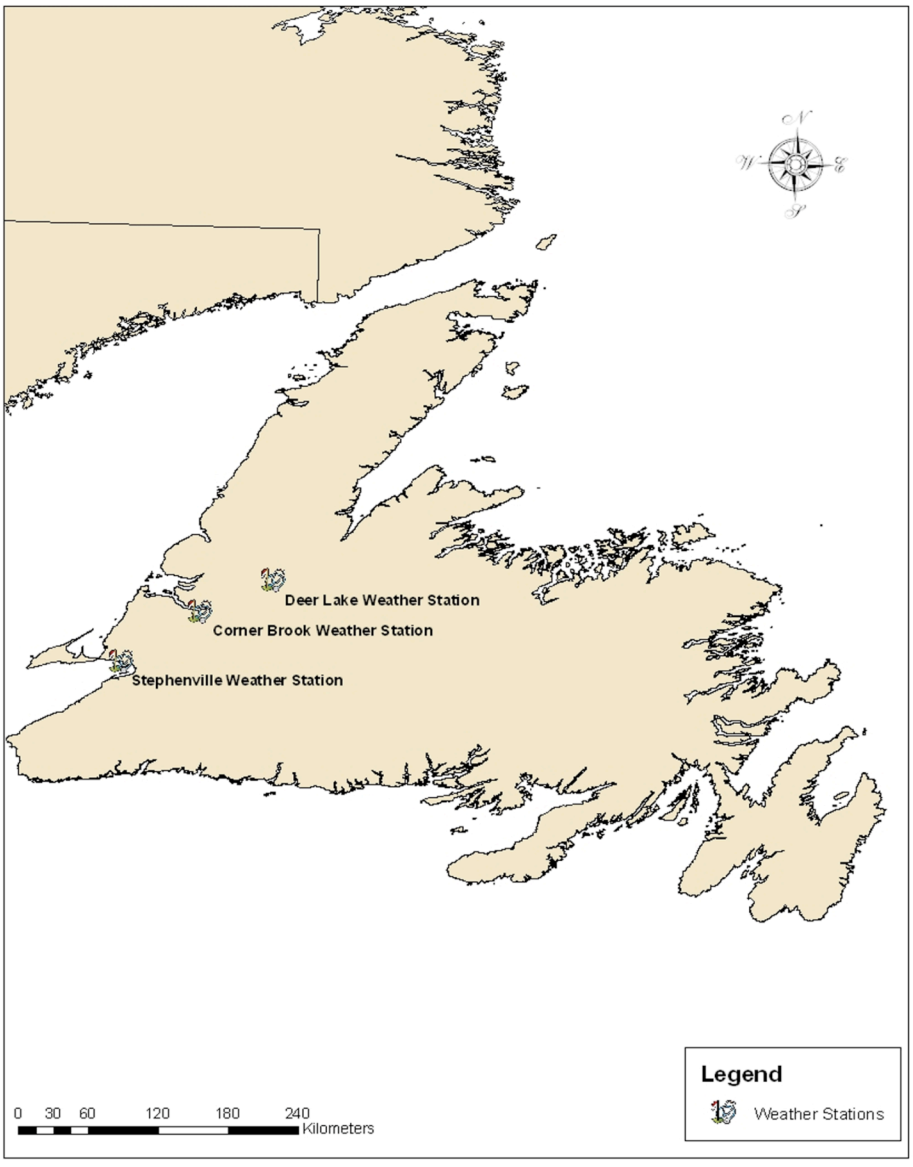
The Long Ashton Research Station Weather Generator (LARS-WG) is a stochastic weather generator used to simulate weather data at a single site. Dr. Mikhail Semenov, of Rothamsted Research, created the model. Dr. Semenov was contacted in order to obtain the rights to use this model for this thesis and permission was granted on May 10, 2009. The weather generator was created to correct a deficiency of General Circulation Models (GCMs), another climate projection tool, which are spatially broad in their results.

The LARS-WG does not predict the future climate. Instead, its purpose is to simulate weather statistically based on observed weather data. This observed baseline is over the time period of 1961-1990. This statistically generated weather is then used to create impact assessments. In addition, this weather generator can use the data provided by GCMs and allow for a more site-specific analysis (Semenov and Barrow, 2002).

Observed weather station data is needed to calibrate the LARS-WG so it can create synthetic weather. The Deer Lake weather station was selected because it is located centrally within the study area. In addition the Deer Lake station provided a rich historical dataset with little missing information. The available information from Deer Lake extends from 1933 until 2006. The years 1961 to 1990 were required to calibrate the LARS-WG. The records from Deer Lake for this period were collected with little missing

information. Missing data, in the form of temperature or precipitation, was filled using information from either the Corner Brook weather station or the Stephenville weather station. These sites were chosen as secondary sources for two reasons. First, the stations are relatively close to Deer Lake and all three stations are within the western Newfoundland study area (see Figure 3.2 below). Second, Pearson's Correlation, which is a coefficient that measures the correlation between variables, was run on the monthly averages of the historical datasets from all the weather stations and they were deemed statistically significant.

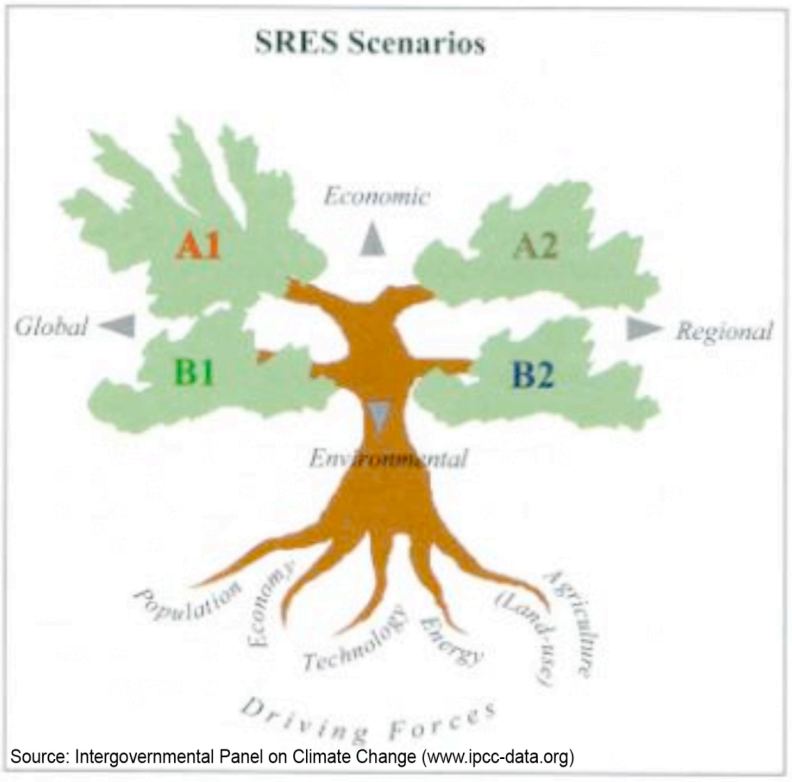
Figure 3.2 Map of Western Newfoundland Weather Station Used



In order for LARS-WG to create future climate scenarios, GCM data was necessary. Two GCMs were selected to give a plausible range in the forecast. These were MIROC32 hires_A1B and BCCR-BCM20 B1-run1. The justification for these two

selections comes from using the Pacific Climate Impacts Consortium website, where all available GCMs were examined. A scatter plot of temperature over precipitation was created for each of the time slices available, 2020 (2011-2039), 2050 (2040-2069), and 2080 (2070-2100). The outlying GCMs, which consistently projected higher or lower temperatures than the majority, were selected to frame this thesis' projections. From the outliers, the two GCMs were selected (Pacific Climate Impacts Consortium, www.pacificclimate.org, accessed May 15, 2009). The GCMs and the storylines that these models exist within will be explained visually and textually below.

Figure 3.3 IPCC Special Report on Emissions Scenarios, Visual of Storylines



MIROC32 hires_A1B was selected as a GCM that consistently projected warm temperatures for the province of Newfoundland and Labrador. MIROC is a model belonging to the CCSR/NIES/FRCGC in Japan. Its name is an acronym for Model for

Interdisciplinary Research on Climate. The A1 emissions scenario (see figure 3.3) this model is based on follows a future storyline that projects a growing global population and a balanced growth in all energy sectors.

The cooler GCM selected was BCCR-BCM20 B1-run1 (Bjerknes Centre for Climate Research) from the University of Bergen in Norway. This model falls under the B1 storyline and scenario family. The B1 storyline projects a merging world with the same growing global population as in the A1 storyline. Unlike the A1 storyline, B1 sees rapid changes in economic structures toward a service and information economy, reductions in material and resource based intensity, and the introduction of clean technologies (www.IPCC-data.org, accessed May 15, 2009).

From both of the aforementioned GCMs, the following data was extracted: year, month, minimum temperature, maximum temperature, and precipitation. Spreadsheets were prepared with this data for the three time periods of 2020 (2011-2039), 2050 (2040-2069), and 2080 (2070-2100). Each time slice file for either GCM was processed through the LARS generator. The output created included the categories of year, minimum temperature, maximum temperature, and precipitation. The detailed information provided is not necessary to include in this thesis. Averages of the results were used for greater clarity and simplicity.

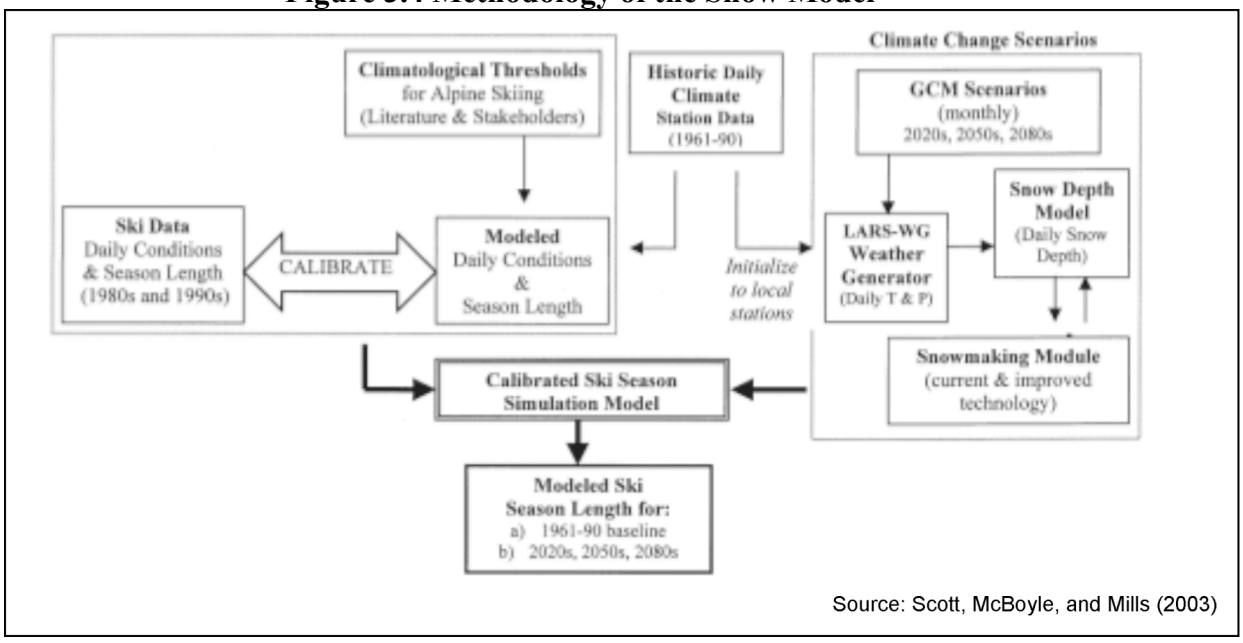
3.2.2 Snow Model

The Snow Model that was used in this thesis assesses both ski season and snowmobile season vulnerability to climate change. The Snow Model was provided by Dr. Daniel Scott, a professor at the University of Waterloo and the Canada Research

Chair for Global Change and Tourism. The model consists of several subcomponents. The snow model portion models natural snow cover on the ground based on the climate input. The snowmaking module was added to make the projections more realistic, as ski resorts have the capacity to compensate for poor natural conditions. The final subcomponent, the ski operations decision system takes the decision criteria of operators into account. This includes start and end dates, minimum snow base required until the end date, the necessary temperature for snowmaking, snowmaking capacity, and maximum allowance for liquid precipitation. The model requires the temperature and precipitation outputs created by LARS-WG in order to make snow projections (Scott, McBoyle and Mills, 2003; Scott and Jones, 2006c).

The following graph (Figure 3.3) visually explains the components of the Snow Model.

Figure 3.4 Methodology of the Snow Model



As can be seen in the "Snowmaking Module" bubble in the above figure, the model will make ski and snowmobile seasons projections based on natural snow depth and snowmaking capability. Snowmaking is further divided into "current" which will project ski seasons using current snowmaking practices and "improved technology" which creates projections based on more efficient snowmaking technologies.

The model projects the appropriate ski and snowmobile season length in days. The validity of the ski projections were tested by comparing the modeled ski seasons of 1999/2000-2007/2008 to the recorded visitor number. The visitor data consisted of both local users and tourists. Because the models do not project visitors, but, rather season length measured in days, it was unnecessary to separate the two categories. Anne Pinsent provided the recorded data. This recorded data also allowed for an examination of the number of ski visits per day and how skiers react to a shortened season.

3.2.3 Golf Model

The Golf Model used in this thesis was also provided by Dr. Scott and was developed for previous studies of the golf industry in Canada (Scott and Jones, 2006b; Scott and Jones, 2007). The model creates a link between weather and golf through an empirical regression relationship based on observed weather data and observed rounds of golf played. This relationship can then be projected into the future by using LARS-WG climate data and scenarios. The model projects the potential number of rounds of golf per year. These projections were combined with the average cost associated with a round of golf, as provided by Greg Hillier, in order to create an economic impact analysis.

The original model was calibrated to the visitor demand of golf courses near the Greater Toronto Area. A later model was recalibrated for a study on a golf course in Cape Breton. This recalibrated model was used for this thesis and was considered acceptable because Cape Breton and Newfoundland are proximate to each other and have similar geographical and social features. Ideally, a golf course within this thesis's study area of western Newfoundland would have provided visitor data so the model could be specifically calibrated to western Newfoundland. Unfortunately, no golf courses were willing to provide such information.

3.3 Ethics Approval

This thesis has received full ethics clearance from the University of Waterloo. The Office of Research Ethics (ORE) awarded this research provisional ethics clearance on May 15, 2008. After completing the ORE's revisions, a full clearance was provided on May 21, 2008. All interview participants were contacted prior to their interview and

provided with the appropriate information and consent forms. Participants were asked for consent prior to the use of their name and title in this thesis. All participants were given the opportunity to vet the information taken from their interview. A copy of the information letter and the letter of consent is included in the appendix (A-2).

CHAPTER FOUR: FINDINGS

4.0 Findings

This chapter will present the qualitative and quantitative findings of the current research. Qualitative and quantitative results will be presented separately. These results will be evaluated and synthesized in Chapter 5.

4.1 Qualitative Findings

The qualitative findings that will be examined are the product of a series of interviews and a review of documents related to tourism in Newfoundland and Labrador. The qualitative findings will be examined before the quantitative results, because the research began by interviewing people directly involved in the Newfoundland and Labrador tourism industry and the direction and focus for the subsequent research grew from the information gained in those interviews.

4.1.1 Interviews

Interview Methodology

The interviews with individuals involved in the Newfoundland and Labrador tourism industry were conducted both face-to-face and by telephone. An interview guide was prepared in advance and emailed to all participants prior to the interview. The guide is attached in Appendix 1. The following section will combine answers to the interview questions in an attempt to identify common themes. Detailed notes taken during each

interview are included in Appendix 3. Below (Table 4.1) is a listing of those who were interviewed, their title, as well as when and how the interview took place.

Table 4.1 Summary of Interview Participants			
Name	Title	Date	Medium
Greg Hillier	Golf Newfoundland Labrador, Executive Director	June 17, 2008	In-person
Dr. James Overton	Professor, Memorial University	June 23, 2008	In-person
Ken O'Brien	St. John's, Manager of Planning and Information	August 21, 2008	By phone
Penny Brake	Newfoundland and Labrador Snowmobiling Federation Executive Director	September 19, 2008	By phone
Andy Hennebury	Tourism Product Development Officer	October 23, 2008	By phone
Juanita Keel-Ryan	Director, Tourism Product Development	October 31, 2008	By phone
Anne Pinsent	Marble Mountain General Manager	November 14, 2008	By phone
Dr. Norm Catto	Professor, Memorial University	November 14, 2008	By phone
**All those interviewed agreed to be identified by name.*			

Interview Findings

Four themes emerged from the interviews: tourism is an important part of the Newfoundland and Labrador economy; the greatest tourism assets of Newfoundland and Labrador are its unique culture and geography; accessibility and marketing are the tourism industry's top priorities; climate change and environmental sustainability are not priorities of the Newfoundland and Labrador tourism industry. Because the tourism industry of Newfoundland and Labrador is characterized by top-down management, references to the Department of Tourism, Culture and Recreation (hereafter TCR) are

made throughout. The interview findings will be presented to develop the four major themes.

Tourism is an important part of Newfoundland and Labrador's economy

Every interview participant ranks tourism as a very important industry and considers tourism to be a significant part of the Newfoundland and Labrador economy. Several participants note that tourism is crucial for many outports. On the other hand, two interviewees point out that while important, tourism cannot replace the fisheries, either financially or socially.

Because tourism is an economic driver and the Department of TCR guides it, references to the Department will be included in this section. When asked about the province's direction, most interviewees believe there exists a good relationship between government and industry. For example, Anne Pinsent describes the province as very supportive of Marble Mountain and other forms of tourism development in the area.

Despite the overall agreement with the direction of the Department of TCR, several participants identify technology and planning for the tourism industry as areas that the department can improve. One respondent points out that there is a lack in funding for regional tourism associations. So while there is a good relationship among the tourism operators, it can be concluded that this relationship could be improved.

The greatest assets of Newfoundland and Labrador are its unique culture and geography

Regardless of their specific role within the industry, all those directly involved in tourism in the province agree that Newfoundland's most marketable assets are: "natural

assets," "wilderness," "geography," and "scenery," as well as "people," "tradition," and "culture." Essentially this can be grouped into two general assets, as culture and geography. The uniqueness of these cultural and geographic resources is an opportunity that the tourism industry realizes and markets as such, though one respondent expresses a fear that if the Department of TCR is not cautious in its marketing of culture, it could over exploit the unique culture the government is seeking to promote. Less concern is expressed for the natural areas.

The finding of the dominant assets is relevant because of the multiple references to the natural environment. The climate is a part of this natural environment, even if it is not mentioned specifically in the interviews. In addition, natural systems are vulnerable to the effects of climate change. Although not the direct focus of this research, the culture references are also significant because culture could be threatened by the collapse of the cod industry, which until recently has defined Newfoundland.

Accessibility and marketing are the tourism industries top priorities

Responses to the question regarding the tourism industry's obstacles are consistently focused on two issues. First is the problem of accessibility. Newfoundland is an island, and therefore is not the easiest destination for a tourist to get to. The phrase, "No accidental tourists" is used by several respondents to describe the main consequence of this. The tourism industry realizes that planning is required on the part of the tourist to ensure they maximize their time in Newfoundland. Furthermore, Newfoundland's dispersed population makes a vehicle necessary for tourists who must travel once on the

island. Specific issues that operators are concerned with included increasing fuel costs and the difficulty of supplying enough rental cars in high season to meet demand.

While accessibility is a primary concern, another pressing issue is marketing. These two issues are closely linked, as marketing is a way to overcome Newfoundland's inaccessibility. Nevertheless, not all interview participants agree with how this would be achieved. An interviewee believes that the industry's advertising did not provide a balanced image of the various weather patterns Newfoundland experiences. They believe that fog and rain are part of the experience and should be included in marketing efforts. A different interviewee reveals a similar sentiment, saying that fog could be promoted as "romantic." One respondent believes the marketing efforts of the industry could be more efficient. Another respondent believes the actions of the Department of TRC were creating obstacles for the tourism industry, by neglecting promotion and advertising for winter tourism. Still they believe that this will be changing in the near future.

Climate change and environmental sustainability are not priorities of the Newfoundland and Labrador tourism industry

The interview responses focus first on the weather/climate relationship to tourism before moving on to climate change. Some interviewees note that season length is more than a weather related determinant; it is a business decision that incorporates weather along with other variables into the decision process. Respondents in the St. John's area point out that seasonality on the east coast of Newfoundland is more difficult to assess since winters there are inconsistent. Rain and warm spells melt the snow periodically through the winter months. This has made winter tourism based on sports and recreation

in the east difficult. Some provincial employees explain that managing the effects of season length is a project that the Department of TCR is working on. They have recently invested in coordinating businesses to stay open beyond high season. Depending on the results of this venture, which is currently being piloted in several tourism attractions, it may be repeated elsewhere. Another adaptation to seasonality is the creation of four season activities; this is underway at Marble Mountain through a year-round zip-lining attraction, an activity that involves using harnesses and pulleys to ride metal cables, on the hill.

The responses to the questions regarding climate vary. Most explain that tourists do not come to Newfoundland for the weather – they are aware of the area's reputation for varying conditions. These same respondents also explain that this reputation is undeserved. One respondent believes it is this negative reputation that allows tourists to come to Newfoundland without expectations and that has the effect of more readily allowing the culture and scenery to impress them. Another respondent notes that the weather is rarely mentioned in exit surveys administered by the Department of TCR. She goes on to say that the perception of weather in Newfoundland has more of an impact on tourism than the actual weather does.

Penny Brake, executive director of the Newfoundland and Labrador Snowmobile Federation (NLSF), and Anne Pinsent, general manager of Marble Mountain, both believe weather is not a major factor. Both state that those who come to participate in sports and recreation would do so despite the weather and that those who travel with the intent to participate in winter activities are normally prepared for unexpected weather.

Other respondents point out, however, that weather has the potential to ruin large festivals and outdoor events.

Anne Pinsent explains that she attended a ski conference in Kelowna that devoted a section to the affects of climate change on the skiing industry. This shows that the issue of global warming is being discussed. Although climate change was never a primary problem according to the respondents, two of the interviewees are concerned with the impact tourism was having on the environment. Marine litter, which is garbage and refuse in the ocean, and coastal erosion degradation are noted as problems that have an impact on residents and tourists.

Speaking to the climate related focus of this thesis, two respondents think that the general interest in environmental awareness is an opportunity for tourism in Newfoundland. Andy Hennebury believes that tourism can be used to declare coastal areas of public interest, preventing private ownership of the coastline. Anne Pinsent sees green initiatives in accommodations as a way to capitalize on the environmental movement. Marble Mountain's accommodations are working towards achieving an environmentally sustainable certification, known as "Green Key."

To varying degrees, all respondents acknowledge that climate change is an issue, though most believe it to be of secondary importance. Dr. Norm Catto explains that some of the associated threats to a changing climate are the hazards of extreme weather and coastal erosion. Both would have significant impact on the many communities along the coast. The loss of tourism products, such as picturesque coastal fishing communities, is another fear, through coastal erosion. Another area of vulnerability due to climate change is in iceberg watching, as there is the potential of losing the icebergs that drift in the

Atlantic Ocean down from Greenland[1]. One respondent notes that there are both positives and negatives associated with climate change and hopes that the Department of TCR will monitor its impact. Another respondent states that climate change is presently being talked about; proactive action is the next step.

Others explain the opportunities they associated with climate change. Many respondents expect warmer weather in Newfoundland to attract more tourists. Anne Pinsent believes there may have already been opportunities in winter tourism as result of climate change. She notes that an increasing number of European skiers have come to Marble Mountain due to the earlier melts in the Swiss Alps affecting their vacation plans. Several interviewees believe the importance of climate change will shift peoples' expectations towards new tourism providers. According to many respondents, promoting eco-tourism and "greening" its products are areas Newfoundland's tourism sector is already moving towards.

Though climate change is rarely identified as a major threat to the tourism industry, there are some efforts being made to evaluate the impacts of global warming on tourism. Anne Pinsent of Marble Mountain explained that a climate expert had been brought in to host a workshop on the impacts of climate change on the area within the past year. Andy Hennebury indicates that he has recently been asked to sit as the chair representing tourism on an inter-departmental group concerned with environmental issues, including climate change. Dr. Catto is a leading expert on climate change and has done extensive work on coastal erosion in Newfoundland and elsewhere.

[1] Iceberg watching is a popular tourism product in Newfoundland. As icebergs break off glaciers on the west coast of Greenland, they are pulled south along the Newfoundland coast by the Labrador Current.

Summary

Reporting the interview findings thematically identifies the key focuses of this thesis. In an economic sense, tourism is important. The main priorities in furthering the growth of this industry are accessibility and marketing. Nevertheless, Newfoundland's inaccessibility as an island is also considered an advantage, due to its unique geography. There is little indication that the majority of the participants feel that these natural characteristics are threatened by the issues related to climate change. This is consistent with the review of the literature, in which little consideration was given to the natural environment of Newfoundland, while a great deal dealt with social and economic issues.

Therefore in general, it can be concluded that climate change is not regarded as a pressing issue for the tourism industry. Accessibility and marketing are the issues that are of greater concern for most of those interviewed. External factors, such as the slowing economy and the unpredictability of gas prices, are also concerns. The two areas cited as Newfoundland's greatest assets are culture and geography. Many respondents expressed fears that packaging Newfoundland's history and traditions into tourism products may destroy their authenticity. Interestingly, there is less concern for the natural aspects of Newfoundland. Loss of natural features is never expressed as a primary threat to the tourism industry. In addition, there is little consideration to climate change as a positive force for the tourism industry in Newfoundland and Labrador.

The results of the interviews are important in that they reinforce and produce corroborating information with the literature review and document analysis. This strengthens their findings. It underlines that insofar as the majority of the respondents

expressed agreement with the leadership of the department of TCR, the tourism sector in Newfoundland and Labrador can be seen as a top-down organization that allows for more effective action and implementation but which can also results in the failure to notice new problems on the horizon.

4.1.2 Document Analysis

Newfoundland and Labrador Department of Tourism, Culture and Recreation documents and related consulting reports were examined to gain an understanding of the direction of the tourism industry. The themes that emerged form these documents were highlighted in the Literature Review and in the interview questions. The document analysis will complement the interview section. Because there is only small number of Department of TCR documents related to this thesis, the documents researched date back to 1990. The benefit of examining the documents from an extended period of time is that it allows for an appreciation of the direction that the tourism industry has taken. The documents will, therefore, be analyzed in chronological order.

In 1990, a report was released concerning the potential of Marble Mountain as a four-season resort (Davis, 1990). The long history of the ski hill is presented, with the area first being developed for recreational purposes in the 1960s and 1970s. This report discusses the advantages of further development and lists accessibility to the resort as superb, with two regional airports in the vicinity (Deer Lake, 45 KM and Stephenville, 80 KM) and strong linkages to the Port-aux-Basques ferry system by the Trans-Canada highway. The location is also presented as a positive, with the large communities of Corner Brook and Deer Lake nearby. Other nearby attractions include Gros Morne

National Park, the Bay of Islands, Humber Valley, and the Humber River. This plan also notes that previous reports have already recommended this resort become an all-season complex for similar reasons.

This report suggests the government fund the resort until such a time that the private sector is able to commence commercial development of the region. Davis recommends more improvements on the lifts, trails, grooming, and resort base facilities. Suggested improvements for the off-season (summer) include festivals and concerts, as well as accommodations for anglers, outdoorsmen and golfers. The off-season tourism activity is expected to be much slower than the peak ski-season, but it would make use of the complex more efficient.

The following year, another report (Davis, 1991) was released. It focuses on the potential recreational uses for the abandoned railbed, previously owned and operated by Canadian National Railway, which crosses the island of Newfoundland. The report explains the potential for transforming Newfoundland's abandoned railbed into a trail system for snowmobiles. It explains that snowmobiling is a growing tourist and recreational generator. The report notes that, at the time, Newfoundland was the only region in the snowbelt[2] without a groomed trail system. Several successful snowmobile systems are examined as case studies; they include the municipalities of Cadillac, Michigan; Webb, New York; Sudbury, Ontario; Haliburton County, Ontario; and the province of Saskatchewan. These cases show the long-term benefits of investing in a groomed trail system in tax revenue and spin-off employment in the winter tourism industry. The report dismisses proposals for the prohibition of motorized vehicles on

[2] The snowbelt is the northern and northeastern area of the United States and the central and eastern area of Canada. It is the North American region that sees enough snow in the winter months to maintain recreational activities based on it.

railbed in order for it to become a trail for hikers and nature users because, as the tracks measure over 600 kilometres, vehicles are necessary. Climatically, Newfoundland already has the ingredients for a successful snowmobile system with a high snowfall, a long snow season, a substantial base of local riders, and a foundation of existing traditional (i.e. not groomed) trails.

It is recommended that the government become involved in this project, as their financial help would be necessary for a successful trail system. In addition the report recommends a more sophisticated administration be created from the existing motorsports federation. This report expects any government investment in a trail system to pay off. It recommends coordination between the tourism branch (not yet a department), the Department of Environment and Lands, and the Department of Works, Services and Transportation.

In 1994, Dr. Clare Gunn, a tourism planning professor at Texas A&M University, was invited to Newfoundland by Hospitality Newfoundland and Labrador in order to lead a series of workshops (Gunn, 1994). Dr. Gunn highlighted several strengths and weaknesses in his evaluation of the tourism development in Newfoundland and Labrador. Gunn asserted that Newfoundland has a solid foundation for tourism growth, especially in natural resources, cultural resources, and human resources. There are several areas requiring improvement if Newfoundland and Labrador is to move forward with its tourism development. These include a need for greater resource protection, better information, and improved transportation. He also suggests the establishment of major attraction complexes that can deliver compatible attractions. Gros Morne is noted as one such area in which further clustering could be beneficial. Four season complexes are

necessary to overcome the issues associated with seasonality. Other areas of concern were governmental involvement and policy integration, as well as more tourism related research and education.

Gunn sees a greater need for the application of basic tourism planning principles such as clustering and marketing. In the case of clustering, an examination of main attractions and the potential for expansion around them is recommended. Marketing must be narrowly focused and must research its target audience. Due to its island status, Newfoundland would need to use a regional approach to its tourism product. Deer Lake is suggested as a focal point and tourism hub.

In 1995, a development plan for the golf industry was created (Touristics, 1995). This is the most up to date assessment of Newfoundland and Labrador golfing, although a more current industry profile is being prepared at present (Hiller, Personal communication, June 17, 2008). The report is optimistic about increasing the numbers of golfers in Newfoundland and Labrador and the number of potential golfing tourists. Although, the area around St. John's is deemed most appropriate for further development, the western region is an alternate site. In order to create a successful tourism product, it is recommended that golf industry developers take advantage of Newfoundland's attractive scenery, such as Gros Morne in the west. Clustering is also recommended for the western region, which already has two existing airports, the Port-aux-Basques ferry service, Gros Morne National Park, several golf courses, and Marble Mountain. Marble Mountain is highlighted several times as a priority for golf development as the resort desires to be a four-season destination and has existing accommodations. Golf and skiing are often complementary tourism products.

The report indicates that nearby Prince Edward Island (PEI) has a superior golf product but believes that the market for golfing is large enough that Newfoundland and Labrador can attract tourists. Disadvantages for Newfoundland and Labrador include underdevelopment of its courses and a shorter playing season, averaging mid-May to mid-October as opposed to the season of the competition, notably PEI, which runs April through November. Nevertheless, seasonality and weather are variables for all golf courses. Newfoundland and Labrador has a strong local demand for golf and has a great deal of cheap and undeveloped land and the report concludes that it is an area of untapped potential.

Another assessment report, this one created by The Economic Planning Group of Canada (1996), presents two possible winter tourism packages to be created by the tourism industry. Package #1 is aimed at Western Newfoundland and consists of cross-country skiing and camping in Gros Morne National Park, downhill skiing at Marble Mountain, as well as hiking and snowshoeing. This package is helpful in identifying winter tourism attractions for the study area of this thesis. Package #2 concentrates on Southern Labrador and presents the potential for the activities of snowmobiling, camping, taking in a unique culture, dog sledding, and participating in local sports tournaments.

This report also identifies target markets for winter tourism in Newfoundland and Labrador. The European market is identified as a main target, especially Germany, England, and the Netherlands. There is also a perceived niche market within major American and Canadian urban centers. Further profiling of the suggested target market identifies the following characteristics: predominately male; married; university educated; aged 30-49; high-income levels; and interested in a wide range of outdoor

activities. Because of the small target market, the report specifically recommended that mass marketing not be used. Rather, marketing direct to past customers and enquirers and advertising in specialty magazines was suggested.

Another 1996 tourism plan was released by the PLURAM group. The purpose of this strategic document (PLURAM, 1996) is to assess the current practice of snowmobiling in Newfoundland to define a development plan for snowmobile tourism and recreation. It reiterates the initiatives of the 1991 Davis report, but is more inclusive and detailed. Snowmobiling infrastructure is described as underdeveloped but with substantial potential, especially in western and central Newfoundland. Snowmobile registration, at this time, is on the rise. The existing underdevelopment is explained by a lack of groomed trails and a lack of promotion. The majority of the tourism market consists of local residents, while the non-residential market was made up of Atlantic Provinces (mostly Nova Scotia), Ontario, the United States, and Europe. The potential for this tourism product in Newfoundland is based on plenty of snow, longer snowmobile season, open countryside, scenery, and environment. However, there is still a need for the development of groomed trails, promotion, and marketing.

The west and central areas are highlighted for a variety of reasons: heavy snowfall and reliable winter seasons; controlled access to Gros Morne National Park; willing partners at Marble Mountain; proximity to Deer Lake airport and Port-aux-Basques ferry; the highest per capita snowmobile usage; and proximity to the Long Range Mountains. The report suggests that the province build on its potential to create a world-class tourism destination through snowmobiling with Deer Lake as its hub. The report goes on to recommend basic improvements in trail creation, grooming, signage, club involvement,

marketing, and promotion. Similar to the previous report, using the T'railway[3] as a main artery is recommended. It is noted that the current snowmobile product is neither planned nor managed but proposes the province transform this into a major tourism destination within 5 years.

Marble Mountain's operators, Marble Mountain Development Corporation, have released several business plans since their incorporation. The researcher determined that the information provided from past plans was similar enough that only the findings from the most recent report would be examined in a detailed way. This report is Marble Mountain Development Corporation's (2008) three year business plan beginning in 2008. The report documents the staffing of the Marble Mountain resort and its operating board. Its mandate is to develop a four-season resort that will act as a tourism anchor for the western region of Newfoundland. The primary activities of the resort are skiing and snowboarding. An attempt was made to diversify with the addition of snow tubing; however this was removed after several unprofitable seasons.

The resort categorizes its clients into sport enthusiasts, private industry, travelers, special event attendees, and members of the public requiring food and beverage. The primary goal of the plan is to better control Marble Mountain's expenditures and increase revenue by 2011. A land use development plan is to be created for the base area and a terrain development plan is to be created for the hill. Both these plans will make more efficient use of the resort's resources. By 2011, the Corporation will reevaluate the viability of promoting the resort as an all-season tourism attraction. Past attempts to overcome seasonality have resulted in financial loss.

[3] T'railway is the name given to the abandoned railbed, signifying a movement away from rails to trails.

The Department of Tourism, Culture and Recreation periodically publishes strategic plans. The most recent of these plans is entitled "Uncommon Potential: A Vision for Newfoundland and Labrador Tourism" (Newfoundland and Labrador Department of Tourism, Culture and Recreation, 2009). This document names tourism as one of Newfoundland and Labrador's economic drivers, citing revenues of $357 million between 2003 and 2007 with spin-offs generating approximately $790 million. Despite these positive numbers, Newfoundland and Labrador sees room for expansion, based on the pillars of tourism: people, culture, and natural environment. Residents of the province are key in this expansion, as they provide over half of all tourism spending.

The Department of TCR seeks to develop tourism into a sustainable industry that will outlast the industries of extraction of non-renewable resources. The benefits for the rural communities are expected to be substantial but challenges to the department's goal of doubling the number of annual tourists by 2020 include travel barriers, access, and slowed growth. Marketing strategies have been effective and, therefore, are slated to continue. The suggested creation of a new tourism board should better organize the input from the various stakeholders in the tourism industry. An increase in research, workforce development, and technology is suggested, as these areas are left wanting. The three pillars are to be the basis for the increased development of the tourism product: "The strength of our industry is based on renewable resources – our land, our culture, and our people. Managed correctly, tourism can flourish, preserve, and sustain our culturally-rich urban and rural communities throughout our province" (The Department of Tourism, Culture and Recreation, 2009, 31).

Summary

Common themes drawn from the plans include ideas of unrealized potential and lack of implementation. As explained in the Methodology chapter, Baer's subject of implementation would be used in analyzing the documents. Many of the early consulting reports see tourism products like skiing, snowmobiling, and golf as areas of great potential. This same approach can be applied more broadly to the tourism industry in general, where "potential" is a common descriptor. Nevertheless, the implementation strategies are rarely followed, as demonstrated by the repetitive conclusions of reports over the past two decades. Nevertheless, the reports do suggest significant progress. Marble Mountain's business reports show increasing visitation and the Department of TCR strategic plan suggests that tourism is a growing industry that can progress even further. These themes will be examined in the following chapter in conjunction with the other methods of analysis.

4.2 Quantitative Findings

The following will outline the quantitative findings from the models used in this thesis. The Long Ashton Research Station Weather Generator's data will first be presented. The snow and golf models will be presented next as their projections are based on the results of the information generated by the LARS-WG. As explained in the previous chapter, the projections provided by the Golf Model and the Snow Model are based on climate variables only. This thesis recognizes there exist many other important variables in the tourism industry (prices, marketing, transportation, etc.) that are not being taken into account. The focus in this research is on the climate-tourism relationship.

4.2.1 LARS Weather Generator

The synthetic historical projections, which are created by LARS-WG based on the observed data from Deer Lake, provide a base for comparisons. The data is expressed in daily means, which were converted into annual averages. Average annual precipitation is 2.837786975 millimeters daily and the average annual temperature is 4.063351827 degrees Celsius daily. The two future scenarios will be presented separately, after which, all results are summarized in a table.

As expected, the MIROC32_hires A1B-run1 model projected a higher degree of warming than the BCCR-BCM20 B1-run1. Over the next 90 years, MIROC32_hires A1B-run1 projected an approximate warming of approximately 5 degrees Celsius, from an annual average of 6.71 degrees in the 2020 time slice to 11.21 degrees in the 2080 time slice. Because the LARS-WG projects each 30 year time slice separately, it is also useful to assess the findings within these 30 year periods. The 2020 time slice had an average temperature of 6.71 degrees Celsius and an average annual precipitation fall of 3.12 millimeters. The 2050 timeframe sees averages of 8.83 degrees Celsius in temperature and 3.29 millimeters in precipitation. The 2080 time slice projects an average temperature of 11.21 degrees and an increase of precipitation to 3.58 millimeters. From these numbers, it can be seen that a very slight increase in precipitation is projected in all three future models. Temperature, on the other hand, is projected to increase a significant amount, 7.1 degrees Celsius from the historical synthetic to the 2080.

The BCCR-BCM20 B1-run1 GCM projected much lower increases than the MIROC32_hires A1B-run1 model. The 2020 projection averages to a temperature of 4.51 degrees and 2.88 millimeters of precipitation. The next time slice, 2050, increases in

temperature to 4.68 degrees and decreases slightly to 2.87 millimeters of precipitation. Finally, the 2080 period sees another increase in temperature to 5.28 degrees Celsius and a decrease in annual average precipitation to 2.59 millimeters. Between the historical synthetic data and the 2080 time slice, there is a projected decrease of 0.25 millimeters in precipitation and an increase in temperature of 2.6 degrees Celsius.

Table 4.2 Summary of LARS-WG Results

Model	Time Slice	Temperature (ºC)	Change from Synthetic Historical	Precipitation (mm)	Change from Synthetic Historical
Synthetic Historical	1961-1990	4.063351827	*N/A*	2.837786975	*N/A*
BCCR-BCM20 B1-run1	2020	4.511468184	*0.448116357*	2.884671813	*0.046884838*
BCCR-BCM20 B1-run1	2050	4.675292843	*0.611941016*	2.873722983	*0.035936008*
BCCR-BCM20 B1-run1	2080	5.284224803	*1.220872976*	2.587025893	*-0.250761082*
MIROC32_hires A1B	2020	6.713189382	*2.649837555*	3.120967097	*0.283180122*
MIROC32_hires A1B	2050	8.826270719	*4.762918892*	3.294725954	*0.456938979*
MIROC32_hires A1B	2080	11.20746148	*7.144109653*	3.580037471	*0.742250496*

As explained in the Methods section, these General Circulation Model scenarios were intentionally selected to provide a wide range in temperature projections. The precipitation projections also show a divergence by the 2080 timeframe from positive 0.46 mm to negative 0.29 mm for a difference of 0.75 millimeters. The temperature range increase from 2.2 degrees in the 2020s to 5.93 degrees in the 2080 time period. Projecting a range of possible changes facilitates the planning of a more realistic scenario for managing that change.

4.2.2 Snow Model (Ski and Snowmobile Seasons)

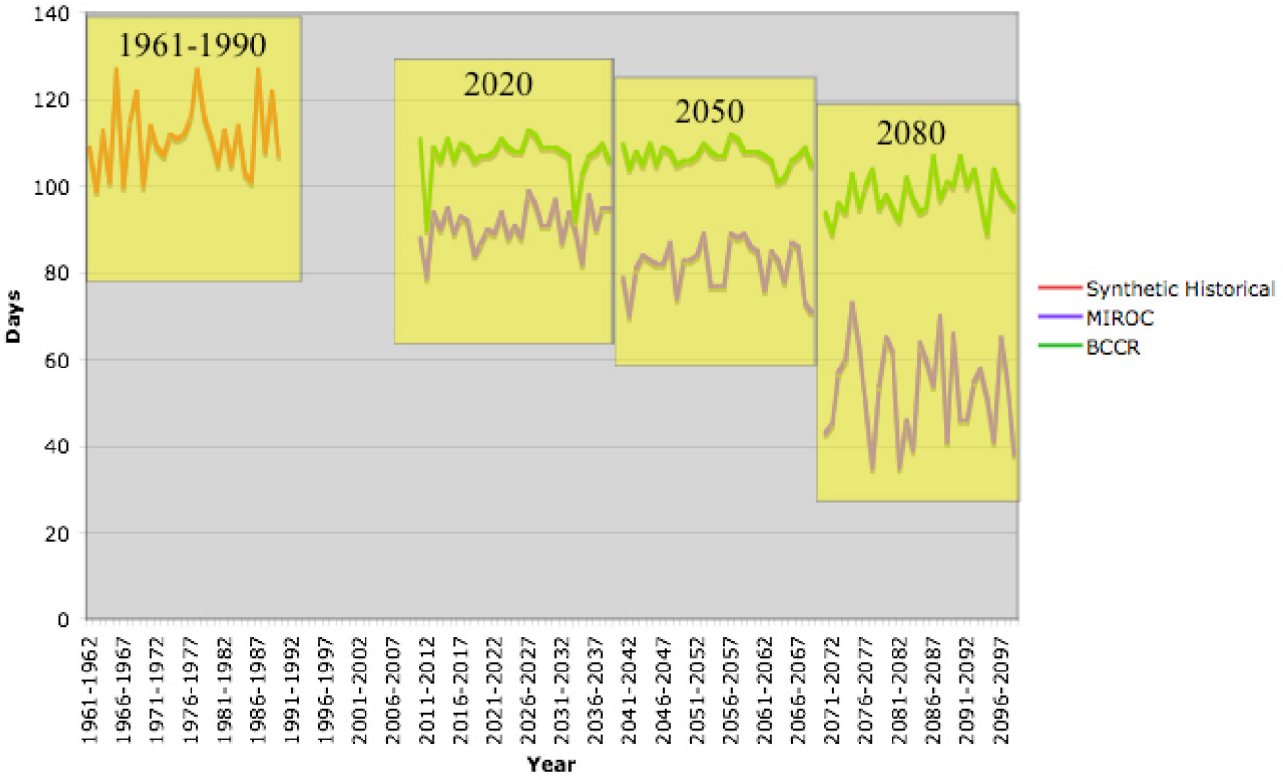
The Snow model uses the output created by the LARS-WG to calculate snow accumulation on the ground. Thresholds are built-in to assess the number of days that are appropriate for skiing and for snowmobiling. The Deer Lake weather station was used for historical weather data. Marble Mountain is one of Deer Lake's nearest recreational and tourist attractions.

Ski Season Projections

For skiing, three categories of slope modification are provided for the projection of appropriate ski days: natural, current, and improved. "Natural" refers to the number of days in a ski season using natural snowfall. "Current" refers to the ski season with the addition of snow making technology. "Improved" refers to the possible lengthening of the season with more advanced snowmaking technology. The findings are summarized below, first in a table of averages and in a more detailed graph with different time slices highlighted.

Table 4.3 Summary of Snow Model Findings (Ski Season)			
Model	Time Slice	Snow Model Category	Average Season (days)
Synthetic Historical	1961-1990	Natural	47.4137931
Synthetic Historical	1961-1990	Current	111.2413793
Synthetic Historical	1961-1990	Improved	132.5172414
MIROC	2020	Natural	31.37931034
MIROC	2020	Current	90.89655172
MIROC	2020	Improved	103.9655172
MIROC	2050	Natural	9.965517241
MIROC	2050	Current	81.65517241
MIROC	2050	Improved	89.51724138
MIROC	2080	Natural	0.448275862
MIROC	2080	Current	53
MIROC	2080	Improved	73.03448276
BCCR	2020	Natural	54.93103448
BCCR	2020	Current	107.2068966
BCCR	2020	Improved	114.7586207
BCCR	2050	Natural	54.20689655
BCCR	2050	Current	107.0689655
BCCR	2050	Improved	115.137931
BCCR	2080	Natural	33.68965517
BCCR	2080	Current	97.93103448
BCCR	2080	Improved	109.1724138

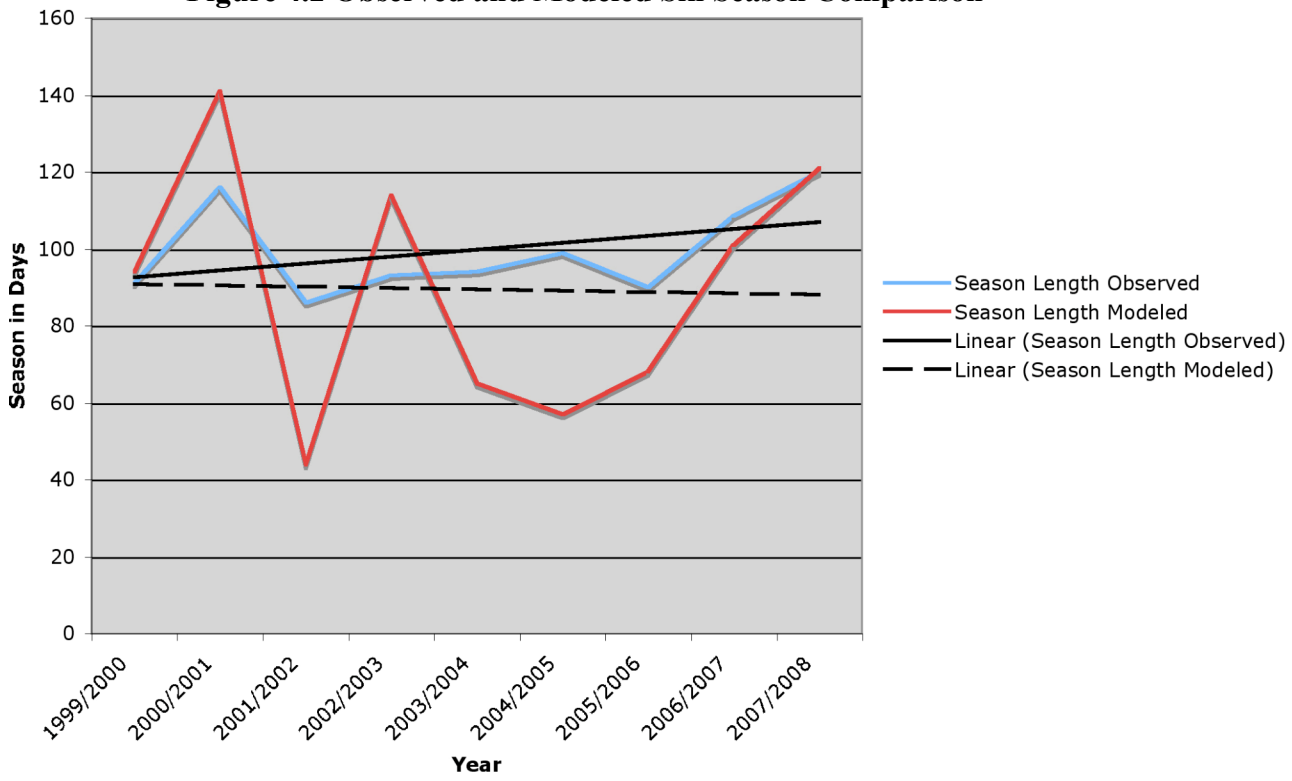
Figure 4.1 Ski Season Projection (Current)



To test the reliability of the Snow Model on Marble Mountain, the Snow Model was run for 10 years, 1999-2008. Marble Mountain general manager Anne Pinsent provided ski visitor data for that same period. It must be noted that this visitor data was not divided into further divisions of local and tourist. Because skiing requires both a base of local users and visitors, isolating either category was not necessary for the goals of this thesis. Below the ski data and the Snow Model are compared. The "Current" category will be used because Marble Mountain has snowmaking capabilities. Below, the information is tabled and graphed.

Table 4.4 Observed and Modeled Ski Season Comparison		
Year	Season Length in Days (observed)	Season Length in Days (modeled)
1999/2000	91	94
2000/2001	116	141
2001/2002	86	44
2002/2003	93	114
2003/2004	94	65
2004/2005	99	57
2005/2006	90	68
2006/2007	108.5	101
2007/2008	120	121

Figure 4.2 Observed and Modeled Ski Season Comparison



Overall, the model successfully simulates the ski seasons for Marble Mountain; however, there are instances in which it over-compensates for strong and poor ski seasons. This is especially evident in the 2001/2002 season, which is the shortest season both modeled and observed. However, the modeled season projects a much shorter season than what

actually occurred. These extreme drops have caused the overall projection to show a slight decrease, when in reality a slight increase in season length is recorded, as shown by the trend lines in Figure 4.2. Despite these spikes and drops, the projections are still relevant because this thesis is using two different GCMs to project a range of probable change. This will compensate for the cases of extreme variation. It should be noted that the modeled season only takes only climate into consideration. Other important variables, such as institutional seasonality, are not taken into account as they are in the observed data.

Another aspect that the Snow Model cannot take into account is how people will react to a shorter ski season. It is possible that a shortened season will have no impact on the overall visitor numbers, provided there are more skiers per day. Using the data provided by Marble Mountain an examination of skiers per season and per day was generated (Table 4.5). From this, it can be seen that season length is not always a determinant of the number of ski visits. The almost steady increase in skiers per season indicates that other variables, perhaps marketing or improved product development, are attracting a growing number of visitors, regardless of season length. This is especially evident when comparing the two longest ski seasons, 2000/2001 and 2007/2008. The latter records only four more days in season length but sees an increase of 7,526 skiers over the season and 56 more skiers per daily average.

Table 4.5 Skier Visits Per Season			
Year	Season (days)	Skiers Per Season	Avg. Skier per Day
1999/2000	91	21,964	241
2000/2001	116	25,567	220
2001/2002	86	21,470	250
2002/2003	93	28,054	302
2003/2004	94	25,341	270
2004/2005	99	28,033	283
2005/2006	90	27,604	307
2006/2007	108.5	35,321	326
2007/2008	120	33,093	276

The projections of the snow model can be considered valid at least as general indicators, especially as the extreme peaks and drops will be compensated for by the use of the two GCMs. The steady increase in visitors, despite varying season and weather, indicated that variables beyond weather are heavily influencing ski visitor numbers. Still, snow cover and appropriate conditions remain the basis for strong ski seasons.

Snowmobile Projections

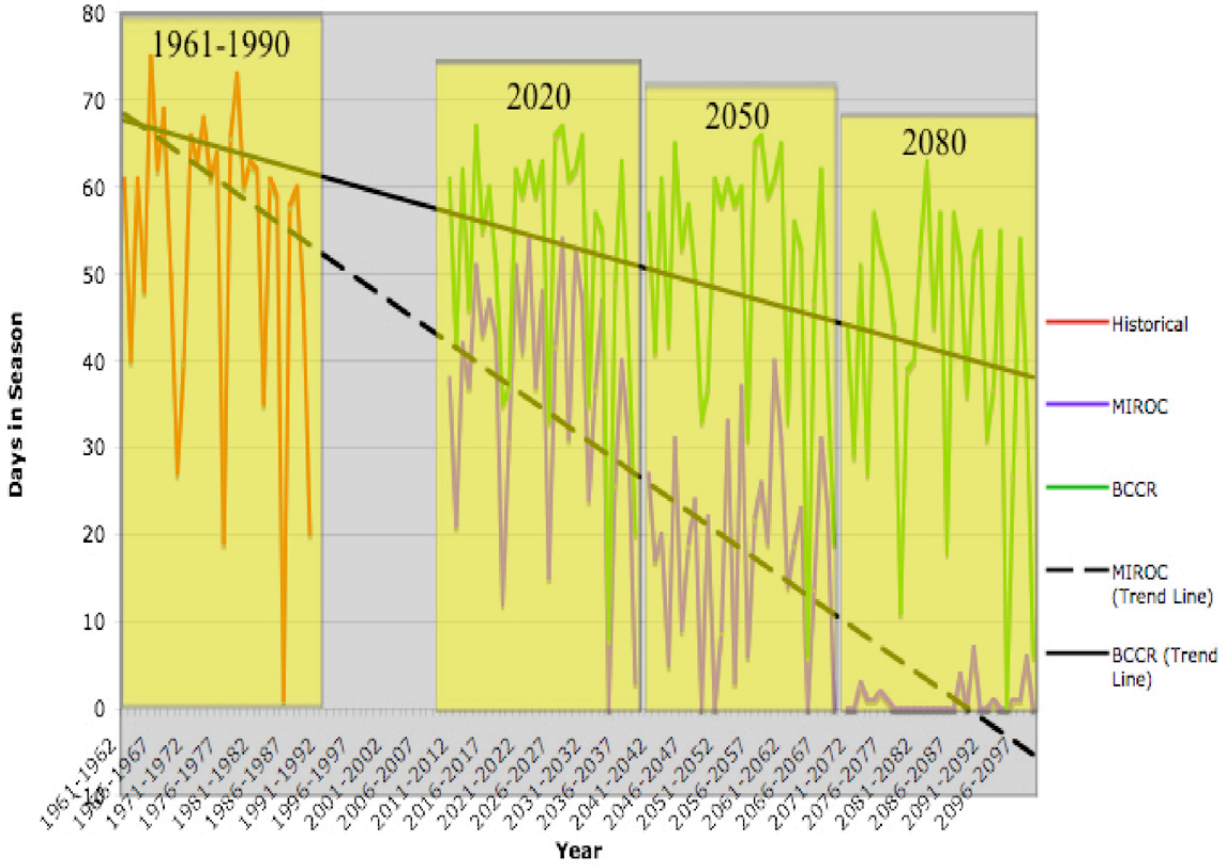
Beyond ski projections, the Snow Model also provides projections for snowmobiling, which is both a popular recreational pastime in Newfoundland and Labrador and also a significant tourism product. The thresholds for this sport are different from skiing, as the heavy machinery involved requires more snow on the ground than skiing. This researcher knows of no adaptation technology that exists to modify the effects of climate change for snowmobiling, as there is for skiing with snowmaking. Therefore the resulting projections are all based on the "Natural" snowfall category of the model. Unfortunately, no data exists that records the number of snowmobile riders, neither locals nor tourists; therefore the snowmobile season analysis is less widely based

than that of the ski season (Penny Brake, personal communication, September 19, 2008). The following table (Table 4.6) displays the average snowmobiling season length projections of the Snow Model.

Table 4.6 Summary of Snow Model Findings (Snowmobile Season)		
Model	Time Slice	Average Season (days)
Synthetic Historical	1961-1990	53.06896552
MIROC	2020	36
BCCR	2020	51.93103448
MIROC	2050	18
BCCR	2050	50.20689655
MIROC	2080	1
BCCR	2080	40.62068966

Below is a more detailed view of these same results graphed. The black trend lines are intended to present the most likely range of change in the snowmobile season, based on the Snow Model projections.

Figure 4.3 Snowmobile Season Projection (Natural)



The two GCMs provide diverging projections. MIROC forecasts that the snowmobile industry in western Newfoundland will be significantly shortened by the 2050s and essentially non-existent by the 2080 time slice. Under the BCCR scenario, snowmobiling can continue throughout the century, although under a shortened season and with greater uncertainty. Despite the range provided, both GCMs expect the snowmobile season to shorten throughout the century.

4.2.3 Golf Model

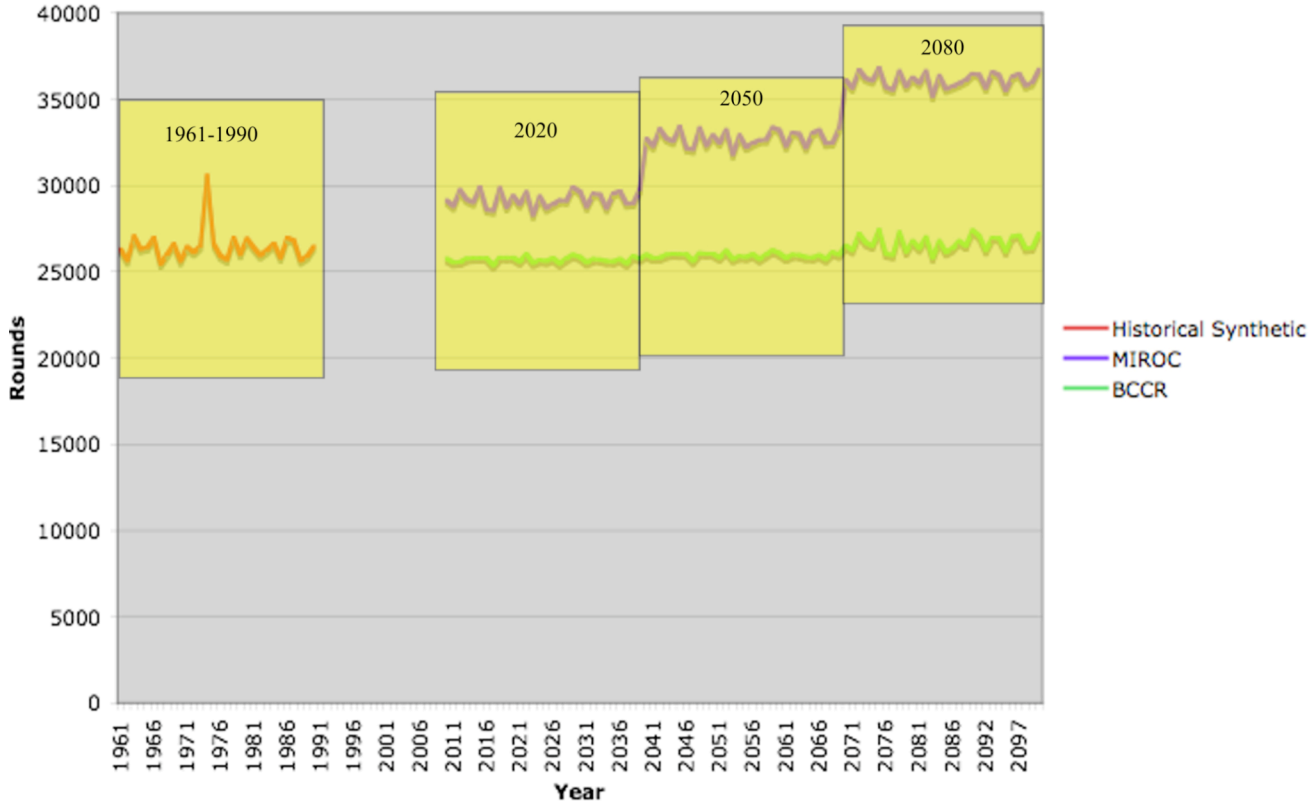
The Golf Model used in this thesis employs temperature and precipitation to project suitable days for golf. Thresholds are set to ensure a number of consecutive days of golf weather occur before projecting golf rounds. This ensures that, for example, an unseasonably warm December day is not projected as a day of golf. This threshold is also realistic in that it takes into account time required by course operators to prepare for their seasons and time for the ground to dry. Thirty-two degrees Celsius is the cap for temperature before it negatively affects the number of golf rounds. While golf needs warm weather, when it becomes warmer than 32 ºC fewer golfers will play. The model was calibrated to a golf course in Cape Breton (Scott and Jones, 2007), as no courses in Newfoundland and Labrador were willing to provide visitor data. As Cape Breton and Newfoundland are comparable geographically, socially, and economically, the model is expected to perform well. However, without observed visitor data, it is not possible to assess the performance of projections against real numbers, as was done with the Snow Model.

Greg Hillier, executive director of Golf Newfoundland and Labrador, provided an estimate for the average amount spent by a golfer in Newfoundland and Labrador including, gas, meals, and green fees (Greg Hillier, personal communication, June 16, 2008). Using this, an estimate of the economic impact of climate change for the golf industry can be made. Below is a summary of the Golf Model findings combined with an estimate of their economic impact.

Table 4.7 Summary of Golf Model Findings				
Model	Time slice	Projected Rounds (34 week season) Averaged	Average Golfer Expenses (estimate per round)	Revenue Generated (estimate)
Synthetic Historical	1961-1990	24,934	$ 90	$ 2,244,060
BCCR	2010-2040	25,710	$ 90	$ 2,313,900
BCCR	2040-2070	25,944	$ 90	$ 2,334,960
BCCR	2070-2099	26,650	$ 90	$ 2,398,500
MIROC	2010-2040	29,198	$ 90	$ 2,627,820
MIROC	2040-2070	32,733	$ 90	$ 2,945,970
MIROC	2070-2099	36,119	$ 90	$ 3,250,710

The extreme warming scenario seen in the MIROC32_hires A1B-run1 allows for a more economically viable golf season, with an increase near 45%. Although the MIROC32_hires A1B-run1 did project a slight increase in precipitation, the warming temperature outpaces it and allows for more rounds of golf to be played. This model predicts a steady increase in rounds played across all three time slices. On the other hand, BCCR-BCM20 B1-run1 projects a lower number of rounds play than MIROC32_hires A1B-run1. BCCR-BCM20 B1-run1 projected a slight increase in warming and a decrease in precipitation. Despite the lower number of rounds projected than the warmer GCM, there is still an increase across all three time slices. The following graph (Figure 4.4) presents a more detailed picture of the same information.

Figure 4.4 Golf Season Projections



The cooler scenario does not project a major shift from the current participation rate. Yet, the warmer scenario projects a substantial increase in the potential number of rounds played. This could result in the development of more golf courses in the region or greater revenues for the existing courses.

Summary

The findings from all the models provide a relatively broad range of projections to compensate for the highly unstable variability of seasonality. Despite the divergence in the warming projections of the two GCMs, both do predict warming. While this could be taken to mean that winter tourism will suffer at the expense of warmer weather tourism,

the Snow Model has shown that skiing can continue using the adaptation of snowmaking. More important is the shifting shoulder season. The models have shown that as one tourism attraction declines, another attraction gains. Analyzing the trends and planning accordingly allows for the best adaptation practices. The following chapter will assess how these projections come together with the qualitative findings.

CHAPTER FIVE: ANALYSIS AND RECOMMENDATIONS

5.1 Analysis

This chapter will interpret the significance of the research findings concerning climate change and tourism in western Newfoundland. The research question and the objectives will be reexamined in the context of the findings. The central question, as presented in the first chapter, is: what are the potential impacts of climate change on the tourism industry of western Newfoundland? The following three objectives have been developed to help answer this question:

1) To understand the policy direction of the tourism industry in western Newfoundland;

2) To project a probable range of change in western Newfoundland's climate;

3) To integrate the policy direction and climate projection with the intention of identifying opportunities and challenges.

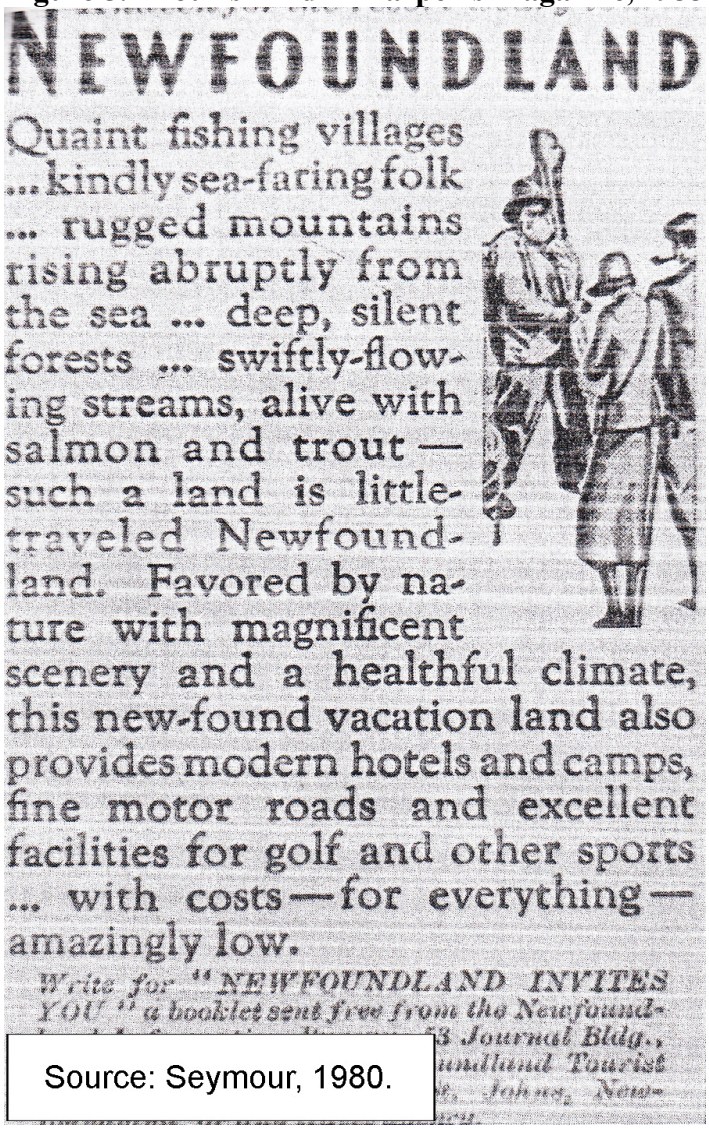
1) To understand the direction of the tourism industry in western Newfoundland.

The interviews and document analysis achieved this objective. There is a general desire to attract more tourism development and growth in the industry. Most interview participants felt that there was a need for more accessibility and marketing. This indicates that there is a desire for more tourists. This is to be expected; it is normally the goal of all tourism destinations. However, it is less clear if there are plans in place to deal with a larger influx of visitors.

The Director of Tourism Product Development explained that Newfoundland and Labrador's small-scale position in the global tourism market attracted "the right tourists" (Juanita Keel-Ryan, personal communication, October 31, 2008). This slow growth allows tourism planners the time to prepare and react. On the other hand, the goal of the operators is to attract more people. It is unclear how compatible these two policy approaches are. It is also unclear if there has been substantial preparation and planning for the possible growth to large-scale tourism in Newfoundland and Labrador.

The common ground between those hoping for slow and steady tourism growth and those looking to expand quickly is that both want growth. The approach for attracting more people remains constant and the marketing thrust of the tourism industry in Newfoundland and Labrador has not changed significantly over time. As the advertisement below (Figure 5.1) from 1933 reveals, the tourism industry has long relied on its culture, the "kindly sea-faring folk," as well as its geography, "with magnificent scenery and a healthful climate." These were the same two attractive features that the interview participants identified as Newfoundland's greatest assets. This is not to criticize the slow evolution in marketing techniques, but rather to bring attention to the longstanding importance of the natural features to the Newfoundland tourism industry.

Figure 5.1 Tourism Ad in Harper's Magazine, 1933



Source: Seymour, 1980.

While the qualitative portion of this study discovered forthcoming projects to better protect natural resources, there was little evidence of implementation. Implementation is a subject of Baer's plan critique, used in this thesis, and a lack of it can be indicative of poor planning or a lack of political will to act on proposed plans. In western Newfoundland there is one major exception to this, Gros Morne, which as a UNESCO World Heritage site and National Park has experts and scientists monitoring

and projecting the impacts of climate change on the natural systems of the park. One of these experts, Dr. Norm Catto, of Newfoundland and Labrador's Memorial University, has also done a great deal of work on coastal erosion, which can have a negative impact on tourism sites. An exhibit of the potential impacts of climate change on tourism in Gros Morne was on display during the site visits performed in the initial stages of this thesis. Gros Morne is also an exception in the sense that, as a national park, it is federally funded and managed, while this thesis has largely focused on provincial policies. Nevertheless, this study has found little in the literature, official documents, or interviews that demonstrates that climate change is an issue of primary concern for the tourism industry. Obviously, the natural features of Newfoundland and Labrador, and especially western Newfoundland, are important as tourism resource. Proper monitoring of these features should be developed to aid in necessary adaptation strategies with climate change.

Tourism Product Development Officer Andy Hennebury lamented in his interview that there is little technology used in the tourism industry. He also explained that there is a lack of base level data being collected, a sentiment echoed by Newfoundland and Labrador Snowmobile Federation director Penny Brake. Baseline data is important in monitoring a number of developments, including the affect of tourism on its host area and the impact of climate change on regions and systems involved with tourism. Collecting data and monitoring change are essential to impact assessments on climate change.

The documents, interviews, and literature have identified geography and culture as Newfoundland and Labrador's defining tourism products. Promoting these features is part of the province's direction with the tourism industry. It is important to note that one

of these tourism pillars, its people and culture, is facing substantial pressure from the collapse of the fisheries and the resulting economic restructuring. The recent increase in offshore oil production is expected to bring new levels of revenue to the province. Nevertheless, it is part of the economic and social restructuring. Should climate change significantly affect the natural systems (i.e. water, coastal topography, etc.) to such a degree that it is stressed, both these main pillars could face major challenges in the coming decades.

2) To create projections of a probable range of change in western Newfoundland's climate.

The temperature projections of the LARS-WG provided a range that diverges over time. This is useful as the growing range compensates for extreme variations. The projections are applicable in short, medium and long range planning. A more detailed summary can be found in Table 4.2. Below, the table displays the range of the projected annual averages.

Table 5.1 Divergence in LARS-WG Annual Average Projections

	Model	BCCR-BCM20 B1-run1	MIROC32_hires A1B	Difference
Time slice				
2020		4.511468184 ºC	6.713189382 ºC	2.201721198 ºC
2050		4.675292843 ºC	8.826270719 ºC	4.150977876 ºC
2080		5.284224803 ºC	11.20746148 ºC	5.923236677 ºC

Even an increase in the short term of 4.5 degrees to 6.7 degrees Celsius could alter travel patterns. The rising temperature through the century could change many tourism products in western Newfoundland.

As explained in the literature and through interviews, seasonality is an issue for the tourism industry. One of the current solutions is to promote a two peak tourism market. In this vein, Marble Mountain Resort has been searching for summer tourism attractions to keep revenue flowing year round. The zip-lining company that was recently set up on the mountain is the latest venture in this regard. Another solution to seasonality is the coordination of shops and attractions to remain open outside the traditional summer peak. This was recently piloted successfully by the Department of TCR.

The results from LARS-WG suggest that seasonality may be further compounded in western Newfoundland by global warming, as warmer summers and warmer winters could increase the difference between high season (July and August) and the secondary peak (winter months). In this case, the peak summer season would become more attractive, while the winter months, with declining recreational activities, would become less attractive. Still, this increase in warmer summers could also lengthen the peak season and offset the winter losses. Many interview participants believed that global warming would be an advantage to western Newfoundland's summer tourism. This may indeed be the case, as the annual synthetic historical (1961-1990) weather created by LARS-WG averaged a relatively low 4.1 ºC and can absorb a level of warming. This allows for global warming to take place without bringing summer temperatures to uncomfortable or unhealthy levels, as it may in other parts of the globe. The attractiveness of the cooler western Newfoundland climate may increase as resident and tourism locations in other parts of the world become less comfortable.

The use of the two recreation models, snow and golf, allows for more specific impact assessments. The tourism industry of western Newfoundland has a great deal

more to offer than golf, skiing, and snowmobiling, however an examination of these three recreational activities will give an indication as to how global warming will impact the industry.

The Snow Model provided projections for both skiing and snowmobiling. The results for skiing will be analyzed first. Using the "Current" category, the Snow Model projected a steady decline in number of days per ski season. Under the BCCR scenario, the "Current" category projects 98 ski days per season in the 2080 time slice. This season length is on par with the season length of the observed past 10 seasons, which fell just below a 100 day average. However, this is lower than the modeled historical data, which averaged 111 days. Under the BCCR scenario, skiing could continue at Marble Mountain with slightly shortened seasons and increased reliance on snowmaking technology.

MIROC, the warmer model, sees more severe season losses by 2020, the season is reduced to 91 days, and by 2050, down to 82 days. These season lengths, though shortened, are similar to recorded recent seasons. This indicates that skiing could still operate in the short and medium-term. However, MIROC projects a much shorter season, 53 days, under the 2080 time slice. This would be substantially lower than the even shortest season in the past decade (86 days) and the decade's 100 day average. The observed data from 1999/2000 to 2007/2008 (Table 4.5) indicates that the average number of skiers per day is 275. Using this figure as a guide and combining it with the MIROC 2080 projections indicates only 14,575 skiers in a 2080 time slice season. This figure is less than half of that of the most recent season (2007/2008). It is unlikely a ski resort could remain profitable on such a reduced number of season days and tourists. There are possible adaptations. Should advancements in snowmaking technologies be

made at Marble Mountain, the Snow Model projects an average season length of 73 days (using the "Improved Category" in Table 4.3) under the 2080 timeframe. This would likely provide a season length that would be financially viable.

The indicator of profitability would normally be used in a projection such as this; however for the provincially owned Marble Mountain the situation is more complicated. Generally, the European style 100 day rule (Konig and Aberg, 1997), which requires a ski season to extend over 100 days to be profitable, would be used as a basic guide. However, observed data provided by General Manager Anne Pinsent has shown that Marble Mountain has had seasons as long as 120 days and as short as 86 days in the past 10 years but has never met its expenditures through revenue. The province funds the crown corporation to cover the shortfall. As explained previously, the ski resort was created by the provincial government to act as a tourism anchor for the western region of Newfoundland. Therefore independent profitability is not the primary goal, though it is likely still a goal. So long as spin-off revenue, at nearby accommodations, restaurants, sports stores, etc., is generated, the resort is considered successful. Nevertheless, it can be assumed that without skiing, the tourism anchor would not produce spin-off tourism development in the area. Therefore, if Marble Mountain were to operate under a shortened season, winter activities beyond skiing would need to be developed. Recreational products such as cross country skiing, zip-lining, winter camping are all types of recreational activities that take place in western Newfoundland that do not directly pertain to skiing. Snowmobiling is another important recreational activity and it will be analyzed in the following.

The Snow Model projects a baseline (1961-1990) of 53 days for a snowmobiling season. The interviews established that snowmobiling is a popular recreational and tourism activity, especially in western and central Newfoundland. There is no available data on the number of snowmobile riders or the season length in western Newfoundland, but Scott, Dawson, and Jones (2007) consider a season of 50 days and above to be normal. With this as a reference point, the two GCM projections will be investigated. The cooler BCCR scenarios show averages of 52, 50, and 41 days in the time slices 2020, 2050, and 2080 respectively. While the 41 day season is below the point of reference, it does allow for a considerable amount of snowmobiling to be done.

The MIROC scenarios show a much more drastic reduction in snowmobile season length. With projections of 36 days in 2020, 18 days in 2050, and 1 day in 2080, the snowmobiling industry is severely diminished in the short term and essentially non-existent by the 2040s and beyond. Under this GCM, snowmobile riders would be forced to use different machines, perhaps four-wheelers, or ship their snowmobiles to more northerly areas with more snow. There would be no tourism attraction in the western Newfoundland involving snowmobiling under this projection.

The long-term projections of these models expect that skiing and snowmobiling will be limited, if not eliminated, by the warming climate. Without these major snow related activates, winter tourism in western Newfoundland does not have many options. Cutting government investment in snowmobile trails and grooming is an option, should the activity become impractical. A ski resort that is not profitable currently is not likely to generate more revenue under a shortened ski season. Still there is a possibility that Marble Mountain will become a more attractive ski destination relative to other ski areas

that are more vulnerable to climate change. Anne Pinsent indicated that reduced season length in the Alps has helped attract European skiers to Marble Mountain. In addition to this, other studies have projected reduced season lengths for other ski resorts (Scott, Dawson, and Jones, 2008; Scott, McBoyle, and Minogue, 2007; Scott, McBoyle, Minogue, and Mills, 2006). If Marble Mountain is less affected by the climate warming, it may gain from a reduction in competition. Other interviews have revealed that the Department of TCR does not market winter tourism effectively. It is not advertised as widely as summer tourism and few of the many winter products are marketed. Often cultural tourism is marketed instead of recreational tourism in the winter, which draws tourists towards St. John's and the east of the island where many cultural attractions are found. It may be too late to begin building a substantial consumer base of winter tourists if global warming reduces the attractiveness of the product.

The Golf Model provides projections for a popular summer tourist and recreational activity. Beginning with the synthetic historical baseline of 24,934 rounds per year, both GCMs project steady increases in the potential number of golf rounds per season. Under the BCCR scenario, which projected a gradual increase in temperature, golfing increases 1,716 rounds by 2080 from the baseline. The MIROC scenario projects a much higher increase, 11,185 in playable rounds by the 2080s, which is a 45% increase over the baseline. These numbers would suggest golf is a tourist activity that western Newfoundland can expand.

Western Newfoundland possesses wide-open spaces, scenic terrain, and a rugged topography. These types of aesthetic tourist attributes can be readily adapted to enhance golfing. Scenery is important in developing uniqueness among courses. The vast amount

of crown and undeveloped land allows for further golf course development. However, there still needs to be a solid customer base made up of locals to use the courses outside of the high tourism season. This local base may be enhanced by the fact that the population of Newfoundland and Labrador is aging (see Table 2.1 and Figure 2.1). Golf is a sport that can be played by participants of all ages. If the climate in western Newfoundland warms, it could expand the shoulder seasons of its golf season, the times before and after the peak tourist season. Golf is a sport that can begin earlier in the spring and be played into the fall, if the climate warms to allow for this.

The use of two GCMs has provided a diverging range of projections for both winter and summer tourism activities. While this makes recommendations more difficult, as the models are not specific, the trends can still have for some usefulness. Under both the warmest and coolest projections, snowmobile and ski seasons are expected to shorten. Under both scenarios, golf seasons are expected to lengthen. Therefore the overall impact climate change has on tourism can be managed by a shifting of season lengths.

3) To integrate the policy direction and climate projection with the intention of identifying opportunities and challenges.

The main finding of the qualitative research was that geography was one of the two main tourism products of the tourism industry. The central finding of the quantitative portion of this study is that global warming will impact the nature-based recreational activities that were examined. The overlap between the two methods illustrates the importance of western Newfoundland's natural attributes. These attributes are the basis for skiing, snowmobiling, and golfing. The models used in this thesis find that these

attributes are vulnerable to climate change. There are no findings that indicated that the tourism industry is monitoring these changes so that it can act accordingly. The results of this thesis would suggest that these changes be monitored and planned for.

The conclusion that the natural resources of Newfoundland and Labrador are important to the tourism industry is expected. However, that these resources have breaking points should be more of a concern to the provincial government. Like the aforementioned caribou hunt that decimated herd numbers and alienated locals and the collapse of the cod industry, possibly due to over fishing or even climate change (Drinkwater, 2005), the losses of natural resources is damaging to the province. These tourism-related geographical resources require more research and data collection to ensure their protection. Mr. Hennebury explained that tourism operators do not realize the value of their own natural assets. He went on to suggest that these operators should act as advocates for their environment, benefiting their own businesses and the province as a whole. Tourism can be sustainable, but only through attentive effort.

The qualitative portion of this research has discovered a lack of concern for potential impacts of climate change. The quantitative research has revealed an industry threatened by warming winters in snowmobiling, a golf industry that may see opportunities in longer seasons, and a ski industry that can maintain a slightly diminished tourism product with adaptation strategies. All three of the tourism industries show that they will be affected by global warming. Pro-active planning can turn that into an advantage, in the case of golf. In the case of skiing, adaptation strategies, perhaps in the form of improved snowmaking abilities, are required to maintain the current season length. Snowmobiling is projected to be a threatened industry. Research is needed to

recognize the degree of loss that snowmobiling faces. Also research needs to be done to replace this industry or to adapt it.

This thesis has provided a range of projections for skiing, snowmobiling, and golf. The ranges vary, but all project change. Golf Newfoundland and Labrador executive director, Greg Hillier, is currently profiling the golf industry. More frequent industry profile updates will allow for a more accurate forecast of the development of the golf industry. The findings of this thesis suggest that further expansion is possible. Penny Brake laments the lack of data collected on the snowmobile industry. This thesis projects a severe decline in appropriate snowmobiling days. Data collection needs to begin as soon as possible before the decline makes information on the snowmobiling industry irrelevant. The ski industry and Marble Mountain appears safe. While the climate projections do not favor natural snowfall, adaptation is possible. In addition, the provincial financial backing can allow for the implementation of these adaptation strategies.

The potential impacts of climate change on tourism in western Newfoundland range from negative, to neutral, to positive. The research question is answered in that there are potential impacts. How they will be acted upon, remains to be seen. The combining of the qualitative study, which found indifference to global warming in the tourism industry, and the quantitative study, which projects a range of positive and negative changes in the tourism industry, indicates a gap between the two. The following recommendations are intended to help bridge the gap concerning the two methodological results.

5.2 Recommendations

This thesis recommends that more information collection and research on the potential impacts of climate change on tourism in western Newfoundland be done. This recommendation is applicable beyond the tourism industry and beyond western Newfoundland, as many different industries and communities throughout the province could face various impacts. However, tourism is one of Newfoundland and Labrador's most important industries and its reliance on natural features in western Newfoundland increases its vulnerability to climate change. Therefore, this thesis has highlighted an area that requires more study and monitoring.

While important, tourism is an unconventional industry in that it does not, at least in Newfoundland and Labrador, provide year-round employment. Job creation has been identified as a major issue in Newfoundland and Labrador. Attracting tourists throughout the year creates more reliable jobs. Climate change can shift the tourism season and thereby shift the length of available work. A longer summer allows for the current work situation to be extended. However, a reliable winter and summer tourism season, with viable shoulder seasons transitioning from one to the other, can allow for four-season employment. It is in Newfoundland and Labrador's best interest to study the shifting tourism season to maximize potential job creation.

Shoulder seasons are important in keeping a tourism sector running between the major and minor tourist peaks. As revealed in the interviews, the Department of TCR is already piloting programs to coordinate the extension of the tourism season. Weather willing, the golf sector is an area that this same type of program can be applied. The results of the models suggest that the climate will allow for longer seasons. This golf

season expansion may be necessary to compensate for the projected losses of the ski and snowmobile sectors. The extension would need coordination with other recreational activities, which would be similar to the season extension program currently being piloted. Courses in and around Gros Morne would most likely be the most viable place to test a coordinated extending of the golf season.

Andy Hennebury explained that the Department of TCR does not utilize technology to its full potential For instance, he noted that by creating a map-based database of the natural resources of Newfoundland and Labrador, more effective work could be done to promote the areas of tourism destinations and avoid their privatization or loss. The results of this thesis support his assertion that more technology and information collection is necessary to examine changes in and around the industry.

Mr. Hennebury also explained that an interdepartmental group was being created to deal with environmental issues including climate change. This thesis recommends that this group provide a framework for greater data collection for the purpose of monitoring these changes, especially climate change. For example, annual or seasonal data collection does not allow for the affects of seasonality to be examined. In order for the effects of seasonality and climate change to be measured, comparable datasets are required. In addition to this, a more specific time series (i.e. monthly or weekly) is recommended, as advocated by Baron (1975). This information will aid in understanding the shifts in the tourism seasons and provide data to base appropriate actions upon. As one of the findings of this thesis was that the tourism industry is structured from the top down, the distribution of a comprehensive framework for information collection should be readily implemented.

Penny Brake believes more data collection needs to be done on the snowmobiling industry, something that is supported by this thesis. Though the models project snowmobiling will not last the century, it is important to monitor how the season is shrinking rather than simply letting it disappear. More accurate models and more detailed findings can be created with better information. The impact this will have on local recreational riders and tourism numbers is also important to record. This thesis would suggest that work also be done to identify other complementary attractions that can replace snowmobiling or supplement its losses. An extension of the four-wheeling season along the same trails, to take advantage of the less snow is a possibility. Restrictions on the weight of snowmobile on the trails, which would require a lower snow base is another suggestion. Restricting snowmobiling to areas of higher elevation, and more reliable snowfall, is also possible. Other adaptations strategies need to be explored.

The Department of TCR does collect visitor information through surveys and has a good deal of economic information on its website. It also closely monitors how visitors arrive on the island of Newfoundland, whether by air, car (via the ferries), or by cruise ship. The information is, no doubt, important in establishing tourist trends and making projections. However, the information is not collected as rigorously in every tourism sector. It is recommended that the Department of TCR create a data collection framework that is applicable to several tourism industries. This would also allow for the examination of tourism trends. It would help officials to better understand what visitors are doing and how they are spending their money when traveling Newfoundland and Labrador. Such a framework would also lend itself to this study. Comparable datasets would allow for the affects of changing season lengths to be expressed in numbers of visitors and dollars.

This type of data would make a more compelling argument to both policy makers and the public. This study recommends that such a framework be piloted with the recreation sector before moving to other tourism areas.

This thesis has provided a range of projections for skiing, snowmobiling, and golf. The ranges vary, but all project change. With the exception of the interdepartmental forum for environmental issues, there is no entity within the provincial government that has addressed these potential changes. Although climate change will not have the impact on Newfoundland and Labrador that it is projected to have elsewhere, it is still important that there is planning in this matter.

The LARS-WG model and the golfing and snow model that used its data create projections in three time slices. Therefore, the following recommendations will address the short, 2020, medium, 2050, and long-term, 2080, time frames. In the short term, the degree of change is small enough that winter tourism can be marketed along the same lines as it is currently. However, preparation should be beginning to create alternative recreational activities for the medium and long-term winter activities. In the medium-term, the snowmobiling industry will be affected to such a degree that alternative activities will be necessary immediately to maintain the current levels of tourism traffic. Skiing cannot be expected to accommodate this surplus of demand for winter recreation solely, as it will be operating under a slightly diminished season. In the long-term 2080 time slice, snowmobiling will effectively be defunct and skiing will be operating with a further shortened season.

Looking back to the document analysis, The Economic Planning Group of Canada (1996) created an assessment report aimed at winter tourism activities. Consideration

should be given to the activities suggested by the report: winter camping, hiking, snowshoeing, cross-country skiing, and dog sledding, as alternatives to assist the heavily shortened snowmobile season. Ice fishing, extreme snow sports and indoors attractions can be added to the list of alternative activities. Hiking, snowshoeing, cross-country skiing, and dog sledding are all activities that can make use of the T'railway that is currently used for snowmobiling. However, infrastructure along the trail system would need to be altered. These other activities do not cover the same distances as snowmobiles and would require rest areas and access points for vehicles. These activities are less vulnerable to warmer winters and less snowfall. In the long-term, a variety of winter recreational interests will need to replace the snowmobiling tourism product and supplement the lost days in the ski season. Several of the suggested activities of The Economic Planning Group of Canada do not require a reliable amount of snow; these would be less vulnerable to climate fluctuations. The four-season zip lining attraction on Marble Mountain is a successful example of how to diversify attractions.

The golf industry is projected to gain longer golfing seasons. Without knowing tourism data for the snowmobiling season, it is not possible to project if this increase will offset the loss the snowmobile industry is expected to incur by the 2080s. Still, it can be assumed that this increase would at least lessen the economic impact. The projections expect a steady growth in season length through all three time slices. The BCCR model calls for a lower degree of change than the MIROC model, which projects more than a third increase in season length. Expansion of the current courses should be prepared for the short-term. In the medium and long-term, new courses should be developed to take advantage of the extended season. Because accessibility will still be an issue, working

with the tourism industries of the Atlantic Provinces may be an advantage. Creating a regionalized golf destination with the provincial competition of Nova Scotia and PEI is also recommended in the medium to long-term.

Should the expansion be successful, other recreational attractions can tag on. Camping and hiking in Gros Morne are already popular activities. Fishing and hunting are activities that can take place in the same season as golfing. Four-wheeling can replace snowmobiling as a rural form of transportation. Summer attractions, such as sightseeing boat cruises and deep-sea fishing, are well established in the eastern area around St. John's and so activities suitable to the uniqueness of the west are proposed. Cultural attractions can still be a vital part of the western tourism scene and should remain as such. Golf course expansion may allow for more forums to display Newfoundland culture through art and music.

The findings of this thesis point towards several broad recommendations. Firstly, projected climate change will be an issue for the tourism industry of western Newfoundland. It is recommended that a more robust and better-resourced study investigate these findings. Next, the lack of tourism related data has made drawing conclusions for this study difficult. Such information is necessary in order to monitor how the tourism industry is impacting its environs (socially, environmentally, etc.) and how the industry itself is being impacted by the greater forces of change (global economy, climate change, etc.). It is essential that this information be collected in a manner that makes it comparable across the industry. More proactive planning in all three of the tourism industries examined is also suggested. Marble Mountain is the only sector studied that had a tourism plan in place. Golf Newfoundland and Labrador is in the

process of creating an industry profile and the snowmobiling industry does not have an industry plan. Informal conversations revealed that there is a winter tourism strategy under development by the Department of TCR. As it has not been released, this thesis cannot review it. The western Newfoundland tourism industry has room to grow and expand. Planning and monitoring is necessary to ensure that it grows in a sustainable manner and adapts to large-scale changes that can be both threats and opportunities.

5.3 Areas of Further Study

This thesis narrowed its scope to western Newfoundland. Other areas of Newfoundland and Labrador can benefit from this type of analysis. Many interview participants believed Labrador could be the next tourism product from the province. As a northern region with a cold climate, examining the potential climate impacts would be prudent. The coastal regions and coastal communities would also benefit from a climate impact analysis.

The Golf Model used in this thesis relies on both visitor information and climate information. This thesis was able to provide only climate information and had to rely on the visitor data of a Cape Breton golf course. While this was useful, the application of this same model using actual western Newfoundland golf course data would provide for more accurate and useful results. The forthcoming industry profile may also have data that could have been incorporated into the model.

Ideally, this thesis would have followed a more detailed design and studied more tourism industries in western Newfoundland. Preferably, the study would have included snowmobiling and skiing in the winter as well as golfing and camping in the summer,

which would have given the research a year-round range. By studying these four major tourism industries, the shifting seasonality may have been better understood. The projecting of the expansion or contraction of the shoulder seasons could have been enhanced. There were several setbacks that prevented this ideal study from being realized. Snowmobiling lacks the data necessary for this study; however, there is a clear demand for this information from those in the industry. The golf industry should realize it is in their best interest to provide visitor information for the benefit of research. Finally, the camping data lacked year-round monthly or weekly breakdowns needed for it to be compatible with the other data sets. The Marble Mountain data was useful but a more in-depth analysis could have been undertaken with the addition of financial information. With more resources and time, this ideal project could have analyzed the shifting tourism seasons, which industries stood to gain or lose, and the economic impact of these shifts. This study has indicated that the Newfoundland and Labrador tourism industry will be affected both positively and negatively by climate change; more research on this topic would help minimize the risks and maximize the opportunities.

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APPENDICES

A-1 Example of Guide for Interviews

Sample Open-ended Interview Guide

1. How important do you consider the tourism industry in relation to the economic vitality of Newfoundland as a whole?
    a. Does tourism create job opportunities for locals?
    b. How much revenue is generated by tourist activities?

2. Should tourism destinations strive to lengthen their tourism season as long as possible?
    a. Is season length an issue?

3. Does weather play a role in tourism activities?
    a. Do rain and fog hinder certain events or attractions?
    b. Would a longer warmer summer impact the tourism sector?
    c. How do travelers to Newfoundland react to adverse weather conditions?

4. What is the greatest obstacle facing the future of the tourism industry?
    a. Why?

5. What is the greatest opportunity facing the future of the tourism industry?
    a. Why?

6. Will the current oil boom have any affect on the tourism industry?
    a. Examples?

7. In your opinion, is climate change/global warming an issue that the tourism industry needs to take notice of?
    a. Do you see this as a threat to the industry or as an opportunity?
    b. Specifics?

8. Are you in agreement with the direction of the tourism department?
    a. Examples?

A-2 Example of Information Letter and Consent Form for Interview Participants

This letter is an invitation to consider participating in a study I am conducting as part of my Master's degree in the School of Planning at the University of Waterloo under the supervision of Professor Robert Shipley. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part.

Over the years, the tourism sector has played a significant role in the economic development of Newfoundland. Issues of climate and seasonality are closely linked to the tourism market and are of increasing importance as global temperatures rise. Despite this link, little work has been carried out in forecasting potential opportunities and benefits offered to the tourism sector through a changing climate. The purpose of this study, therefore, is to determine the potential impacts of climate change on the tourism industry of Newfoundland.

The interview section of this study will focus on determining the current and future direction of the tourism industry. I believe that because you are involved in the tourism sector, you are best suited to speak to the various issues, such as tourism planning, seasonality, and the future if this industry.

Participation in this study is voluntary. It will involve an interview of approximately 20 minutes in length, although this depends on the interviewee's interest in the project. The interviews are to take place in a mutually agreed upon location. An open-ended interview guide may be provided beforehand, should you request it. You may decline to answer any of the interview questions, if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. All information you provide is considered completely confidential. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used. The interview will not be recorded by either video or audio. The name of the locations (ie: Marble Mountain, St. John's, etc.) will be used in the thesis. Data collected during this study will be encrypted and kept on my person at all times for the three weeks that I am in Newfoundland and retained indefinitely in a locked office in my supervisor's lab upon my return to the University of Waterloo. Only researchers associated with this project will have access. There are no known or anticipated risks to you as a participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at 1-519-954-0931 or by email at jcduff@uwaterloo. You can also contact my supervisor, Professor Robert Shipley at (519) 888-4567 ext. 35615 or email rshipley@fes.uwaterloo.ca.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes of this office at (519) 888-4567 ext. 36005.

I hope that the results of my study will be of benefit to those tourism organizations directly involved in the study, other tourism organizations not directly involved in the study, as well as to the broader research community.

I very much look forward to speaking with you and thank you in advance for your assistance in this project.

Yours Sincerely,

Jordan Duff

Student Investigator

CONSENT FORM

I have read the information presented in the information letter about a study being conducted by Jordan Duff of the School of Planning at the University of Waterloo. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at (519) 888-4567 ext. 36005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

YES NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this

research.

YES NO

Participant Name: _____ (Please print)

Participant Signature: _____

Witness Name: _____ (Please print)

Witness Signature: _____

Date: _____

A-3 Interview Notes

(Interview guide is attached in A-1)

Subject	Anne Pinsent
Position	Marble Mountain General Manager
Type	Phone
Use of name and quotes?	Yes
Date	November 14, 2008

Note: Check references say both Newfoundland and Labrador (not just Newfoundland)

1.

- Very important to the economy
    - Less than it is to other provinces
    - Significant for Newfoundland
    - Important for rural areas
    - Keeping some rural communities alive

- MM is the tourism anchor in West
- Both job creation and money is created by tourism
    - Spin off activities
- Creates lots of jobs
- Spending more

b.

- MM in 2004 saw 2 million at the resort & 2 million in spending & 3 million income
- Economic vitality report (hotel, jobs, etc)

2.

- Opening and closing are business decisions – before Christmas and how deep into the Spring
- People usually don't start before Christmas
- Have to weigh cost/benefits if the investment of snow making

- When can tourists travel?
    - Heavy focus on the Summer
    - Spring and Fall for the elderly

- Marble – business decision and weather
    - School vacation and snow creation
- Easter falls different time in the school year

    - Last year Easter was early and the snow was good so MM did a cost/benefit analysis and kept open
- Zip line opening
    - Other activities than skiing necessary
    - Great building/location for conferences, weddings, events. Etc.

- Population
    - What other businesses are around
    - Zip line and golf in the area (not owned by MM)

3.
- In general: 'No'
    - If you can to MM to ski, you will (regardless of weather)
    - People do their research and consider their destination
- Rain/fog – melts snow
    - Affects the last minute decision makers negatively
- Lots of traffic from St. John's
    - Newfoundlanders plan for such weather events and so they don't come less often, just different times
- Plan B? If weather is bad
    - Still ski
    - Gros Morne or the shore are close
        - Especially popular with UK visitors
- International visits
    - 8600 from UK and Ireland (08/09)
- Skier visits are 96 000
- Look at the growth
- No expectations
    - Dramatic weather
- Capital city weather (difference in east and west coast)

4.
- MM's biggest issue is access
    - Car access
    - Ferry is not fun (especially in winter)
- Poor weather for driving
- Air access
    - Gatwick to Deer Lake (4.5-5 hrs)
    - Charter flight
    - Cancelled flights (new announcement)?
- Global tourism linked to the economy
    - Competition especially on the internet
    - Tremblant in Québec and Sandy River in Maine
    - Markets are St. John's, Nova Scotia (no hills)
        - Compete with Vermont

- Climate change note – less snow in the Alps and France results in more international visitors at MM.

5.

- Geography and culture – final frontier
- Can hike and feel safe (few large animals)
- Long history

- MM – use the web, get the word out
    - Convince people there is a mountain in Newfoundland
- Economy is tough
- Easier to attract Europeans to ski in a "neat" place like Newfoundland
- Marble ads focus on Nova Scotia and Newfoundland
- Newfoundland government markets in Ontario
- There needs to be more advertising in the UK
    - Open spaces in Newfoundland (not common in UK)
- Establish a cache with market in UK
- There are ads in ski magazines and National Geography

- Humber Valley
    - Bankrupt
    - Positioned where it is because of MM
    - People still own homes there
- Concern: Humber Valley bankruptcy may leave a bad taste in the mouths of foreigners.

6.

- More money = more leisure activities
    - Expenses of travel
- Business tourism and global travel
    - An oil company asked to rent out all of MM's resort for retreat.

7.

- Absolutely
- Opportunity = no snow in the Alps more foreign visitors
- Eco-tourism, "green" the resort
    - Having the hotel audited
    - Looking for the status of "Green Key"
- Canadian government employees are supposed to use "green" accommodations

- East Coast Music Awards in Corner Brook this year
    - Stage at MM
- Ski conference in Kelowna – part devoted to Climate Change
- Philip Schneow
    - Not going to affect MM too badly?

- Eco-friendly

- Festivals?
    - Snowjob and Snow Jam
    - Marble Jam
    - February to March
    - Big local draw
    - Lots of partners

8.
- Province is very supportive
    - The Premier too
    - Winter tourism marketing is MM
- Winter tourism is a drop in the bucket compared to Summer
- Need for marketing in Europe?

- Grant and aid from Province – $ 400 000
    - MM *was* running at a deficit
    - Could still apply for capital funding
        - I.E. A new ski lift
- MM is there to create a tourism destination
    - There are spin-offs due to MM
- Humber Valley still has potential
- Marble Mountain = economic generator
    - Government investment in the area
    - Returns are seen in taxes from the area

- OK to use name

-

Subject	Juanita Keel-Ryan
Position	Director, Tourism Product Development
Type	Phone
Use of name and quotes?	Yes
Date	October 31, 2008

1.
- Tourism is 5th in GDP
    - Substantial piece of business
    - 30 000 man hours?
    - High number of employees
    - Especially important in small regions – may be their major industry
- 37 million dollars just from hunting/fishing (outfitting)
    - 1800 workers (very seasonal) from outfitting
    - All rural employment
    - Outfitting sector
- Larger sectors employ people in the tourism industry year round
- * Check stats section of NL website

2.
- Bonavista Peninsula
    - Province worked to extend the season from June to Thanksgiving
    - Hotels showed an increase from 39% occupancy pre-program to 49% post-program
    - Province is looking at doing the same in the West for spring expansion for icebergs
    - Festivals to run in the spring
        - 3 year program starts in 2009
- Winter expansion
    - For non-residents, snowmobiling and skiing are the attractions
    - For residents, vacation packages have begun
    - Suburb snowmobile trails are well groomed
        - Used by locals for travel and tour
        - Lots of spin-off money (restaurants and gas stations)

- Marble Mountain and Humber Valley lost the United Kingdom to Deer Lake flight
    - Humber Valley is facing major problems
    - Both West and East are popular with international travelers
        - Especially German hikers
        - Both Gros Morne and East Coast Trail
    - Travel packages for schools are popular but mostly in the Summer for the West
- Impact of flight cancellation could be great

    - Wait and see
    - No UK flights to Newfoundland (have to back track from Halifax)

3.

- People don't come to Newfoundland for the weather
    - Weather is a factor in the Winter
    - Perception is a bigger issue than the reality
- Weather rarely come up in exit surveys of visitors
    - "Insignificant"
- Longer/warmer summer is not an issue – the summers are already nice
    - Raising sea-levels and glacial melts are an issue
- Climate change could impact the winter travel
    - Potential impacts
    - The province is aware of this
- People are prepared for weather
    - Newfoundland attracts seasoned travelers
    - No such thing as bad weather, only bad clothing
- Weather is not seen as an issue
    - Weather is not advertised as bad
    - No warning is given to travelers
    - Travelers do their own research

4.

- Access is the biggest obstacle – especially for the island
    - Limited by number of seats on a place or a boat
- Trying to get Marne Atlantic to improve boats and get more boats
    - 4th boat on the way
    - Maybe a new transport boat for trucks only
- Planes taking away from ferries?
    - No – travel patterns are changing

5.

- Opportunity: Newfoundland is an interesting destination
- Not well known but the word is spreading
- Assets are the people and places
    - Geography is "awesome"
        - Includes scenery and wildlife
    - There may not be great variety but there is a good deal of "spectacle material"
- Newfoundland tradition is an asset
    - Visitors have a positive experience
    - Bring good experience home
    - Marketing is being increased

- Wilderness – lots of land for few people

    - There is a concern for wilderness and for the scenery for the local and the tourists
    - Climate change impact in British Columbia (Pine beetle) is a red flag for Newfoundland - warning
    - Not enough visitors for tourists to be a major problem
- Newfoundland attracts the right tourists
    - Small number of tourists
    - Time for planners to prepare

6.

- Oil money is positive
- More meetings and conventions for the big companies
- Airlines may be pressured to increase flights
    - May increase ability for leisure travelers
- Employees with the oil industries are on 1-2 year contracts
    - They travel the island
    - Bring in visitors
    - Spread word of mouth when they leave

7.

- The tourism sector needs to take notice of climate change
- Need to track what is happening
- Need to work at making the industry more sustainable (in all senses)
- Reduce consumption
- Keep resources sustainable
- Potential impacts are concerns
    - There are still opportunities
    - Need more education on climate change
        - Especially on the impact of travel
- Positive: climate change needs a reduction of air traffic
    - Take-off and landing are the biggest fuel burners
        - People could extend their stays
        - The average stay is 10-14 days (old data)

8.

- Agrees with the direction of the tourism sector
- Good focus
- Government and industry work together
    - Currently creating a long-term vision
- They work well together
- There is a climate change program in Gros Morne
    - Make the industry more sustainable (economically, culturally, sociably, and environmentally)
- More energy efficiency
    - Help preserve the environment
    - There is no significant disagreement

- OK to use name
- Send copy when done

Subject	Dr. James Overton
Position	Professor, Memorial University
Type	In-person
Use of name and quotes?	Yes
Date	June 23, 2008

Note - * Newfoundland's provincial planning department has been dismantled?

1.
- Attractiveness of Newfoundland
    - Vis-à-vis competition
    - Tourism is relative

2.
- Larger forces that effect it
    - Environmental movement – helpful? As Newfoundland is a natural setting

3.
- Marble Mountain patterns
    - Overall heavy snow
    - Humber Valley resort (money)
    - Semi-retirement community
    - Being bought up by Europeans
    - Difficulty with flights into Deer Lake
- Winter snow mobile trails have been heavily invested in
    - Long range trails
    - Attract a different tourism market
- Smaller ski slopes?
    - Lots of government funding has gone into Marble Mountain

4.
- Shrinking populations
    - Very few people are making money
- Tourism is no replacement for the fisheries
    - Money is still needed in the off-season
- Tourism is a marginal activity
    - Big changes – oil prices raising
    - Affects cost of traveling to Newfoundland
- Tourism will never be the mass market
- Deregulation of Canadian flights (flying to Newfoundland becomes more expensive)
- Direct flight connection with London is gone
- Difficulty of getting to Newfoundland

7.
- Dr. Overton's suggestions:
    - People's perceptions of climate change
    - HNL and Planners – what do they think?

    - Is climate change on their horizon?
        - What do the decision makers think? Who? What are they saying?

5.

- Fall activities of hunting and a late golf season
- Market for older people?
- Where do these perceptions come from?
- What do people identify as problems?
- Basic infrastructure lacking:
    - Restaurants, gas stations, amenities
- Rainy days… what do tourists do?
- Need a wider range of amenities
- Populations statistics
    - Especially rural
    - Age structure
    - What do the demographics mean for service?
    - Ripple effect to tourism?
- For every success (Twillingate) there are more failures
- No replacements for the older population

8.

- Changes in fishing and logging industries have resulted in major changes
    - Less employment
- Federal and provincial changes have impacted the unemployment system
- Money is moving out of the rural areas
- There is a centralization of services
    - Government saving money
    - Takes jobs out of rural
    - Costs are moved to patients (i.e. travel to hospitals)
- Changes since 1990s

6.

- Oil money is a joke to rural residents?
    - Few are benefiting form it
    - Where does the revenue go?
    - Cut backs to the rural
- Municipalities are hard pressed to keep a government
    - Debts exist in paying for infrastructure
    - More infrastructure than people
- Dynamic place of change

-

Subject	Penny Brake
Position	Newfoundland and Labrador Snowmobiling Federation Executive Director
Type	Phone
Use of name and quotes?	Yes
Date	September 19, 2008

Pre-interview notes:

- More local participation in snowmobiling sector than out-of-province
    - Increases in out-of-province beginning
    - Marketing?
    - Main tourist market is Ontario and the Maritimes
- Winter tourism steering committee (Brake is a member)
- Tourism is very important for snowmobiling
    - Starting to create job in the accommodation sector
- Penny Brake defines tourists as anyone who travels to a new area

1.

- Significant amount of revenue
    a. Especially in equipment sales
    b. 192 million dollars was projected for 2005
- Difficult to track quantitative data
    - Province is not recording these numbers – Brake is pushing for this

2.

- Certain parts of the island have a very long snowmobiling season (Dec – Apr in the West)
    - Rain could hurt the East in season length but is only uncomfortable for the West
    - East can get too much snow or too much rain, is very weather dependant
    - West has so much snow that there is no problem

3.

- Most go to the West to snowmobile
    - Plan B is unnecessary in West
    - Skiing could be a backup

4.

- An obstacle is the Department of Tourism
    - Not operators and government all on same page
    - Some want to push winter tourism as shopping in St. John's
    - Brake believes cultural tourism is not winter tourism
    - Some say Newfoundland has no winter tourism product – Brake disagrees

    - 11-12 million dollars worth of trails and Marble Mountain
- Corner is starting to be turned
    - Starting to talk about winter tourism more freely
- Weather is no obstacle for the West
- Grooming equipment is an issue (expensive)

5.
- Opportunities
    - Lots of Crown land and back country riding in Newfoundland
    - Can get off the trails and go anywhere
    - Gros Morne is the only National Park that allows snowmobiling

6.
- Oil = more disposable income
    - More money to spend
    - More money will be spent on recreation
    - Already there has been an increase in the number of snowmobiles sold
    - This is an advantage
    - More money in St. John's means more people can vacation out of St. John's
    - Snowmobiling Federation is working on getting a piece of the oil pie

7.
- Climate change, less snow or later snow has been recorded
    - Not an issue (especially on top of the mountains)

8.
- Not totally in agreement with the Department of Tourism
    - Winter tourism needs to be pushed more
    - Winter tourism needs an operating subsidy and an increase in marketing

Subject	Dr. Norm Catto
Position	Professor, Memorial University
Type	Phone
Use of name and quotes?	Yes
Date	November 14, 2008

1.

- Very important
    - Especially in the rural areas
    - "Salvation"
    - Overrated in terms of the impacts with full-time jobs created
- Both jobs and money

2.

- Seasons length is important in terms of economics
- The infrastructure is there
- Seasonality is being addressed
    - How to tap into different markets
- Bona Vista Trail and Daniel's Harbour
    - Example of trying to lengthen season

3.

- Certain activities are affected.
    - I.e. Skiing
- Affects people who do not prepare for the weather
- Fog is not much of an issue
    - Seen as romantic
- Snow conditions are crucial for winter side
- Temperature is hard for people to get used to
    - Affects rate
- East versus West
    - Quality of snow
    - Cross country variance
- Catto's findings: snow decreases in some localities and increases in others
- Variations due to elevation.
    - Marble Mountain is safer
- 1930-33 Independent Newfoundland went bankrupt
    - Reverted back to colony
    - Therefore money is the reason for missing climate data in this period
- Airports connection is crucial
- Depends on the tourist
    - Adverse is dependant
    - People expect the cold – often are pleasantly surprised
    - Not many came in for St. John's

- East unhappiness over cross-country skiing
    - East coast trail is in theory open to cross country skiing but the terrain is difficult.
    - No tourism surveys in the winter.

4.
- The exchange rate and the price of fuel
    - Both are correcting themselves
    - Problems come from outside the province
- Locally – accessibility (ferries and flights)
- Difficult to come to Newfoundland "casually"
- No flight to Heathrow – possibly reinstated by Air Canada?
- Humber Valley Resort has financial problems

5.
- Attractive market
- Unique features
- Could be promoted more effectively
- Not a family get-away
- Need to find appropriate market and demographics
    - Operators need to find matching market

6.
- Availability of hotel space in St John's will be affected
    - More hotels to be built.
    - May affect other underdeveloped areas
- Province does see tourism as central to development
    - Expected to increase or continue
- There are other demands
    - I.e. public demands, shortage of nurses

7.
- Need to consider what is happening
- Not mitigation
- Viability of downhill skiing
    - Some have more snow
- Larger shoulder seasons could be facilitated
- Interruptions to the ferry service
    - Supplies and tourists
    - Due to storms
- Province has been proactive
    - Talking about it
- Going towards adaptation

8.
- Environment and tourism are in the same direction.

- Marketing seems to work.
- Parks
    - Tourism could do more for parks.

Notes:

His MA student is doing similar work, but her work is more biophysical (no interviews).

Ethics – clear to use his name.

Subject	Ken O'Brien
Position	St. John's, Manager of Planning and Information
Type	Phone
Use of name and quotes?	Yes
Date	August 21, 2008

1.

- Economic development
    - Direct
- Important for St. John's and growing
- Especially in Bonavista and other "pockets"
    - Top down – who gets promoted and local people pushing
    - Regional association
- Avalon conventions bureau
    - Destination St. John's
- Stats for tourism in St. John's
    - Convention markets
    - Increase in cruise ships
- Spin off conventions
    - Meeting spaces and hotels increase
    - Hotels growing
    - Occupancy rate is high (60%)
    - Shoulder seasons are improving

- Hebron offshore deal just signed

2.

- Season length an issue?
    - Winter is
    - Little outdoor activity
- West does get reliable winter weather
    - Skiing
- St. John's ski hill
    - Logey Bay Lump
- Small operation
    - Small hill
- Choices are White Hills or Marble Mountain

3.

- Outdoors are susceptible
    - Ex. Rosatta was delayed for 2 days due to weather
    - George Street festivals
- St. John's Time
    - Buskers festival and Newfoundland folk festival
- Big outdoors events

    - People come home for them
- Defer until later if weather affects it
- George Street can survive weather
    - Bars
- Weather can be "Kinda miserable"
- Longer and warmer under global warming?
    - Definitely would help
    - Especially length
- Short window: June, July, and August
    - And June is still iffy
    - June – Mauzy (Capelin weather)
- Last few years have been really unreliable
    - Hit and miss
    - Other parts of island too

- Fall – nice weather, cooler
    - Bonavista tour – campaigning within province to attract people to come in Fall
    - Push to extend season
    - Kept people on and places open until October
- Looking for tourists within the Rock
    - Middle ages
- Travelers' reaction?
    - Ads show the sun
    - Why not capitalize on the fog?
    - Be more honest in ads
    - Present a valid image here
    - "Be honest"
    - More people disappointed

4.

- Cost of fuel will limit tourism
    - Gas prices are high
    - If the Province is relying on people traveling long distances then there will be issues
    - Look to local population for tourists and closer provinces
    - Ferry to St John's
        - Big loss to Peninsula
    - High cost of getting there

5.

- East Coast Music has put Newfoundland in the public eye
    - This is an opportunity
- Interest fades?
    - Cultural experience
- Newfoundland still has the scenery

    - 20 minute drive from downtown is wilderness
        - Great accessibility
- If you have been before you will be back
- New angles and new people
    - Music and culture before
    - Trail systems being developed for new tourism
    - East coast trail
    - Active vacation and infrastructure being put into place
- Opportunity
    - Peak periods can be hard to get rental cars or flights
        - Airport is expanding
- West Humber Valley
    - European exposure (German, British, and French)
    - Buying or visiting
    - Flight from London to Deer Lake cancelled
- Air Canada: Heathrow to St. John's
    - Last year the flight was dropped
    - Sore point
    - Now have to go over St. John's to Halifax
    - Inconvenient and a waste of fuel

6.

- Oil – Province and Hebron just signed
    - Property in St. John's became more expensive
- People in the industry are European
    - Word of mouth travels
- 10 years back could not find a high end restaurant in St. John's
    - Oil clients drove this expansion
    - This funds tourism industry
- Culture richness is new
    - Always been a mix of culture but now it is sticking
- People open up businesses after coming over for the oil boom

7.

- What will climate affect?
    - More/heavier rainfall
    - Flooding
    - Closed Trans-Canada
    - More extreme weather
- Positive if warmer weather comes in and makes the climate more reliable

- Insects are increasing
    - Elm-spear-worm
    - Eats maple trees
    - Outbreaks linked to climate change
- Labrador as well

    - Aside: Coyotes are now on the island, will it impact the caribou hunt?

8.

- Direction – attraction to ATVs and snowmobiles
    - Newfoundland trails way
    - Rails to trails
- Non-motorized sea kayaking
- Triathlons, bring in sports
- Not all motorized
    - With gas prices rising, less driving

- Province is promoting kitchen parties
    - Dinners at halls
    - Word "authentic" is over used
- Keep it authentic without faking it
- Look for Clare Gunn "Unsellable Tourism Product"?
    - Outport cannot be sold
- Check with HNL

- Name use is OK
- Contact: Kevin Gushue
    - Tourism development
    - 576-8545

-

Subject	Greg Hillier
Position	Golf Newfoundland Labrador, Executive Director
Type	In-person
Use of name and quotes?	Yes
Date	June 17, 2008

Notes:

- 21 golf courses in NL
- Season normally May 7 to the end of October (sometimes later)
  - April 14th is the earliest Hillier has seen
  - Safe to say 1st week in May will be open
- Private Clubs can go longer because members pay the costs
- Public courses would loose on overhead costs
- Labrador golf runs from June to September

1.

- Tourism industry ranked 2nd or 3rd on a scale out of 10
  - Important because it brings new money into the economy rather than recycling money
- Hillier considers a tourist in the true sense – 20 minutes from home or more
- 15 GNL members are in rural Newfoundland, for them it is an important economy
- July – August are main tourism months
- Golf can function as a "shoulder season industry" because it can benefit from travelers here for conferences, business, etc.
- Draw from pre/post-conference
- St. John's is a major hub and Gander is the hub for Newfoundland
- Golf can act as an extension for tourists
- Tourists arrive 80/20 air versus car, St. John's receives a lot of the air traffic and so can benefit from tourism as an industry but for the rural areas tourism is subsidiary
- Tourism is not the magic bullet
- There needs to be a infrastructure investment for the rural areas
- Tourists come for the cultural experience – which is free
- The urban centers see more revenue from tourism

2.

- Season length, it is all dictated by weather
- Weather plays a major factor for golf and for tourism as a whole
- (Icebergs don't work with the July/August peak season)
- In the golf industry, if you lose a day you don't get it back
- Closing in October is partially to winterize the grass and the course

- British Columbia can have year round golfing because they are so far south but also because they have shorter daylight hours – the course can recuperate at night
- When can maintenance get done?
- Some Newfoundland courses can be open from 6AM until 10 PM

3.

- Rain checks offered by management as a way of being accommodating to visitors in poor weather
- Refunds are common – for visitors who cant return
- Hospitality is the goal
- "Don't want to leave a bad taste in their mouths"
- "Part of being a Newfoundlander" "Hospitable culture"
- "The old adage: A visitor that has a bad experience tells 10 people while a visitor that had a good experience tells 1"

4.

- Cost: there are no "accidental tourists" in Newfoundland
    - You need to plan to come
    - Takes time to get here
    - Problems with the ferry (feels like a "cattle boat")
- Government run ferry with no competition
- Accommodation is reasonable prices (just expensive to get here)
- Golf Association is implementing a star system to rate the quality of the courses because the prices are so low they are perceived as lower quality by tourists
- **90% of demand is through tourism
- Local base is needed for a successful course
    - Locals need to be able to afford to play and the market defines the price
    - Tourism is the extra income
- Tourism revenue looks less impressive when spread out
- Urban centers see more profits
- Visitors have the trip planed – no accidents

5.

- Newfoundland and Labrador are the most untapped part of North America
- People come for curiosity and to see a unique culture
- People don't come to see a city, they come for the "rural flavor"
- Cultural identity needs to be maintained
- Important that Labrador was opened up
- Labrador is the last untapped frontier
- Museums, Churchill, Mines, tours, etc.
- Hunting and Fishing in Labrador – virgin country
- Not promoted enough

6.

- Invest in tourism infrastructure
- Make sure services and amenities are there
- Interesting to see how far the money will stretch
- Will the money focus on the urban centers
- Oil money has potential
- Tourism has provided marketing with more money – more may become available
- Negatives of loss of identity, especially in urban centers
- "Forget who you are and where you are"
- Loss of identity in St. John's
- St. John's as an oil town or as a tourism attraction
    - Will the oil make it unattractive?
- To see Newfoundland, one must "get out of the concrete jungle"

7.

- Climate change is going to affect everyone
- Most Newfoundlanders will say "We'll take warming over cooling"
- There have been shifts in weather patterns
- Climate change will cut into travel
    - People do not travel when unsafe or uncertain
- Increased costs
- Golf (and tourism) is based on expendable income
- Golf is a heavy ticket item
- Climate change and tourism: "Will icebergs go the way of the Dodo bird?"
- People have become more selective with their spending
    - Attitudes are changing
- Expanding the gold window (starting earlier) may get people into the golf routine
- 25-30% of the courses are membership courses – overhead costs of a longer season can be shifted to the members' fees
- There is potential if the right moves are made
- A longer season can give more opportunity to the shoulder industry of golf
- Do earlier start times mean earlier closures?
    - Properly manage the changes can allow for more profits and more employment
    - 10% of the golf industry is full time – the rest are seasonal (can be extended with climate change)
- There is a "stigma that Newfoundland has bad weather" but the weather is still good in September and October

8.

- The government is missing the boat in not funding regional tourism associations
    - Most associations are run by volunteers who can't access funding
    - Regional tourism associations need money for human resources people

- There is too much work for volunteers – proactive action needs to be taken
- Hard for sub-regions to get funding
- More downloading means less will happen
- Tourism as a regional opportunity
- Associations have a hard time getting businesses onside (province will not invest if the associations don't have the business' support)
- The grant process is slow – human resource people and experts are needed for this
    - Get good ideas off the table
    - Too many ideas are "left on the shelf" due to lack of funding
- The funding is there but trained people are needed to get it and to push projects forward

- Can e-mail more questions
- Direct quotes are fine – confirmation is not needed.

Subject	Andy Hennebury
Position	Tourism Product Development Officer
Type	Phone
Use of name and quotes?	Pending
Date	October 23, 2008

Notes:

- Andy sits on the interdepartmental committee for climate change
    - Tourism representative
    - Recent meeting
    - Inquiry
- Tammy Keats (recommended contact)
    - 709-729-5932

- Interdepartmental report
    - Action plan on climate change
    - Will look into forwarding report
    - Climate change investigation started in July
    - Headed by the Department of the Environment

- Gros Morne
    - Very proactive
    - Andy looks to their direction

- Candice Cochrane (sp?) – recommended contact
    - (QLF) foundation
    - Mapping tourism and climate change
    - She is a researcher
- Tourism Intelligence in Quebec
    - Tourismintelligence.ca
    - Workshop in Gros Morne
- Julianna Prisci
    - Associate professor

- What does a product developer do?
    - Regional officers
    - Hennebury works on the provincial scope
    - Working on trails
    - Mapping tourism assets

1.
- Important
    - More than economics – environmental

    - Keep natural areas pristine
    - Mr. Hennebury comes from rural Newfoundland
        - Tourism cannot replace but can complement existing industries

- Job creation
    - Significant creation for locals
    - Depends regionally
    - Direct and indirect benefits to local business
- Ex: 5/20 communities use tourism and 30% of those are employed by tourism
- Critical cluster needed
- Need a strategic investment of public finds
    - Tourism generate significant funds
    - Hunting and fishing guides (work)
    - Important jobs for rural Newfoundland

2.

- Season length is "up there" in importance
- Some businesses go June to October
    - NL government invested in extending season
    - Keep parks and museums open longer so local businesses will do the same
        - Very successful
- Next '09 they will make an extension into the Fall
    - Spring will be used in Twillingate (iceberg viewing)

- Season affects hunting and fishing
    - Campground season
    - Global warming could see the camping industry growing
    - It is becoming more viable
    - Warmer temperatures will aid this
        - Look at Butterpot Provincial Park website
        - Environmental conservation
        - Data on visitor numbers
- Longer fishing season
    - Different species

- Tourism industry not like other industries
    - How can 2 months work last all year?
    - Keener businesses are growing
- "We'll always have Alberta"
    - Leave for work elsewhere and return home to work tourism season
    - Need to extend season
- Provincial initiatives on re-training
    - How to package tourism products
    - Educate local businesses on cooperation
- Necessity is the mother of all invention
- HNL has the role of training

    - Ex. How to be better hosts and cooks

3.

- Fog and rain can ruin boat tours
- Exit survey – off website
- You are an explorer
- Tour boats are limited by weather
- Sight seeing in rain/fog?
    - Can inhibit tourists
    - Ruin garden parties (big in Newfoundland)

- Is there a Plan B?
    - Not at the provincial level
    - Role for Destination St. John's?
    - Currently up to local business
    - May use this Plan B idea

- Marketing rainy weather?
    - Not done
    - People do need to know to bring appropriate gear
    - British Columbia uses storm watching as a tourism product
    - Storms bring rare birds to shores of Newfoundland – hardcore birders trace storms
    - Newfoundland bird (maybe called Twitchers (sp)?)

4.

- Big backyard for the province can be an obstacle
    - Loss of pristine nature is a worry
    - Environmental degradation
- Concerned with marine litter
- Tourism industry is growing and people are needed to clean up after them

- Car rentals are an issue
- NL rentals are franchises
    - Not enough cars
    - Drivers are going down and fliers are going up
        - Rental places need to supply fliers
    - Most cars are sold off every fall
        - Corporate agencies are buying back
        - Sign the tourism industry is growing

- Tourism is growing
    - People visit and stay
    - Newfoundlanders are leaving and leaving behind bargain houses
    - Ocean front properties for 30-50 thousand
        - Properties are being bought up

- Tourism is not seen as an industry of choice (but necessity)
    - CFAs
- Visitors (outsiders) see the investment opportunity
    - Coastline is an asset

- Newfoundland is a province of resource extraction
    - Tourism can utilize this
- *Product Development Strategy 2005

- Tourism operators do not realize the natural assets*
    - Need to be advocates

5.

- Educating the province on the value and the potential of tourism is a great opportunity
- Can save our natural resources
    - Mapping tourism business
    - Walking and hiking potential
- Map B&Bs (phase 1)
- Map assets and natural areas and trails

- Natural Assts
    - Short window to protect them
- There is no natural development product plan for protection
    - Only reaction to other departments moves

6.

- Marketing budget is increasing
- Attracting highly skilled engineers
    - A web of visitors builds from that
    - New people coming in
    - Word of mouth through travel through jobs
- With money comes people looking for a place on the coastline
    - They are buying up the coastline
        - Takes it away from tourism
        - Nova Scotia already lost its coastline
        - Court cases on fencing off beaches can go over 5 year – at that point the tourism potential has been chocked out

- Higher culinary standards

7.

- Climate change needs to be noticed
    - Cains Quest (winter) in Labrador
        - 2000 kilometer race

        - More people than accommodations can handle
- Destination Labrador, local businesses and government are working to increase capacity
    - Product is there but too soon?

- *Stern Review
    - Economics of climate change
    - Federal document – Chancellor of the Exchequer
- Recently being taken notice
- Both opportunities and threats
    - Threat to coastlines and their tourism products
    - Rising sea-levels and erosion
        - Trail infrastructure
- Physical and chemical erosion
    - Flora and fauna threatened
    - Archeological sites lost
- Loss of infrastructure
    - Extreme events
    - Damages
- Opportunity – if warmer
- Bad reputation for weather
    - Therefore can exceed expectations
- Threat - if warming means the icebergs go, loss of a big tourism draw
- Perceptions are keeping people away
    - Slow tourism growth gives time to identify what is important and time to prepare for tourism

- Potential threat for Marble Mountain
    - Lots of money has gone there
- Winter tourism
    - Winter is terrible in the east
    - More consistent in the west
    - East has "10 months of winter and 2 months of bad weather"
- Newfoundland trail system
    - Snowmobiling is big in west
- West, central and Labrador have the climate for winter tourism

- Winter was not originally looked at as a marketable product
    - Now people say let's develop what we have
    - There is a market for winter/activity tourism
    - Market is there (need to take advantage of it)

8.
- TCR is not bang on
    - Will start to use technology
    - React now – i.e. use GIS and planning to be proactive

    - More data coming in
        - Should all be cross-referenced through departments
    - Coordinate
- In the strategic plan
    - More technology
    - Pc.nc.ca
        - Blue print
- Move towards technologies
    - Can be used for tourism and planning
    - Need base data

Endnotes:
- Will release consent after reading the thesis
- Find Gunn's 4th edition Tourism Planning
- Check MUN.ca for Gunn's article
- *Outfitting strategy
- OK to use name
- Dr. Norm Catto was Mr. Hennebury's supervisor at MUN
    - Call him
    - Ask before I use any of his presentations