PRAIRIE PERSPECTIVES:
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Table of Contents

Preface

The 30th annual meeting of the Prairie Division of the Canadian Association of Geographers was held September 29, 2006 to October 1, 2006 in Rugby, North Dakota. Hosted by the University of North Dakota's Department of Geography, the conference attracted delegates representing a wide spectrum of teaching, research, and service interests in geographical techniques, physical, regional, and human geography. Eighteen papers and eight posters were presented by more than 45 authors from Manitoba, Saskatchewan, North Dakota, Ontario, British Columbia, and Minnesota. Among the attendees was the 2006 keynote speaker Dr. Gary Johnson, Assistant Vice-President for Research and Co-Project Director, ND EPSCor, University of North Dakota. Consistent with past regional meetings, member departments were well represented by a diverse mix of undergraduates, graduate students, staff members, and faculty members presenting their research.

The 2006 PCAG Fieldtrip was organized by the Department of Geography of the University of North Dakota under the leadership of Dr. Gregory S. Vandeberg and Dr. Paul Todhunter. This field trip, "Investigating the Prairie Pothole Region of North Central North Dakota" began and ended at the Rugby EconoLodge, the conference facility. The geographers toured selected portions of Pierce County and Benson County in what is overwhelmingly a landscape of cash grain agriculture focused upon wheat with some livestock operations that are overlain upon glacial drift deposits and marked by numerous wetlands. Communities along the former Great Northern Railway were highlighted with "windshield vistas", including Knox, York, and Leeds. However, special stops were made at Churchs Ferry and Minnewaukan, both communities feeling the adverse affects of the flooding caused by Devils Lake's expansion. A "windshield vista" also was made of Harlow, a Soo Line Railroad community that is typical among the hamlets and villages in the Prairie Pothole region of North Central North Dakota struggling to survive. As the final stop, the tour group visited the Dakota Hills Winery. This is a 25-acre estate vineyard near Knox that utilizes wild grapes, plums, June berries, Saskatoon berries, raspberries, cherries, and niche-market (Norwegian) Josta berries to produce wines as an alternative form of agricultural production. As a special touch, people who came to the annual banquet were treated to products from the Dakota Hills Winery.

Of the 26 conference presentations, four papers and the fieldtrip guide are included in this year's volume of Prairie Perspectives - plus nine additional papers that, due to an unfortunate funding problem, would have appeared in the second issue of last year's volume that had to be cancelled. All papers submitted to Prairie Perspectives are subject to a double-blind peer review process. For each paper we were able to solicit reviews from leading researchers at universities across Canada. We are pleased to present a collection of papers that demonstrate research of high quality.

The first two papers focus on Canada's Indigenous people. Hamilton addresses the land settlement of the Metis at Willow Bunch, Saskatchewan, 1840-1910 whereas Wouters and Peters examine urban aboriginal settlement patterns and housing characteristics as distributed in major prairie cities in 2001. Next comes a single entry on social geography that is the work of Lovett and Beesley on residential preferences of Canada's creative class. Then, another group of papers is seen with Koster's article on community-based tourism and Everitt's case study of tourism in the British Virgin Islands. Sustainable development is the focus of the sixth paper in this volume with the emphasis of study by Haque, Deb, and Medieiros being the Cananeia Oyster Producers Cooperative in Brazil. A set of papers then follows which highlights geographic techniques as applied to environmental problems. Henderson and Piwowar consider the effectiveness of remote sensing for studying boreal forest response to moisture stress with Luo and Piwowar then examining the use of GIS for assessing wildfire risks to climate change in Saskatchewan. A geomorphology study follows and introduces a new theme in this volume. Zaniewski, McGinn, and Wiseman present findings on the extent and characteristics of glaciolacustrine and other deposits in Riding Mountain's Otter Lake Basin. Practical applications of geographic inquiry is the thrust of the tenth paper in this volume with the work of Paton, Champagne, and McGinn regarding wastewater reclamation and re-use in Riding Mountain's Clear Lake Watershed. Next comes a paper in historical geography by Selwood and Brayshay about studying the Hudson's Bay Company in terms of how this corporation was thinking globally and acting locally in its governor's 1934 tour of the company's operations in the eastern Arctic. The final group of papers reflects the work of human geographers in literary geography. Cecil and Cecil consider memory and place-based identity of the elderly in two of Margaret Atwood's texts while Zubrycki examines the notion of literary utopias being literal hells.

As conference organizer, I would like to thank all conference participants and the countless number of individuals who helped organize the 2006 meeting of the PCAG at Rugby, North Dakota. As guest editor for

this volume of Prairie Perspectives, I also would like to thank the authors for their contribution to this journal, and the manuscript reviewers for their valuable service to the PCAG. Finally, I especially am grateful to Weldon Hiebert, University of Winnipeg, who once again managed the layout and production of the journal.

Finally I would like to express my gratitude to the Association of North Dakota Geographers for their support in the production of these proceedings.

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Métis land settlement at Willow Bunch, Saskatchewan, 1840-1910

Beckey Hamilton, University of Regina Luther College

Introduction

There have been numerous studies of ethnic group settlement in western Canada. Researchers have sought to explain why ethnic groups chose particular areas for settlement.[1] Reasons for individual land selections have also been studied, for many groups.[2] This study seeks to add to this literature with a detailed study of Métis land settlement at Willow Bunch, a community located in south central Saskatchewan (Figure 1). Although the history of this group's coming to Willow Bunch is outlined, particular attention is given to Métis land selection; this aspect of Métis settlement has yet to be extensively studied.

Overview of Literature

Much interest and debate relative to Métis settlement in western Canada has centered around their withdrawal from farmland in Manitoba (Sprague 1980; 1991; Mailhot & Sprague 1985; Ens 1983, 1988, 1989, 1996, 2003; St- Onge 1985; Flanagan 1991; Flanagan & Ens, 1994; Milne 1995) and commitment to agriculture at Red River (Clark 1983). Still, a few maps depict their dispersal from Red River and the locations of their wintering places and settlements on the western plains (Gabriel Dumont Institute 1987, 1994; Burley & Horsfall 1989; Ens 1996; Anderson 1999; Hamilton & Nicholson 2000). Moreover, a project is underway to document and map the Métis homeland (Boisvert, Tough and Ellehøj 2007; Omosa, Ellehøj and Tough 2007; Taylor, Boisvert, Ellhøj and Tough 2007; Tough and Ellehøj 2007).

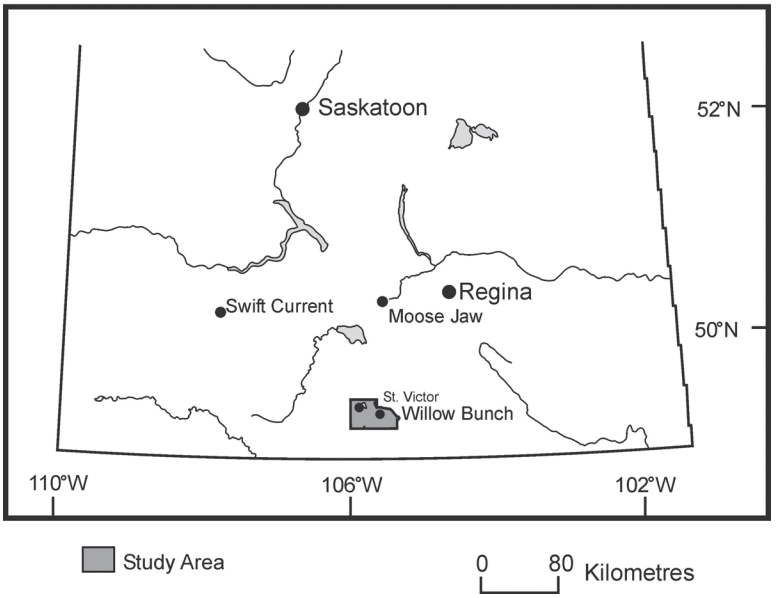


Figure 1: *Study area.*

Some analysis has been made of the location of Métis settlements. This includes explanations of the broad pattern of their settlements in western Canada (Giraud 1954, 1986) and of the specific location of a few communities, including Lac Sainte Anne and Saint Albert (Moodie 1965), Pakan or Victoria (Ironside & Tomasky 1971) and Saint Laurent (St-Onge 2004). Anderson (2005) summarizes the historical factors behind the founding of several communities. Payment (1986) is among the few to offer a more detailed discussion of the locational characteristics of a Métis settlement. She briefly commented the family nature of Métis migration from Red River, their resettlement in family-based communities in the Batoche area, and their selection of river lots.

Several descriptions have been made of the history of Willow Bunch. Rondeau (1923) produced the first published history of the community. Chabot (1970) updated Rondeau's history, to the time of writing. Some family stories have been included in the local history of Willow Bunch rural municipality (Willow Bunch Historical Society 1998). More recently, however, it has been noted that none of these works well described the Métis and their contributions to the community. Armstrong (2000) and Rivard and Littlejohn (2003) have contributed to filling this gap. Yet, while these works comment on early Métis settlement in this area, and provide

some reasons for the general location of their community, they remain largely historical and do not include a detailed analysis of Métis land selection within the community.

Historical Background to Métis Migration to Willow Bunch

The mid-1800s brought hardship to the Métis of the Red River settlement. By this time, over-hunting had made the once vast herds of buffalo, the mainstay of their economy, scarce. In fact, twenty years had passed since the Métis had made their first forays to the plains for provisions, and since George Simpson, officer of the Hudson's Bay Company (H.B.C.) at Fort Garry, had forecast the bison's extinction. Moreover, in the decades that had followed the merger of the Northwest Company and the Hudson's Bay Company (in 1821), seasonal work freighting or portaging for the company had been more difficult to find. The H.B.C.'s development of farms at Lower Fort Garry and Saint François Xavier, and the saturation of pemmican markets in the 1830s had reduced the company's needs for surplus pemmican and farm produce. Population increase had crowded the Métis' river lots and droughts, pests and frost had caused their crops to fail regularly. These conditions provided the push for outmigration. By the 1840s, temporary departures from the colony were common. Many followed the still large buffalo herds to the west and traded with the Bay company or with Americans, who had recently opened posts on the southern Red River and upper Missouri River, and who offered competitive returns (Martel 1979, 77; Giraud 1986, 409; Pannekoek 1988, 85-87; Ens 1989, 48, 58, 78, 83, 90; Potyondi 1995, 25; Harroun Foster 2006, 186).

The buffalo economy required close proximity to the herds; by the 1850s achieving this often demanded wintering west of the Red River settlement. Pembina and later Saint Joseph's, North Dakota, both about a six day journey from the herds, emerged as wintering places, and became central in the Métis' economy (Giraud 1954, 12; Ens 1996, 77; Harroun Foster 2006, 187).

The continued decimation of the buffalo herds and the calamities that affected those who farmed at Red River contributed to larger and more distant migrations in the1860s. The hunt in 1866 was the last that originated from Red River. So few were the buffalo on the eastern plains at this time that Métis who wished to continue hunting, and taking advantage of the increased prices for robes,[3] could no longer start from Red River (Ens 1989, 208-209; Ens 1996, 75-77, 120). Drought and grasshoppers plagued

the Red River settlement through the decade. Crop failures were so severe in 1862 that the Hudson's Bay Company distributed seed grain so that starvation might be avoided. Two years later, hot, dry weather again burned large areas of crops and grasshoppers ate the remainder. Harvests were even smaller in 1868. That year, the potato harvest, normally 12,000 bushels, was just 5,000 bushels. The harvest of 15,000 bushels of grain in 1867, a year when crops were described as only mediocre, dropped to 1,200 bushels in 1868. Again, it was only charitable distributions of food and seed, this time from the Council of Assiniboia that saved many in the settlement from starvation. Moreover, as of the middle of the decade, typhus and dysentery spread through the poorly ventilated, single room homes that lined the Red River. (Friesen 1984, 116; Pannekoek 1988, 71; Ens 1989, 191; Ens 1993, 254; Ens 1996, 110, 137).

The next year, in 1869, Rupert's Land, until then held by the Hudson's Bay Company, was transferred to the new Dominion of Canada. This sale and the land survey, into townships, a pattern that was unfamiliar to the inhabitants of Red River, were completed without permission of the colony's residents. Frustrations over these actions contributed to the Red River Resistance. As a result of the resistance, the Métis won the "postage stamp" province of Manitoba, and many of the rights that they had demanded, but the settlement fell to the Dominion Government's Colonel Garnet Wolseley. Moreover, hostile feelings persisted at Red River; this, along with in-migration from Ontario and the decision not to grant amnesty for Riel supporters, contributed to further Métis departure (Métis Scrip Claim [M.S.] 5218, 5249; Friesen 1984, 120-127; Ens 1996, 166).

Métis Wintering Locations in Southwestern Saskatchewan

The Métis' migrations from Red River, to wintering locations near the buffalo, took a few to Wood Mountain, Eastend and Cypress Hills, in the 1840s and 1850s (M.S. 1004, 1312, 1651, 1675; Nelson 1973, 98). The number of Métis in southwestern Saskatchewan increased slowly during the early 1860s. Records ascertain that between 1861 and 1865 nine were at Wood Mountain and two were at Cypress Hills. However, the situation at Red River contributed to larger migrations during the later part of the decade. In 1868, fifteen families followed the earlier migrants to southwestern Saskatchewan, hoping to "escap[e] the ravages of the grasshoppers." They built residences at *Rivière Blanche* (Whitemud or Frenchman River, probably near Seventy Mile Crossing). Many more followed, to Wood Mountain, the next winter (Giraud 1954, 2; Loveridge & Potyondi 1983, 60).

However, George Fisher,[4] an independent trader who had been among those who camped in the area in 1869, apparently attracted the largest contingent, of somewhere between 35 and 75 families (Spence 2000, 14). After wintering near Wood Mountain, George Fisher had returned to Red River and had spoken of a "real hunter's paradise" with ample buffalo (Musée de Willow Bunch, n.d.; Rivard and Littlejohn 2003, 105). But, buffalo were not the only attraction. Mule and white tail deer, pronghorn antelope, elk, jack rabbits, badgers, porcupines, snow and Canada geese, prairie chickens, ducks, coyotes, fox, beaver and wolves could also be hunted and fished. The rolling hills, willow and poplar shrubs, wild saskatoons, chokecherries and strawberries, and the abundant springs and creeks provided protection and sustenance (Surveyors Field Notebooks; Giraud 1954; Préfontaine, Young, Paquin & Dorion 2003). Still, unlike some wintering sites,[5] Coulée-Chapelle and Coulée-des-Rochers, the sites near Wood Mountain that the Métis selected, offered little protection from others who used the area. Several First Nations, the Atsina (Gros Ventre), Lakota (Sioux), Nakota (Assiniboine), Plains Cree and Siksika (Blackfoot), had claimed the hunting grounds of southwestern Saskatchewan. Hostilities increased as the buffalo declined. Indeed, when the Cree, Saulteaux and Lakota saw that the Métis appeared intent on staying, and were competitors for the declining game, they attacked their settlement. As of 1873, the Métis needed a military guard to watch over their camp at night. In later years, southwestern Saskatchewan was known both as a "no mans land", an area into which few ventured without superior numbers or weapons, and was an area where First Nations and Métis people congregated, as buffalo were no longer to be found elsewhere on the plains (Légaré c.1914, n.p.; "Histoire de W.B.", n.p.; Loveridge & Potyondi 1983, chapter 2; Hildebrandt & Hubner 1994, 39-40; Préfontaine 2003; Anderson 2005, 360).

The maps of adults' birthplaces, places of marriage, and childrens' birthplaces (Figures 2, 3 and 4) depict the patterns of Métis migrations at this time. Many adults were born in Saint François Xavier, Manitoba.[6] The frequency of marriage at Saint Joseph's, North Dakota, of childrens' birthplaces at Sainte Agathe, Manitoba, one of the southernmost parishes in the Red River settlement, or at Wood Mountain, shows both the Métis' pattern of westward movement as the buffalo herds declined, and suggests that those who wintered at Wood Mountain may have been acquainted. Although the links between families were not fully traced, family names further suggested that many who had made their way to Wood Mountain were related.[7] Many, who, as adults, wintered at Wood Mountain in 1870-1871, had likely left Saint François Xavier, with others they knew, when it became impossible to start hunts from Red River, if they had not left

Number of Adults (18 years or over)

- 1
- 2
- 3
- 4
- Location of Wood Mountain

Manitoba (undifferentiated) = 3
Canadian Northwest (undifferentiated) = 3
Total = 22

Source: Métis scrip claims

Figure 2: *Birthplaces of Métis adults at Wood Mountain, 1870-1871.*

earlier.[8] Likely, they had initially moved to Sainte Agathe or Saint Joseph's, communities that were nearer to the herds, and allowed them to continue to hunt. However, as time passed, they had moved west, to winter, or to reside, at least temporarily, at Wood Mountain.

Indeed, the Wood Mountain wintering site, like many others, was ephemeral. The requirements of proximity to the herds and the declining number of buffalo at Wood Mountain meant that by 1875, the Métis congregated at Cypress Hills. Although increased scarcity elsewhere led to Cypress Hills being known, at this time, as the buffalos' last refuge, the herds remained plentiful for only a short time (Légaré 1914, n.p.; Hawkes

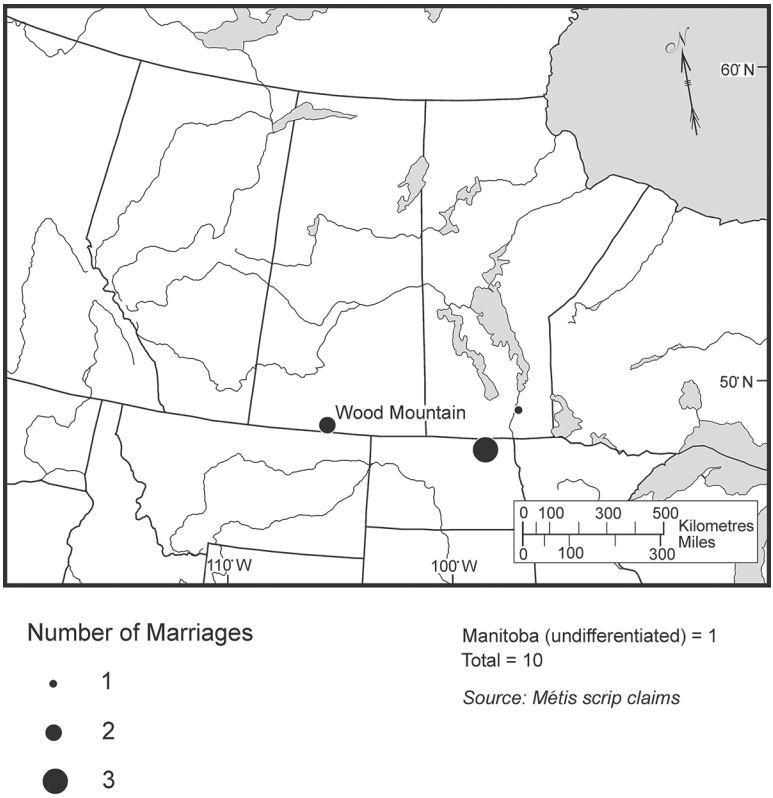
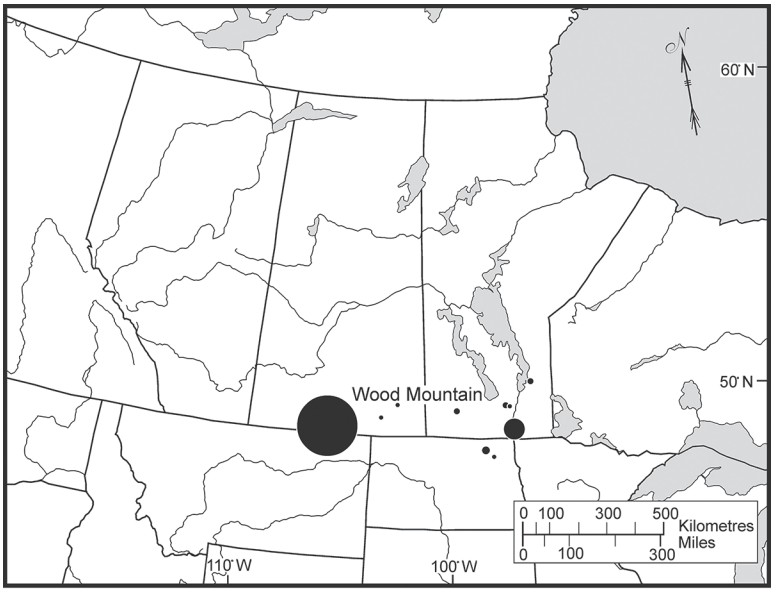


Figure 3: *Marriage places of Métis at Wood Mountain, 1870-1871.*

1924, 1047; Nelson 1973; Giraud 1986, 413). In February 1879, Father Hugonard reported to Archbishop Taché that most of the buffalo and other large game had left Canadian territory (Fonds Taché [F.T.], Hugonard 17 February [1879?]). Hunts that year took the Métis into the United States, though American officers soon turned them back to Canada. The next year, they again entered the United States. Rather than hunt, however, they encountered Miles, an American General, at Milk River. Under pressure from American ranchers and business people who were concerned that Métis from Canada might sell arms to the Lakota, and viewing their hunt as illegal, he took 300 Métis families prisoner. Although Superintendent Walsh, of the Northwest Mounted Police, secured the release of 130 families who wanted to return to Canada, the group was dispersed as the American army escorted others to settle at Judith Basin and Turtle Mountain. In the



Number of Children (0-17 years)

1
2
3
6
25

Canadian Northwest (undifferentiated) = 3
United States (undifferentiated) = 4
Total = 51

Source: Métis scrip claims

Figure 4: *Birthplaces of Métis children at Wood Mountain, 1870-1871.*

end, about a third of the families returned across the border and settled near Jean Louis Légaré's store at Wood Mountain or in Grant's, Portas', Bonneau, and Bellegarde villages, between Wood Mountain Post and Big Muddy River, or in one of at least five communities in the Cypress Hills (F.T., Hugonard to Taché 17 February [1879?]; 25 November 1879; Canada Sessional Papers [C.S.P.] 1880, 11, 14; Hawkes 1924, 1048; Saskatchewan Environment and Resource Management n.d.; Harroun Foster 2006, 191).

Yet, the return to Canada was a return to scarcity and the Métis' hunts remained unsuccessful. Those at Wood Mountain were soon forced to fast to preserve the little remaining food and later to kill a colt to avoid

starvation. Adding to their difficulties, a large fire swept through the region, burning hay and trees (F.T. Hugonard to Taché 25 November 1879; C.S.P. 1880, 15; Willow Bunch Historical Society 1998, 626).

The Location for Agricultural Settlement

The impossibility of hunting in the United States and the lack of buffalo in Canada necessitated a change of lifestyle. William or Guillaume Klyne became the first to settle in Willow Bunch Valley, in 1879. It has been said that André Gaudry also settled in the valley before 1880 (Homestead Files [H.F.] 690072; Rondeau 1923, 105-106; Hawkes 1924, 1048, Willow Bunch Historical Society 1998, 595). Because of the fire, that spring and summer the Métis at Wood Mountain found little grass to feed their livestock. The winter that followed was hard and cold, with many blizzards. Nonetheless, as usual, Jean Louis Légaré held a New Years' party. At the party, André Gaudry proposed that the other Métis settle alongside him. He described Willow Bunch Valley's attractions, its beauty, hay, wood and water, a location where they might raise livestock rather than hunt buffalo (Rondeau 1923, 105-106; Hawkes 1924, 1048; Willow Bunch Historical Society 1998, 595). Poor, alkali soils were the only characteristic that made this site unusual among squatter settlements, but the Métis chose it for livestock raising and favoured its attributes of shelter and water rather than land that was fertile for crop growing (Hamilton & Hamilton ca. 1952, 90; Grismer 1980).

Early Settlement Patterns

Although satisfactory, class 3, land was available in the valley, the Métis chose to settle on land that was poor for growing crops (Figures 5 and 6). When John Bourgeois and F.E. Brunelle surveyed the area in 1886, they found most of the Métis who had settled[9] on class 6 land.[10] Class 6 land has no capacity for crop growing and has limits for grazing.[11] Moreover, the Métis had located on the southern slope of Willow Bunch Valley, often in coulees, on land that was likely partially covered with bush (Figure 7) (Surveyors Township plans; Fieldwork 2004).

Like the general location of the settlement, individual Métis settlers had probably chosen their land for its advantages for raising livestock. Their patent applications confirm this possibility. When he applied to patent his homestead, Louis Dumais wrote of the Métis' intent to raise livestock, especially since farming was impractical at Willow Bunch at this

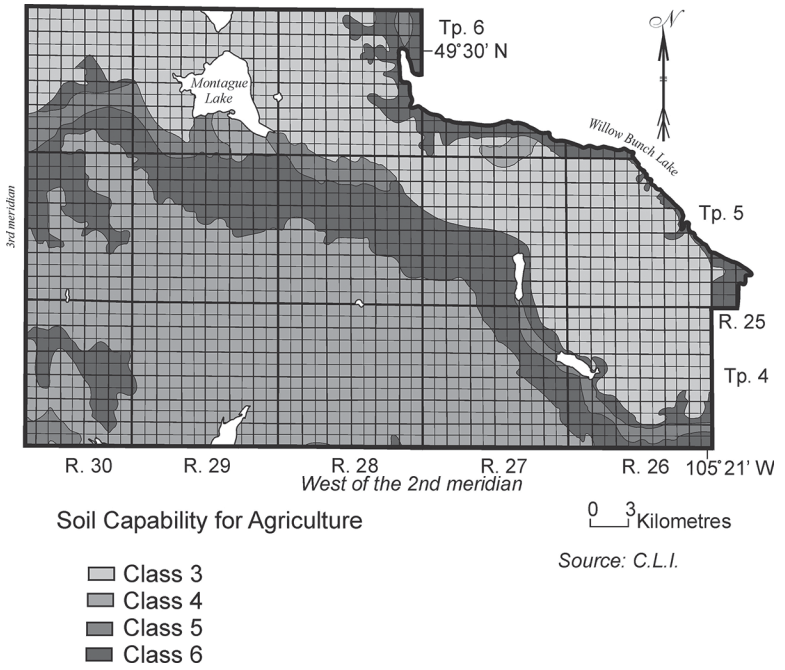


Figure 5: *Soils at Willow Bunch.*

time: "This country is useless for any purpose except stock, cultivation except on a very small scale, is out of the question" (H.F. 675609). The lack of a railway, although as of 1883 the Métis and other settlers attempted, though unsuccessfully to obtain one, also affected the Métis' land use choices and potentially their land selections (Statutes of Canada 1883 The Regina Leader June 5 1884; September 21 1886). With 90 kilometers to travel to the nearest railway, Narcisse Lacerte wrote: "I did not crop more land because we have no market where to sell the product" (H.F. 683758; Rondeau 1923, 187). Other homestead declarations showed the Métis' emphasis on livestock. Many had numerous animals, and buildings needed for raising livestock. Zacharie Chartrand Senior, for example, had an average of 14 horses, 45 cattle and 600 sheep annually in his first years of settlement at Willow Bunch (H.F. 701431). Others, including Elzéar Bottineau, with an average of 18 horses and 4 cows annually, had smaller herds (H.F. 1929986). William Klyne, on the other hand, with 21 acres in crop, cropped more land than any other Métis settler (H.F. 690072).

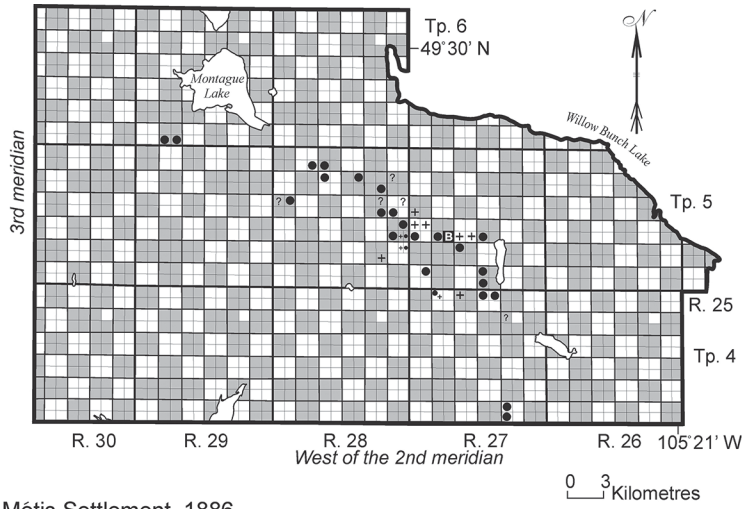


Figure 6: *Métis homesteaders at Willow Bunch, 1886.*

Moreover, although they located along the base of Willow Bunch Valley, the Métis did not appear to have attempted to transfer the river lot pattern of settlement from Manitoba.[12] They settled in coulees which were scattered along the valley and the areas that they broke were of assorted shapes. This pattern of land settlement appeared to result from their seeking advantages of such landforms rather than from an attempt to transfer a river lot settlement pattern. Also, they did not settle according to the Dominion Government's township survey, and some claimed school, Hudson's Bay or railway land; this too appeared to have been a selection of land that was advantageous for their purposes, of livestock raising[13] (Rivard and Littlejohn 2003, 209).

The 1880s were very difficult years for the Métis at Willow Bunch. Many continued hunting (Manuscript Census [M.C.] 1881). Their success was limited. Although the hunt of 1883 was more fruitful than that of 1881,

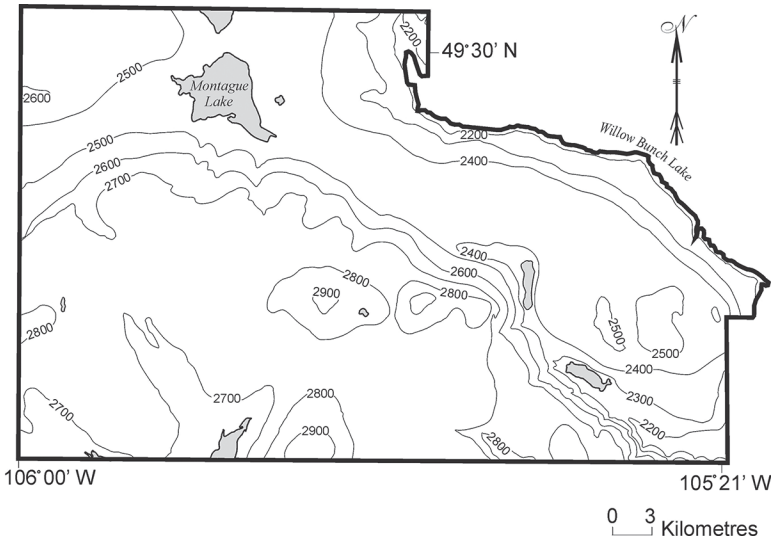


Figure 7: *Topography*

by 1884 buffalo no longer came to the Willow Bunch area. Métis who continued to hunt were forced to hunt ducks, wolves and other smaller animals; these were less secure sources of food (F.T. Germain to Taché December 1882; September 28 1883; 3 March 1884; *The Regina Leader* March 8, 1883; Lapointe 1920; Giraud 1986, 415). Some Métis replaced the hunt with picking buffalo bones. These bones were used to refine sugar and as phosphate in fertilizer; they yielded $4-$8 a ton. However, after only a few years, the plains were picked clean of this remnant of the great herds (McGowan 1975, 23; Potyondi 1995, 37). Others took on a variety of jobs, freighting, paving streets and working as scouts during the resistance at Batoche (*The Torch*, n.d., 29; Armstrong 2000, 29; Rivard and Littlejohn 2003, 203). Those who had settled on land attempted to grow vegetables, crops and to raise livestock. However, the weather was poor during many of the early years. Winters were severe. Moreover, in 1884, frosts came early. In 1885, fires and grasshoppers ravaged crops. Droughts and livestock losses were significant in 1886-1887, and, horse theft was common throughout the decade (White 1886 Lands Branch [L.B.] 111072; *The Regina Leader* 12 April 1887; Légaré c. 1914, n.p.; Lapointe 1920, n.p.; Warkentin 1974, 53; Mason and Poirier 2000, 112-113; Rivard and Littlejohn 2003, 206).

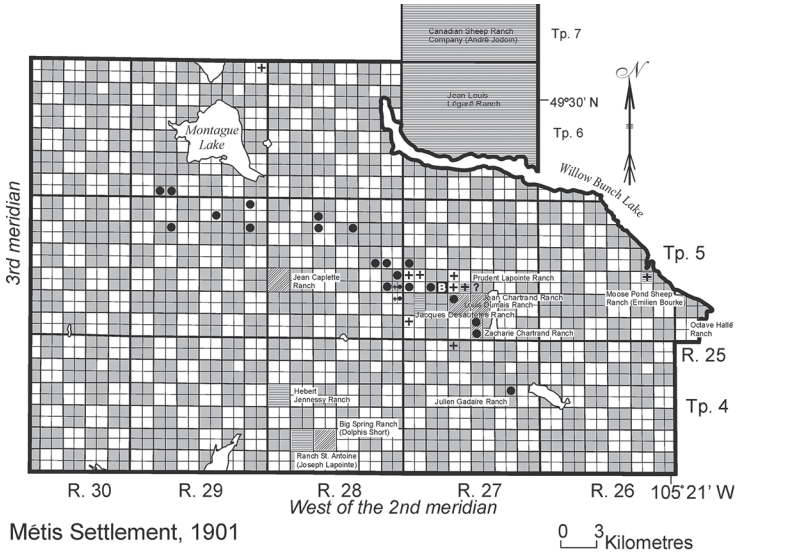
This situation likely affected the land settlement pattern as many Métis took their scrip as money scrip or sold their land scrip (Légaré c. 1914). It also contributed to much turnover within the community. Just 6.4% of those recorded in the 1881 census were still in the area in 1891 (M.C. 1881, 1891). While the high degree of turnover left full aspects of land settlement at this time unknown, those who would go on to form the core of the community were among those who remained on the land.

The 1890s also brought periods of hardship. Droughts affected the community in 1892, 1893 and 1894. Livestock losses were significant in 1893. These difficult years that followed those of the 1880s contributed to the closure of the community school (C.S.P. 1890, 98; 1893, 80; 1895, 88; Fonds Langevin [F.L.] Lapointe to Langevin, 5 July 1897). However, unlike in the previous decade, potentially as a result of the end of other alternatives, the population at Willow Bunch stabilized: 80.6% of Métis household heads recorded in 1891 were present in 1901 (M.C. 1891, 1901). Nonetheless, a lack of information prevented analysis of developments in their land settlement pattern.

Even so, from the information that could be located, the settlement in 1901 appeared to follow the previous pattern (Figure 8). Most Métis continued to make their homes along the south side of Willow Bunch Valley. A few others, however, had been quite successful despite the adverse conditions. They had extensive ranches; this was also a reflection of the transition in the community from hunting and other activities to raising livestock. Others Métis appeared to live in the village (M.C. 1901). Still, despite the survey, none of the Métis had entered for land (Township Registers).

The Métis began making entries between 1901 and 1905. These entries followed their earlier settlement pattern. They were often for poor land that was suitable for ranching.

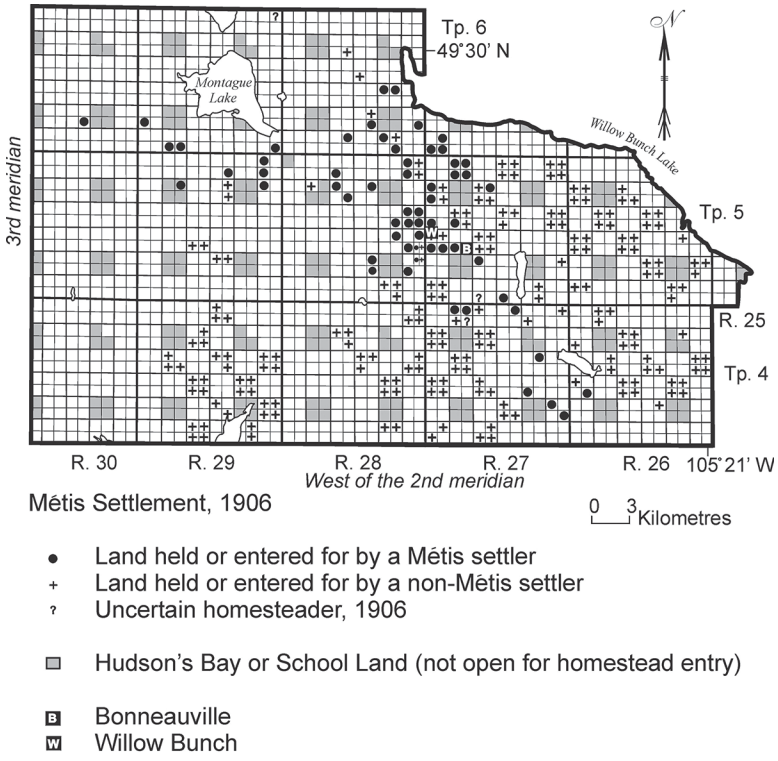
They continued entering in 1906, expanding their settlement, mostly to the north, in Willow Bunch Valley, though a few claimed land south of the valley (Figure 9). However, unlike those who selected land earlier, the Métis who chose land in 1906 frequently took relatively good, class 3 or 4, land: 20.0% of those who made entries between 1901 and 1905 claimed class 3 or 4 land, 73.1% of those who settled in 1906 claimed class 3 or 4 land. A significant number of other settlers also entered in 1906. While this may have affected the direction of Métis settlement, it did not explain the change in the sort of land that they selected. Non-Métis newcomers generally chose good farm land; there was no lack of class 6 land that had the attributes that the Métis had previously sought (Lautier 1973). Also, railways did not affect this settlement pattern as the first railway to Willow Bunch was built in 1926 (The Morning Leader November 22, 1926; Drake



Sources: Homestead Files; 1901 manuscript census; R.G. 15, vol. 1241, file 400831

Figure 8: *Métis homesteaders at Willow Bunch, 1901.*

1950). On the other hand, it may be contended that those who entered in 1906 sought land with greater farming possibilities than earlier entrants and were prepared to forego bush and running water, both amenities for livestock raising that had contributed to their earlier choices, in favor of better farmland. Indeed, their activities on the land suggested that they may have selected land to farm. Those who entered for land in 1906 broke and cropped more land than those who had entered earlier (Table 1). Also, those who entered on class 3 or 4 land in 1906 had fewer cattle and horses than others who had entered earlier. On the other hand, although many entered on class 3 or 4 land, some entered on class 5 or 6 land. Those who



Sources: Homestead Files; Township Registers; 1901 manuscript census; 1906 manuscript census

Figure 9: *Métis homesteaders at Willow Bunch, 1906.*

entered on class 5 or 6 land still had large herds. This suggests that land was selected differently in 1906 than it had been in the years before 1906. Several who entered in 1906 chose land that they could farm; before this the Métis had selected land for raising livestock. Others, however, continued selecting land to raise livestock.

Yet although several Métis who entered in 1906 chose better land than other Métis who homesteaded earlier, and many appeared to have chosen land for farming, they did not choose the best land possible. In 1906, much better farmland, that was closer to railways, was still available in western Canada. For those Métis who entered in 1906, remaining in the same community as other Métis settlers appeared to have been a priority;

Table 1: *Breaking, crops and livestock holdings of Métis homesteaders, 1879-1906.*

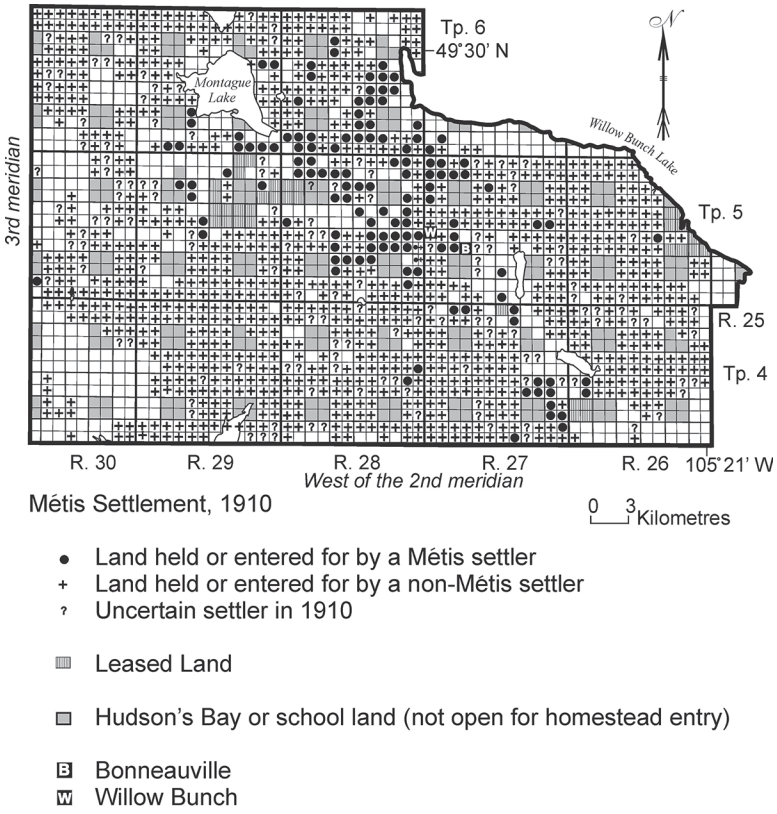
Year	Soil Class*	Average Age at Entry (years)	Average Area Broken at Homestead Patent Application (acres)	Average Area in Crop Annually (acres)	Average Number of Horses/year	Average Number of Cattle/year
before 1901	3 or 4	34.0	none patent	none patent	none patent	none patent
before 1901	5 or 6	30.5	12.8	10.9	19.4	26.3
1901-1905	3 or 4	46.0	8.7	5.7	12.8	16.5
1901-1905	5 or 6	43.5	14.8	5.7	11.7	10.5
1906	3 or 4	36.3	29.5	14.7	6.1	5.7
1906	5 or 6	33.1	32.6	21.6	13.5	10.4

Source: Homestead Files * soil class on the homestead

they opted to remain near their compatriots ahead of choosing land in another district where there were no other Métis people.

Métis people continued entering for land between 1907 and 1910 (Figure 10). They more frequently took relatively good land than in the years before 1906, but the definite tendency to take class 3 or 4 land did not continue. In 1907, 54.5 % of the land that the Métis took was class 3 or 4; in 1908, 1909 and 1910, 87.5%, 57.1% and 53.3% of the land entered for was class 3 or 4.[14] Several explanations were considered. Certainly, as other settlers came to Willow Bunch and usually claimed the better land, less good land was available. Nonetheless, although other homesteaders eventually surrounded the Métis, some class 3 or 4 land was available in the community for several years. Table 2 shows their activities on the land while earning patent and their average age at entry. There was a clear tendency for those who entered on poor land in 1907 to raise livestock while those who entered on better land grew crops. However, all who entered between 1908 and 1910, even those who took poor farmland, broke and planted larger areas to crop and had fewer livestock than the first Métis settlers. This followed the general trend, towards crop growing, in the area (Rondeau 1923, 209-210). Yet, this also showed that while Métis who entered in 1907 may have chosen poor farmland for raising livestock, later entrants did not choose land to raise livestock.

Since the Métis did not appear to take land to raise livestock other possibilities were considered. Secondary sources revealed that although Métis people began entering for land soon after other settlers came some, despite the arrival of other settlers, held the land that they had lived on and used for several years, but did not enter. Yet, they were at little risk for losing the land as it was often poor for farming and little desired by other



Sources: Homestead Files; Saskatchewan Land Titles; Township Registers; 1901 manuscript census

Figure 10: *Métis homesteaders at Willow Bunch, 1910.*

homesteaders (Lautier 1973). It was considered that if delayed entry for poor land that had been held for some time explained the entries for poor land then the Métis who entered for poor land, and who would have lived in the area for several years, would have been older than those who took better farmland. Table 2 shows that this was sometimes the case; on average, entrants for class 5 or 6 land were older than those who took class 3 or 4 land. Still, the data showed that some younger Métis took poor land; delayed entry by older settlers who had lived on land but who had not entered for it did not fully explain the pattern.

Table 2: *Breaking, crops and livestock holdings of Métis homesteaders, 1907-1910.*

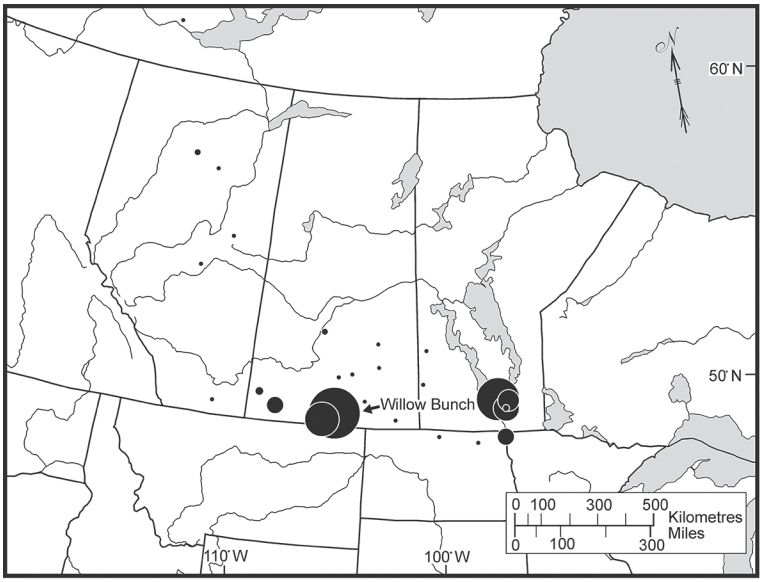
Year	Soil Class*	Average Age at Entry (years)	Average Area Broken at Homestead Patent Application (acres)	Average Area in Crop Annually at Homestead Patent Application (acres)	Average Number of Horses/year	Average Number of Cattle/year
1907	3 or 4	30.6	31.9	16.5	3.5	1.1
1907	5 or 6	37.4	17.2	11.3	8.2	11.3
1908	3 or 4	28.4	32.3	19.2	4.2	0.2
1908	5 or 6	18.0	68.0	30.0	3.0	0.0
1909	3 or 4	32.3	40.8	23.3	0.7	0.7
1909	5 or 6	36.8	35.3	18.5	4.1	0.7
1910	3 or 4	25.0	45.3	26.6	3.2	0.0
1910	5 or 6	32.8	41.8	25.1	3.6	0.6

* Average soil class of homesteaders' entries, average land use statistics calculated for homestead land quality

Source: Homestead files

Thus, there is no clear evidence that poor land was selected, especially after 1907, for raising livestock. The slightly greater number of animals owned by those on poor land may have resulted from their recognition that the land was only good for raising livestock as much as it may have reflected a choice of land to raise livestock. Moreover, delayed entry did not fully explain the pattern. On the contrary, as shown in Figure 10, clusters of Métis settlers developed, around those who had entered by 1905, and around those who had settled in 1906. It is contended that Métis settlers sought land that was near other Métis people and thus clustered. Because of the location of earlier clusters, usually in the valley where some land was relatively good but other land was poor, and because other settlers arrived and took better land, some Métis had to choose poor land to remain near other Métis people.

The amount of good land available elsewhere declined too, though land that was at least class 3, and nearer to a railway, remained available for many years, if homesteaders will willing to disperse and take land where they could. Again, it appeared that many Métis preferred to stay in a community, with other Métis, rather than to take land, that would have had greater economic advantages, elsewhere. These preferences, to locate with other Métis, led them to locate within the community and, it appeared, to locate alongside other Métis, even if this meant taking less than optimal land.



Number of Adults (18 years or over)

1
2
3
5
6
7

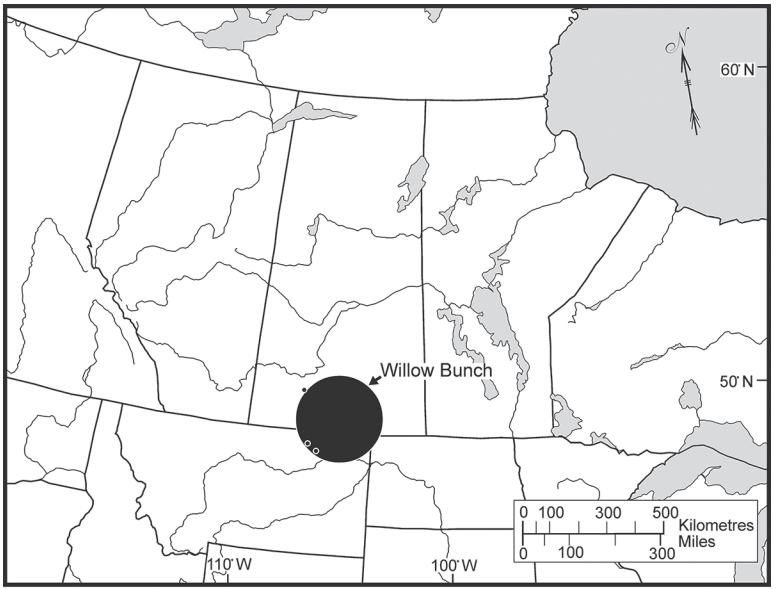
12
15
23

Manitoba (undifferentiated) = 32
Canadian Northwest (undifferentiated) = 24
Manitoba or Canadian Northwest (undifferentiated) = 6
United States (undifferentiated) = 7
Total = 166

Sources: Morin 1998, 1901 manuscript census, Métis scrip claims

Figure 11: *Birthplace of Métis adults at Wood Mountain, 1901.*

The advantages of taking land at Willow Bunch and clustering, to be near other Métis, were likely enhanced by the possibility of remaining with others who were known, or at least who came from common places. Figures 11 and 12 show the origins of the Métis who were at Willow Bunch in 1901. Because of the high turnover, especially during the 1880s, the community in 1901 differed substantially from that of 1870-1871. However, again, most adults came from a few common origins: many were born in Saint François Xavier. Some were born at Saint Norbert and Winnipeg/ Saint Boniface. Many more were descendants of families who had spent time at Wood Mountain/Willow Bunch and were born at Wood Mountain or Willow Bunch. Only a few were born at Pembina, Cypress Hills or at various other locations in the Northwest.



Sources: Morin 1998, 1901 manuscript census, Métis scrip claims

Figure 12: *Birthplaces of Métis children at Willow Bunch, 1901.*

Certainly, there remained factors at Red River that promoted emigration. Farming conditions continued to be poor, land titles were insecure and some may have sold their land at Red River during the boom at Winnipeg during the early 1880s (Mailhot and Sprague 1985, 4; Flanagan 1991). But, this pattern of origins, with many coming from a few places, suggests that many people who settled at Willow Bunch may have known each other before they migrated to the community. Recollections suggest that at least a few came through processes of chain migration, to join relatives, and to ranch (Price 1959, 271; Willow Bunch Historical Society 1998, 419, 512). Those who were born at Willow Bunch were returning to a community where they had been before. Others appeared to gravitate to the community where other Métis had settled (Price 1959, 271). On the other hand, as the

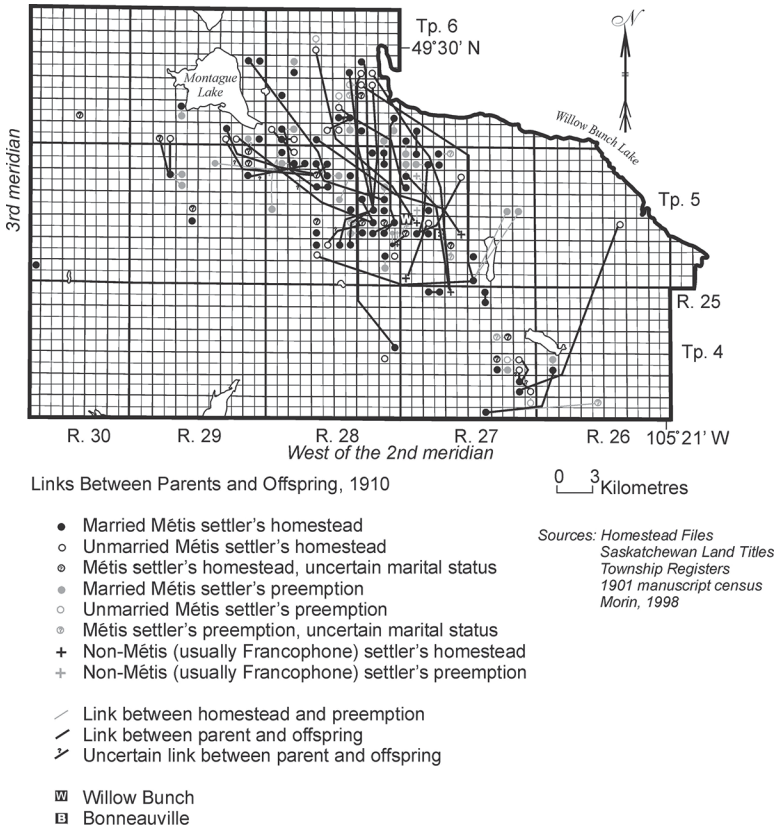


Figure 13: *Links between Métis parents and children at Willow Bunch, 1910.*

Métis people were very mobile at this time,[15] many who were not from the most common birthplaces, may, despite their dispersed origins, have come into contact with each other prior to settling; they too may have come through the process of chain migration. Still, in all cases, by the time the Métis at Willow Bunch took land, they were well acquainted and many had intermarried.

Remaining near family was another advantage of persisting at Willow Bunch. Figures 13 and 14 show links between family members, within the community. Like the Métis population at Batoche, the map reveals that most Métis at Willow Bunch were related[16] (Payment 1986; Rivard and Littlejohn 2003, 20). In fact, very few who were at Willow Bunch in 1910 could not be linked to another Métis settler, as parents and offspring or

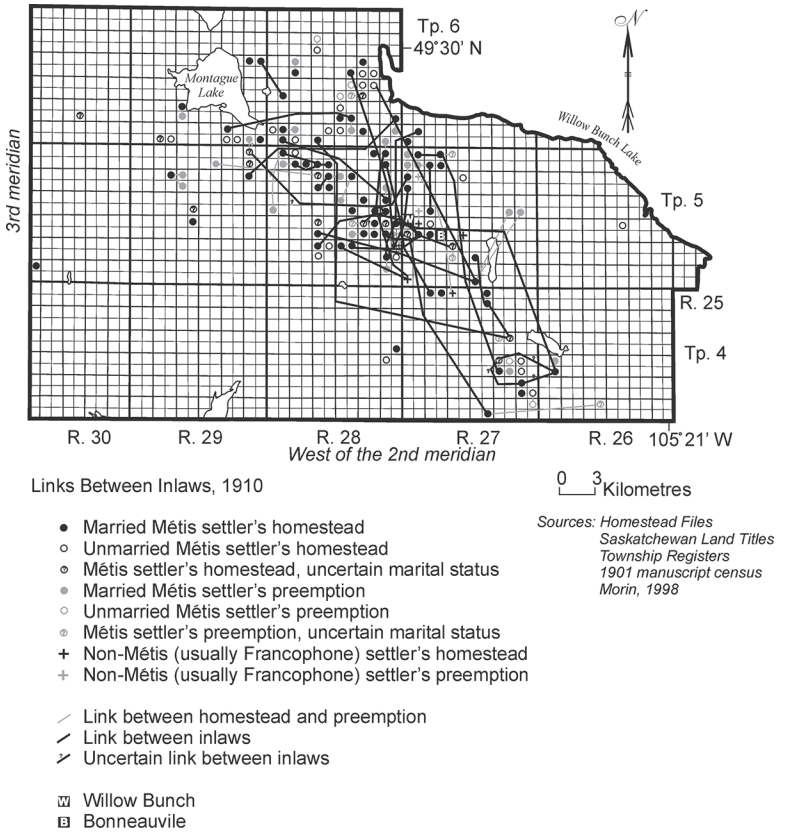


Figure 14: *Links between Métis in-laws at Willow Bunch, 1910.*

through marriage before or after settlement. On the other hand, within the settlement, some families clustered, with most members having taken land near one another, but many had dispersed, with family members having taken land at some distance from each other. This pattern appeared unusual as many studies of ethnic settlement have shown a tendency for families to take land together.[17] However, at Willow Bunch, typically, members of the senior generation had chosen land in the early years of settlement, and had taken poor land, along the edge of the valley and on its walls, for raising livestock. On the other hand, some of their offspring, who entered in 1906 and afterwards chose better land, even if it meant locating at some distance from family. Still, the clusters that developed over the next years were not necessarily family based clusters; members of several families grouped together. It appeared that while family and common origins may

have added to the incentive to stay at Willow Bunch and that while within the community settling near other Métis was a priority, it was not crucial to settle directly alongside family or beside others from common places.

Finally, although clusters developed, unlike some other groups, such as the Ukrainians who clustered along religious lines (Lehr 1999), there appeared to be no other factors that led to segregation within the community. Most of the Métis who came to Willow Bunch, like their compatriots elsewhere, were Roman Catholic. Rivard and Littlejohn (2003, 20) traced 23 families back to Saint François Xavier in 1827. Nineteen of these families were headed by Roman Catholics and four were headed by Protestants. However, the 1901 census identified all Métis at Willow Bunch as Roman Catholic (Canada 1901). Thus, it was assumed that all Métis were Roman Catholic when they entered for land. At the same time, family names indicated that, while most Métis at Willow Bunch were French Métis, some were English. However, these differences of origins did not lead to segregation within the community. This, perhaps, is not surprising. Although English and French Métis were initially separate and worked for different trading companies, the two communities had begun to integrate in the early years of the fur trade (Clarke 1997). Moreover, English and French Métis at Willow Bunch had intermarried, both before and after they arrived in the community (Métis scrip, Morin, 1998).

The lack of segregation by religion, by French or English background, or by family at Willow Bunch suggested that the Métis had developed a cohesive community. Entering for land near other Métis people was of prime importance. The Métis forewent better land elsewhere to remain with their people at Willow Bunch. Within the community they also took land alongside other Métis even though better land was available, at some distance from other Métis people, but still within the settlement. The social advantages of settling with members of a common ethnic group are well documented.[18] At Willow Bunch, like in other communities, these advantages likely contributed to the pattern of land selection. However, at Willow Bunch, this tendency may have been enhanced by the arrival of large numbers of Francophones and other homesteaders. Shortly after the turn of the century, and especially after 1906, Francophones came to dominate the culture of the community. Activities at Willow Bunch shifted from those reflecting Métis culture to those centered around French Canadian organizations, such as the Saint-Jean Baptiste, the Chevaliers de Colombe, the Dames de Sainte Anne, the Congrégation des Enfants de Marie and the Association Catholique de la Jeunesse Canadienne.[19] These organizations were foreign to the Métis. Moreover, and likely more importantly, these organizations often excluded them.

At the same time, racism appeared with the Francophones' and other settlers' arrival (Préfontaine, Young, Paquin and Dorion 2003).[20] The development of clusters of Métis, and the selection of land to be alongside other Métis, even if it carried significant economic disadvantages was likely an effect of, and a response to the coming of a new culture that marginalized and excluded the Métis. Even the land selections in 1906, which were for better land, and that at times involved settling at some distance from co-nationals, did not fully contradict this pattern. Most of these selections were ahead of the general settlement frontier and were made before the Métis were surrounded by other homesteaders.

Still, the Métis settlement at Willow Bunch displays several characteristics that were typical of prairie ethnic settlements. The settlement was largely of families, of people from common origins, and of people who knew each other. Those who settled at Willow Bunch had initially hunted together, but the decline of the buffalo had forced them to settle or to take up and alternate activity. When they settled, they settled together. Though situations have differed, many groups of settlements have displayed similar tendencies; families, people from common origins and acquaintances often settled together on the prairie frontier. Chain and gravitational migration were common processes that brought these settlements together, and they contributed to bringing the Métis together at Willow Bunch.[21] Moreover, the Métis' preference to stay in the area, despite its economic disadvantages, is not unlike other groups. Several groups have settled together, and later comers have joined existing settlements, because of the social advantages of settling with family, acquaintances and countryfolk, even if settling alongside those they knew and co-nationals meant settling in a less than optimal area.[22]

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Endnotes

1.Schlichtmann (1977) reviewed numerous factors affecting ethnic group location in Western Canada. These factors are usually addressed in work on ethnic settlement.

2.For and example of settlers at Pembina Mountain, Manitoba see Richtik (1985), for Scots see Lewry (1986), for Germans and Scandinavians see Boyd (1989), for Swedes see Ostergren (1998), for Ukrainians see Lehr (1999), for Francophones see Hamilton (2007).

3.Prices for buffalo robes rose from $3.00 in 1846, to $3.50 in 1856, and to between $5.50 and $6.00 in the 1870s (Hildebrandt and Hubner 1994, 36).

4.Secondary sources debate whether or not this move, of a group of Métis occurred, and debate the number of Métis involved (Légaré c. 1914, n.p.; Rondeau 1923, 12, 30; Chabot 1970, 225; Potyondi 1995, 29-30).

5.Pakan, for example, provided protection from the Blackfoot, a First Nation with whom the Métis were not friendly (Ironside & Tomasky 1971, 20). On the other hand, Sainte Anne was situated "... deep in the country of the Crees and Assiniboines, where it could escape the frequent clashes between the Crees

and Assiniboines, on one hand, and their age-old enemies, the tribes of the Blackfoot Confederacy, on the other" (Moodie 1965, 36).

6. Secondary sources usually mention Saint François Xavier as the origin of the Willow Bunch Métis (Rondeau 1923 12, 30; Rivard and Littlejohn 2003).
7. This finding concurs with others. For example, Payment (1986) found that many who settled at Batoche were related.
8. Specifics regarding the migrants' background at Red River were not traced.
9. Surveyors' field notes, township plans and homestead entries show that many Métis settled in the late 1800s, although they did not enter for land until the early 1900s.
10. Later homestead claims suggested that between 1879 and 1886 the Métis consistently settled on class 6 land at Willow Bunch.
11. Likely both maps are incomplete. In the winter of 1880, Father Saint Germain recorded thirty families in the area (Rondeau 1923, 106). In 1886, there were forty or fifty people in the community (Légaré 1886, L.B. 114778). The transiency in the community and the use of the homestead files and surveyor plans influence the incompleteness of the maps.
12. Immigrants' transfer of aspects of the cultural landscape is a traditional interest of cultural geography. Mannion (1974), for example, examined Irish migrants' transfer of various aspects of their material culture to Canada.
13. Land was held for the Qu'Appelle Long Lake and Saskatchewan Railway until 1902 (Porter 1902, L.B. 400831).
14. These statistics are the average quality of the land entered for by each Métis homesteader.
15. As they followed the few remaining buffalo.
16. Rivard and Littlejohn (2003, 20) described the community as a group of extended relatives in their history of the Willow Bunch Métis.
17. For example, Lewry (1986) or Richtik (1985).
18. For example, Lehr (1999), Pedersen (2004) and Pyée (2005).
19. Tessier (1974) described the development of Francophone cultural activities at Willow Bunch.
20. A similar pattern was noticed by Pyée (2005) in her thesis on Notre Dame de Lourdes and Saint Claude, Manitoba.
21. Many studies of prairie settlement have noted the extent of chain migration and its importance in forming ethnic bloc settlements. For an example of Swedes see Ostergren (1979), for Icelanders see Richtik (1986), for those previously resident in the United States see Widdis (1997), for Ukrainians see Lehr (1996), for French see Sylvestre (1997) and Pyée (2005).
22. A similar pattern is evident in other ethnic group settlements. In order to remain near co-nationals and those they knew, settlers often took up poorer land than what might be available elsewhere. For an example of Jews see Fox (1979, 83), for Ukrainians see Lehr (1985 and 1999, 355), for Fins see Pedersen (2004, 39-41).

Urban Aboriginal settlement patterns and the distributions of housing characteristics in large prairie cities, 2001

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Abstract: This paper explores the relationship between settlement patterns of Aboriginal people in large prairie cities and the distribution of selected housing characteristics. Early models of immigrant settlement patterns assumed that generally immigrants settled in inner city neighbourhoods and dispersed to suburban areas as they adjusted to urban life. More recent work argues that this pattern can not be generalised and that settlement patterns are related to housing characteristics. As a result, there are variations across cities. While urban Aboriginal people are not immigrants, it is useful to explore whether their settlement patterns are also related to the distribution of housing characteristics across urban spaces. Our analysis shows that Aboriginal settlement patterns in large prairie cities are related to particular housing characteristics. However, we also found that housing characteristics, Aboriginal settlement patterns, and the relationships between them vary across cities. This underscores the importance of understanding particular situations in different cities.

Canadian geographers and sociologists have studied the residential patterns of different cultural and ethnic groups in Canadian cities for several decades (Murdie 1969; Walks and Bourne 2005). While some of this work has described cities across Canada, the three largest cities in Canada – Montréal, Toronto and Vancouver – have received the most attention (Bauder and Sharpe 2002). In the prairies, Aboriginal[1] people

[1]Within the context of this research, Aboriginal refers to the indigenous population of Canada. Included are First Nations (Indian), Métis and Inuit. It is important to note these are legal definitions that do not reflect the range of diverse nations within the population, and in many cases these are not how Aboriginal people refer to themselves.

represent a growing component of urban populations, and in many urban areas they represent the largest minority population. Although there is some recent academic work that describes their distributions in urban areas, we still do not have a good understanding of the factors affecting these patterns (Maxim et al. 2003; Heisz and McLeod 2004). The possibility that there are different patterns in different cities is also not well recognized. Media treatments, especially, often present urban Aboriginal circumstances as if they were similar in all urban areas. Yet recent analyses show that the situation of the Aboriginal population varies substantially in different cities (Peters 2005; Siggner and Costa 2005).

In Canada, a number of researchers have suggested that the characteristics of the urban housing stock affect the residential patterns of ethnic groups (for example Fong 1996; Bauder and Sharpe 2002;). This paper addresses the residential distribution of Aboriginal people in relation to the housing characteristics of large prairie cities. Clearly Aboriginal people in cities are not immigrants. They represent the indigenous population of Canada. However models of immigrant residential settlement patterns represent a useful point of comparison with Aboriginal residential patterns. The first section below reviews work on immigrant residential patterns and housing with a focus on Canadian cities. Then we summarize existing material on Aboriginal urban residential settlement patterns. A description of our data and methods follows. Results are presented in the fourth section, and we summarize some of the implications of the analysis by way of conclusion.

Immigrant Residential Patterns and Housing

In 1925, Ernest Burgess introduced what was to become a classic model of immigrant settlement patterns in North American cities. Suggesting similar people tended to live near each other, he developed the concept of residential segregation as something inherent to the city, stating:

> This differentiation into natural economic and cultural groupings gives form and character to the city. For segregation offers the group, and thereby the individuals who compose the group, a place and a role in the total organization of city life. (1925, 56)

Burgess suggested that immigrants first settled in a "zone of deterioration" near the central business district. As they assimilated, they eventually dispersed into suburban areas. This model of immigrant settlement patterns was seen as a generalisable model to all immigrant

groups and North American cities, and it has had a longstanding influence on urban studies (see for example Lieberson 1963; Clark 1998). However, this model is based on certain assumptions about the nature of the immigrant group and the receiving city (Burnley and Hiebert 2001). It assumes that the group has the social and economic capacity to be economically mobile (Warner and Burke 1969; Ward 1971; Yancey et al. 1976). It also assumes that the relationship between the immigrant group and the host society allows for eventual integration. As Boal (1999) points out, there are a variety of outcomes for immigrant groups associated with attitudes of the host society toward them. Other research has shown that improvements in socio-economic status do not necessarily translate into spatial advantages for all immigrant groups (Fong 1996; Fong and Guila 1996; Fainstein 1998). Finally, the model assumes a particular housing distribution in the receiving city, with low cost housing of sufficient quantity, close to employment, to facilitate the development of immigrant enclaves (Yancy et al. 1976). Burnley and Hiebert (2001, 127) point out that the model assumes "a linear relationship … between housing cost and distance from the city centre, such that the least expensive housing is in inner-city neighbourhoods". In other words, there are mediating factors that influence residential settlement patterns of minority groups. These include the nature of urban economies, group capacity, attitudes toward particular minority groups, and the housing structure of the city. This paper focuses on the latter.

In the Canadian literature, a number of researchers have demonstrated that the spatial distribution of housing affects the residential settlement patterns of various ethnic, cultural and immigrant groups. Fong's (1996) comparison of residential segregation in American and Canadian cities found that segregation was related to the age of the city because of the intensifying effect of the concentration of less expensive, older housing stock at the centre of older cities. His 1997 study showed that in cities with a larger proportion of older housing stock, the proximity of racial and immigrant groups to French and British groups decreased. Others have confirmed that immigrant settlement patterns in Canada are closely related to their circumstances in the housing market (Ray and Moore 1991; Ray 1994, 1998, 1999; Ray et al. 1997). Bauder and Sharpe's (2002) exploration of the residential segregation of visible minorities in Vancouver, Toronto and Montréal found that the location quotients of visible minority populations were correlated with the location quotients of various housing variables. They concluded that levels of segregation and integration were related to local housing characteristics. Recently Walks and Bourne (2005) suggested that the concentration of apartment districts affected segregation levels of visible minorities. While some of these researchers

included Aboriginal populations in their analysis, there has been no focus on the relationships between housing characteristics and the residential location of Aboriginal people.

Aboriginal Settlement Patterns in Cities

In the 1940s, relatively few Aboriginal people lived in cities in Canada (Kalbach 1987). Since then, the urban Aboriginal population has increased steadily. According to the 2001 Census, 49.1 percent of Aboriginal people lived in urban areas, with about one quarter of the Aboriginal population in ten of Canada's census metropolitan areas[2] (Statistics Canada, 2003). Table 1 describes changes in the Aboriginal populations in Canada's CMAs with more than 10,000 Aboriginal people in 2001. While changes in census definitions over the years make it impossible to compare these statistics directly, they nevertheless demonstrate trends with respect to the changing size of the urban Aboriginal population. With the exception of Vancouver, cities on the prairies have experienced the largest increase in Aboriginal populations since the mid-1900s. Aboriginal populations also comprise the largest minority populations in many prairie cities. While Table 1 summarizes dimensions of the changing size of urban Aboriginal populations, it is difficult to obtain a clear sense of Aboriginal settlement patterns within cities from existing research, and what factors are associated with these patterns.

There are conflicting accounts about the extent to which Aboriginal people are segregated in Canadian cities. Early work on Aboriginal urbanisation assumed that Aboriginal migrants would concentrate in inner cities (Melling 1967; Braroe 1975; Decter 1978;).[3] Other research suggested that Aboriginal people were scattered throughout urban areas even in the 1960s and 1970s (Davis 1965; Nagler 1970; Dosman 1972; Krotz 1980;). The lack of Aboriginal concentrations in the city and assumptions about the role of neighbourhoods in facilitating adaptation, generated several projects to encourage urban Aboriginal people to concentrate in

[2] A Census Metropolitan Area (CMA) is a very large urban area, together with adjacent urban and rural areas which have a high degree of economic and social integration with that urban area. It is delineated around an urban area that has a population of at least 100,000.

[3] In the 1980s, many urban Aboriginal non-profit housing organizations (supported by a CMHC Native housing program) attempted to disperse Aboriginal households throughout the city (Lipman, 1986). This program was halted in the early 1990s, though, so current settlement patterns cannot be attributed only to this initiative.

Table 1: *Aboriginal people in selected[4] Census Metropolitan Areas, 1951-2001[5]*

	1951	1961	1971[6]	1981	1991[7]	2001	Percent Change, 1951-2001[8]	Percent of CMA Aboriginal 2001
Montreal	296	507	3215	14450	6775[9]	11275	3,709.1	0.3
Ottawa-Hull	--	--	--	4370	6915	13695	n/a	1.3
Toronto	805	1196	2990	13495	14205	20595	2,458.4	0.4
Winnipeg	210	1082	4940	16575	35150	55970	26,552.4	8.2
Regina	160	539	2860	6575	11020	15790	9,768.8	8.0
Saskatoon	48	207	1070	4350	11920	20455	42,514.6	8.8
Calgary	62	335	2265	7310	14075	22110	35,561.3	2.3
Edmonton	616	995	4260	13750	29235	41295	6,603.7	4.3
Vancouver	239	530	3000	16080	25030	37265	15,492.1	1.9

Sources: Department of Indian Affairs and Northern Development 1985.
Statistics Canada.1974: 244
Statistics Canada 1991
Statistics Canada 2003

[4] These were CMAs with Aboriginal populations of more than 10,000 in 2001.
[5] The 2006 Census data are not available yet.
[6] The 1971 data do not include the Inuit.
[7] In 1991 and 2001, these statistics refer to individuals who identified with an Aboriginal group. Counts for previous years refer to individuals with Aboriginal ancestry. Because of changes in the questions on which these counts are based, and changes in definition and collection methods, statistics are not strictly comparable between years before 1991.
[8] The percent of change in the size of urban Aboriginal populations is presented for heuristic purposes only. The definition of Aboriginal was different in 1951 than in 2001.
[9] Montreal, Calgary and Vancouver had, within their boundaries, reserves that were incompletely enumerated in either 1991 or 2001 or both, affecting the counts for those years and cities.

neighbourhoods in ways assumed to be typical of immigrants to urban areas (Dosman 1972; Damas & Smith Ltd. 1975; Svenson 1978). Some contemporary accounts also assume that Aboriginal people are segregated in urban areas (Drost 1995; Kazemipur and Halli 2000; Richards 2001). Media accounts support this impression, using the terminology of the "ghetto" to describe urban Aboriginal peoples (Stackhouse 2001; Polèse 2002; Hayden, 2004). Recent federal government reports also raised concern about the concentration of urban Aboriginal populations (Sgro, 2002).

At the same time, research using indices of dissimilarity to describe urban Aboriginal settlement patterns uniformly concluded that segregation is low to moderate. In general terms the dissimilarity index indicates the proportion of the minority population that would have to move to replicate the distribution of the majority population to which it is being compared. Values up to 0.3 are considered low, 0.4-0.5 are moderate and 0.6 and over is considered high. Researchers using 1981, 1991 and 1996 single origin ethnicity and 1996 identity census data for Census Metropolitan Areas (CMA's) found moderate dissimilarity indices for Aboriginal people, ranging from about .2 to about .4 (Bourne et al. 1986; Clatworthy 1994, 256;

Maxim et al. 2000; Darden and Kamel 2002;). Maxim et al. (2000, 15) argued that Aboriginal groups "are more evenly distributed across CMAs …than most other ethnic groups." Studies employing the 2001 Aboriginal identity data have come to similar conclusions (Peters 2005; Walks and Bourne 2005). However, not all cities are the same with regard to the residential settlement pattern of Aboriginal people. Maxim et al. (2000) suggest that some clumping does exist in the residential patterns of Aboriginal people in urban areas, but there is a large variability in patterns between the cities. They found higher levels of residential concentration of Aboriginal residents in prairie cities than in other regions. Peters (2005) showed that there were variations in the distribution of Aboriginal people, even between large prairie cities.

Very few studies have explored what elements are associated with Aboriginal settlement patterns in cities. The Royal Commission on Aboriginal Peoples (1996) indicated that discrimination by private landlords and poverty limited Aboriginal people's choices concerning housing in urban areas. Carter's (2004, 7) recent review noted that "Aboriginal people migrate to urban areas in search of jobs and better housing, but they often end up living in poor quality, unaffordable housing in declining inner city neighbourhoods." This suggests that the location of Aboriginal people in cities may be associated with the location of inexpensive housing. Key informants interviewed in Winnipeg and Edmonton in 2002 suggested that the main factors affecting Aboriginal residential choice were the location of low cost housing and the location of other Aboriginal people (Peters and Starchenko 2006). The distribution of housing, and particularly inexpensive housing, may be linked to Aboriginal residential patterns in cities.

Data and Methods

We focus our analysis on prairie cities because the Aboriginal population represents a relatively large proportion of the population in these cities. Because there are more Aboriginal people in prairie cities, they likely represent a greater range of housing characteristics than in cities where they are smaller in number of proportion. As noted by Maxim et al. (2003), the census tract is the appropriate data level for this type of question because enumeration areas have too many zero observations for the Aboriginal population in CMAs. The entire CMA is not included in this analysis, only the census tracts within defined city boundaries. This is because some of the cities have reserves within CMA boundaries (but

outside of city boundaries). Reserve residents are almost all First Nations people, and many reserves have large amounts of poor quality housing (Indian and Northern Affairs 2005). Including reserves could make the relationship between quality and proportion of the population that is Aboriginal seem more significant than it is in the rest of the city.

Aboriginal identity data will be used for this study. These data refer to individuals' own perceptions of their Aboriginal identity, in contrast to the ethnic origin data which refers to ethnic or cultural origins of individuals' ancestors. Many Canadians have Aboriginal ancestry but do not consider themselves to be Aboriginal. Individuals with Aboriginal ancestry who do not identify as Aboriginal may not have similar experiences in the housing market as individuals who identify. The Aboriginal identity data was therefore considered to be more appropriate than the Aboriginal ancestry data.

We use four measures of housing characteristics in this study. The average value of dwelling units is a measure of the socio-economic status of housing in the neighbourhood. The rate of home ownership differentiates between neighbourhoods with high numbers of rental units and neighbourhoods where most of the housing is owner occupied. We use this measure rather than the proportion of units in a neighbourhood that are apartments because Aboriginal households tend to be larger than non-Aboriginal households and as a result, they may prefer to rent single family dwelling units rather than apartments (Spector 1996). The proportion of dwellings requiring major repairs measures the quality of the housing stock, while the proportion of dwellings constructed before 1946 refers to both quality and size of housing units. Clearly, using averages can conceal diversity within census tracts (Bourne 1981). However, this is a preliminary study, and averages are useful for an initial exploration. Because we are employing averages and proportions, it is important to avoid the ecological fallacy in interpreting the data. These data indicate whether Aboriginal people are located in census tracts with particular housing characteristics. We cannot conclude from the data whether or not Aboriginal people themselves are living in particular types of housing.

Measures of strength and direction of the relationships between the proportion of Aboriginal identity residents and the housing characteristics of census tracts were obtained using Spearman rank order correlation (Ebdon 1985). Results of Kolmogorov-Smirnov tests confirmed that many of the variables did not have the normal distribution required to perform a Pearson product correlation. After an examination of the scatterplots, a two-tailed test was chosen because this paper does not make predictions about the direction of each correlation. A significance level of 0.01 was used to estimate how likely it is that the observed correlation represents a

real correlation in the population. The Spearman rank order correlation is non-parametric and it does not have the statistical strength of a parametric test largely because outliers are repressed. For instance, in Calgary the highest proportion the Aboriginal identity population comprised of any census tract was 14.2 percent, while in Winnipeg it was 52.7 percent. Both of these census tracts rank as number one for this variable in the respective city. Nevertheless the test does help us explore the relationships between housing characteristics and Aboriginal residential patterns in each city.

Results

Table 2 uses averages and standard deviations to demonstrate the differences in the proportion of census tract populations that are Aboriginal in different cities. The average proportion of census tract populations that is Aboriginal is close to ten percent for Regina, Saskatoon and Winnipeg, with a low of 9.68 percent in Winnipeg and a high of 10.28 percent in Saskatoon. Standard deviations for these cities are also similar to each other, ranging from 8.73 in Regina to 9.6 in Winnipeg. Census tracts with a high proportion of their population that is Aboriginal range from 38.22 percent in Saskatoon to 52.70 percent in Winnipeg. Edmonton and Calgary provide quite a different picture. While Edmonton had the second largest

Table 2: *Proportion of population that is Aboriginal by census tract, Prairie CMAs, 2001.*

	Mean	Standard Deviation	Maximum	Minimum
Winnipeg (n=153)	9.68	9.60	52.70	1.14
Regina (n=43)	9.78	8.73	39.47	0.37
Saskatoon (n=42)	10.78	9.52	38.22	1.73
Calgary (n=181)	2.28	1.97	14.17	0.21
Edmonton (n=154)	4.77	3.91	41.56	0.73
Source: Statistics Canada, Census Tract Profiles, 2001				

urban Aboriginal population among CMAs (41, 295 people, with Winnipeg having the largest Aboriginal population at 55,970 people), Aboriginal people on average make up a smaller proportion of census tract populations (mean of 4.77 and standard deviation of 3.91).The mean percent that Aboriginal people comprise of Calgary census tracts is even lower, at 2.28 percent, with a standard deviation of 1.97. Edmonton had one census tract where Aboriginal people comprised more than 40 percent of the population, but that tract had only 50 people living there in 2001. The Edmonton census tract with the next highest proportion of its population that was Aboriginal was 21.56 percent Aboriginal. Calgary had even lower values, with the tract with the highest proportion that was Aboriginal at 14.17 percent.

Table 3 provides another perspective on these settlement patterns and confirms the fact that the characteristics of Aboriginal settlement patterns vary considerably between cities. The table describes the number of census tracts that fall into different levels of concentration of Aboriginal populations, for example, how many census tracts in each city have between 0 and 9.9 percent of their populations that are Aboriginal, and at the other end of the scale, how many census tracts have 50 percent of more of their populations that are Aboriginal. Winnipeg is the only city with census tracts where the proportion of the census tract that is Aboriginal is 50 percent or higher. Saskatoon and Regina have four and two census tracts respectively where Aboriginal people make up about one third of the tract. All census tracts in Calgary have less than one fifth of their

Table 3: *Percent of total census tracts by percent of census tract population Aboriginal, Prairie Cities, 2001.*

	Percent of Census Tract Population Aboriginal					
	0-9.9	10-19.9	20-29.9	30-39.9	40.49.9	50+
Winnipeg # of tracts	111	24	9	8	1	1
(n=154) % of tracts	72.1	15.6	5.8	5.7	0.6	0.6
Regina # of tracts	32	11	2	2	0	0
(n=43) % of tracts	68.1	23.4	4.3	4.3	0	0
Saskatoon # of tracts	28	8	3	4	0	0
(n=42) % of tracts	65.1	18.6	7.0	9.3	0	0
Calgary # of tracts	179	2	0	0	0	0
(n=181) % of tracts	99.0	1.1	0	0	0	0
Edmonton # of tracts	141	18	1	0	1	0
(n=161) % of tracts	87.6	11.2	0.6	0	0.6	0
Source: Statistics Canada, Census Tract Profiles, 2001						

population that is Aboriginal. Apart from the one census tract in Edmonton where Aboriginal people make up more than 40 percent of the population most census tracts have less than one fifth of their population that is Aboriginal.

Table 4 uses averages and standard deviations to demonstrate the dispersion of the values and consequently the variability among the housing characteristics of census tracts within each city. While there are similarities, there are also key differences. Calgary stands out with the highest average dwelling values, the lowest average and standard deviation of dwellings requiring repairs, the lowest average number of units constructed before 1946, and the highest average percentages of dwellings owned per census tract. Winnipeg falls at the opposite end of the scale with lowest average value of dwelling, a high average proportion of dwellings requiring major repairs, the largest average percentage of dwellings constructed before 1946 (over one fifth) and the lowest average percentage of dwelling owned. Regina and Saskatoon are closer to Winnipeg values, but with a lower proportion of units requiring major repairs and quite a bit lower proportion of houses built before 1946. Edmonton values are close to Calgary's in terms of pre-1946 construction, and average housing values are higher than those of the other cities, but they fall close to Regina and Saskatoon on the other variables. Overall, there are considerable variations in housing characteristics by census tract in these cities, with Calgary showing the highest socio-economic status with respect to housing and Winnipeg showing the lowest.

Table 5 summarizes the result of Spearman rank order correlations between the proportion of the census tract population that is Aboriginal population and the proportion of housing units in a census tract with particular housing characteristics. The first column pools the data for all of the cities to provide a reference point. The other columns show results for individual cities. The pooled data shows that settlement patterns of Aboriginal people were significantly related to census tract housing characteristics. The strongest relationship was a negative one between the percent of the neighbourhood or census tract population that was Aboriginal and the average value of housing. In other words, the larger the proportion of the neighbourhood population that was Aboriginal, the lower the average housing values. The next most significant relationship was between proportion Aboriginal and proportion of dwelling units requiring major repairs. These were followed by a significant positive relationship between proportion Aboriginal and proportion older housing, and a negative relationship between proportion Aboriginal and proportion of units that were owned.

Table 4: *Housing characteristics by census tract, Prairie CMAs, 2001.*

	Regina (n=43)		Saskatoon (n=42)		Winnipeg (n=153)		Calgary (n=181)		Edmonton (n=154)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Average value of dwelling ($)	96414.93	28408.40	123731.95	27722.42	93746.98	33347.73	194222.49	55076.05	135432.11	41990.66
Dwellings requiring major repairs (%)	8.42	5.82	6.16	4.38	9.98	5.91	5.41	3.81	7.63	4.83
Pre-1946 construction (%)	10.90	17.24	11.38	17.87	21.89	24.55	4.08	9.63	4.74	8.44
Dwellings owned (%)	66.78	19.45	62.99	17.79	66.97	24.70	73.22	21.31	62.92	22.76

Table 5: *Correlations between proportion of census tract that is Aboriginal and selected housing characteristics of census tract.*

	Pooled Data (n=573	Regina (n=43	Saskatoon (n=42)	Winnipeg (n=153)	Calgary (n=181)	Edmonton (n=154)
Average value of dwelling unit ($)	-.793*	-.892*	-.816*	-.780*	-.654*	-.660*
Dwellings requiring major repairs (%)	.552*	.684*	.670*	.478*	.532*	.480*
Pre-1946 Construction (%)	.482*	.507*	.620*	.479*	.271*	.404*
Dwellings Owned (%)	-.451*	-.336	-.418*	-.599*	-.541*	-.501*
* Correlation is significant at the 0.01 level (2-tailed)						

Examining cities individually, however, shows that while the direction of most of the relationships is similar to the pooled data, there were also some differences in the significance of these relationships. For each city, the strongest relationship was a negative one between the proportion of the census tract that was Aboriginal and the average dwelling unit value in the census tract. The relationship was strongest in Regina and Saskatoon. Winnipeg's mean average dwelling unit value was the lowest of all the cities, and this may mean that there are other low income people living in areas with inexpensive housing, diluting the association between lower housing costs and Aboriginal concentration. In the case of Calgary, the relatively higher average housing unit value suggests that there are fewer pockets of less expensive housing, with the result that the low income Aboriginal population is relatively dispersed. Other research found that Edmonton has had a longstanding policy of mixing housing types and costs in neighbourhoods, and that may have diluted the relationship for this city (Peters and Starchenko, 2006). These are all patterns that deserve further research.

The factors identified to explain the patterns of relationship for Aboriginal settlement patterns and housing characteristics also seem relevant to other statistics. The association between units needing major repairs and proportion of the census tract that is Aboriginal was strongest in Regina and Saskatoon and weakest in Winnipeg and Edmonton, with Calgary falling in between. The relatively large proportion of units needing repairs in Winnipeg may mean that groups other than Aboriginal people are living in them. The association between older housing and Aboriginal

concentration was again strongest in Regina and Saskatoon. The association was lowest for Calgary which has very little older housing. In Regina, there was no significant relationship between the proportion of dwellings owned and the proportion of the census tract population that was Aboriginal. For the other cities, this relationship was negative, with the lowest value in Saskatoon and the highest value in Winnipeg.

Conclusion

This study suggests that the housing traits of value, age, tenure and level of repairs are related to the settlement patterns of the Aboriginal population. It builds on the findings of Bauder and Sharpe (2002) that residential patterns are related to local housing characteristics. However, these relationships are complex. Most of the values of the Spearman Rank Order correlations for Winnipeg, for example, are not as strong as those for Regina and Saskatoon, even though Winnipeg has the only census tract where Aboriginal people make up more than half of the population. While it seems logical that this is because the large amount of low cost, low quality housing in that city means that other groups than Aboriginal populations live there, this requires further research. Similarly, it would be interesting to explore whether Edmonton's historic policy of combining different types and values of housing in neighbourhoods helps to explain Edmonton's relatively low correlation values. However, these topics are beyond the scope of this paper, which had as its main focus the question of whether Aboriginal settlement patterns were related to the patterns of housing characteristics.

There are other topics that also need further research to flesh out these patterns. The characteristics of urban Aboriginal populations also vary in different cities, with Aboriginal people in Winnipeg, Regina and Saskatoon characterized by higher levels of poverty than those in Edmonton and Calgary (Peters 2005). It may be that the housing characteristics of a particular city affect whether Aboriginal people can reside there; for example low-income Aboriginal people may not be able to afford to live in Calgary, and therefore their settlement patterns are not associated with the housing characteristics that differentiate between house value, state of repair, year of construction and home ownership. These topics, however, are beyond the scope of this paper.

As the literature review suggested, other researchers have associated Aboriginal settlement patterns in cities with discrimination, low incomes and a desire to be near other Aboriginal people. While this paper does not

discount these factors, it suggests that residential settlement patterns may vary by city, and that the characteristics and distribution of different types of housing may also have an effect of Aboriginal settlement patterns.

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Where to live? The residential preferences of Canada's creative class

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Introduction

It has been stated that members of the Creative Class are attracted to the bright lights of the big city, they enjoy the economic and lifestyle opportunities afforded by larger metropolitan centres and they increase economies through their creativity and innovation. Their presence is a driver of economic development (Florida 2002a). However, research on residential preferences and counter-urbanization has indicated that people would rather live in smaller centres or in rural areas within close proximity of larger urban centres (Bollman & Biggs, 1992; Brown *et al*. 1997; Fuguitt & Zuiches 1975). Both the literature on the Creative Class and on the attraction of rural areas suggests that amenity and lifestyle choices are the driving force behind residential preferences. Therefore, many rural areas, particularly those with a rich abundance of natural amenity should be well placed to attract members of the Creative Class. The retention and attraction of young people is a problem for rural and small town Canada and therefore, the residential preferences of the young, educated Creative Class will have a significant impact on the survival of communities in rural Canada.

In an attempt to clarify this dichotomy of viewpoints between urban and rural attractiveness, this research examines and links what have otherwise been two separate streams of research: the literature on the Creative Class and the literature on residential preferences, rural-urban migration, counter-urbanization and the attraction of amenity. Through this examination, a model is created for assessing the residential preferences of Canada's Creative Class. Future use of this model will clarify the relative attractiveness of rural areas and urban areas to the Creative Class and reveal the factors behind their residential decision-making process. The potential results from the use of this model should help decide whether

rural and small town Canada can compete in the attraction of the Creative Class and whether Richard Florida's creative (human) capital theory can be used as a model for economic development.

Who are the Creative Class?

For those who have not heard of the Creative Class, it is the brainchild of Richard Florida at Carnegie Mellon University. Florida (2002a) states that in the new economy desired human capital includes scientists, engineers, doctors, and hi-tech business people among many other highly educated and creative occupations, such as artists, musicians, and entertainers. According to Florida (2002a) people who take advantage of their knowledge and creativity are at a premium. The Creative Class drive the economy with their use of knowledge and their creativity. Their ideas create wealth. It is estimated that the Creative Class makes up thirty percent of the United States workforce, doubling in numbers since 1980. Creativity is a highly prized commodity that "is now the decisive source of competitive advantage" for local economies (Florida 2002a, 6).

However, the idea of a creative economy is not new. The importance of culture and the arts to rural and small town economic growth has been recognized, particularly in the United States, for over 30 years. Organizations such as the New England Foundation for the Arts founded the Creative Economy Initiative which partners New England businesses, government and cultural and educational leaders in an attempt to stimulate the creative economy (NEFA 2006). The importance of the arts has also been recognized in urban regions. The economic value of the arts is supported by research on cultural economics (Towse 2003) and creative industries (Hartley 2005). Florida's works re-focus the creative economy on the attraction of creative human capital rather than the attraction of creative industries. According to Florida (2002a), not only are artists and artisans important to a growing creative economy but so too are creative professionals. This combination of creative professionals and artists has come under criticism. In a study of creative communities in the Northeastern United States, Florida's melding of artists and creative professionals is merely a representation of highly educated members of the workforce and, rather, those people who recognize that their job requires a high degree of creativity but do not necessarily equate with the occupations represented by the Creative Class (Gabe 2006).

Still, Florida's (2002a) interpretation of human capital theory adds two new dimensions to the idea of a creative economy: first, the idea that

creativity and innovation are the most important factors in economic growth and second that the geography of place is becoming more important. Florida states that creative people "don't just cluster where jobs are", but cluster in places that are "centres of creativity" (Florida 2002a, 7). These places provide an environment in which to work and play. There is a movement away from so called standard industrial location sites to axes of creativity. If cities can generate a 'creative climate' they will be able to attract the Creative Class and in turn attract industry (Florida 2002a). At the same time, members of the Creative Class are post-modern consumers of place, and want a "life packed full of intense, high-quality multidimensional experiences" (Florida 2002a, 166). For the Creative Class the importance of experiences is replacing the importance of goods and services. These experiences stimulate and enhance the creative process. Knowledge workers are becoming very sophisticated consumers of place (Kotkin 2000), and because of this, quality of life issues are becoming more important than market factors when selecting a place to live.

So far research on the Creative Class has focused on large cities (see Gertler *et al.* (2002) for work on Ontario). Florida's research has centred on the major metropolitan cities of the United States (Florida 2000, 2002a, 2002b, 2003). These cities are seen as providing a variety of economic opportunities, a stimulating environment and amenities for every possible lifestyle. Metropolitan centres are seen as evolving into entertainment machines in order to attract creative human talent (Clark *et al.* 2002).

There have been criticisms of Florida's methodology and that there is nothing new about Florida's work; that it merely supports traditional pro-urban sentiments (Milligan 2003). A city or town serves as a container for a collection of site-based experiences that, when brought together, adds to an individual's perception of the place in which they live. It is what the individual wants in a place that makes them choose a location to live (Milligan 2003). Also, choices made by the Creative Class are seen to widen the geographic split between rural and urban regions. Areas are pulling away from each other economically and politically (Donald and Morrow 2003). When competing for talent, cities are using Florida's blueprint for growth – attract the Creative Class and you will create economic growth – as an economic cure all. However, other non-economic issues need to be considered. Attracting creativity may only be a band aid solution for much deeper social problems such as social barriers to participation by all community members and economic barriers that exclude participation (Donald and Morrow 2003). It must be remembered that the "creative economy is not a one-size-fits-all panacea. In fact, creative economies…vary from city to city, town to town" (Dobelle 2005, 8) and experience difference levels of success and failure. Despite much criticism

the Creative Class is still perceived as a significant road to economic development for communities of all sizes.

The Creative Bandwagon

Recent interest in the creative economy has been prolific. Richard Florida's *The Rise of the Creative Class* (2002a) has seen a re-focusing on the creative economy and led to a 'creative bandwagon' effect. It is now thought that if communities, especially rural, can compete in the creative economy then they might not be reduced to Florida's (2002a) grim downward economic spiral. The attraction of the creative economy has many researchers and policy makers reviewing and changing policy concerning economic development strategies. Governments at all levels are investigating and implementing policies that promote their creative economy and attract the Creative Class. These initiatives cover the whole rural-urban continuum. This section, briefly, reviews some of the initiatives set in place at varying levels of governance

At the national level, the importance of creativity to national economies has been recognized. Australia has a *Culture and Recreation Portal* on its government website that recognizes that there is a need to provide strategic business management and advice to the creative sector in Australia (Australian Government 2006). The British Council identifies the increasing importance of the creative sector. The creative economy is the only sector that every region in the United Kingdom has identified as a priority area for economic growth (British Council 2006). In 2005, the United States National Governors Association (NGA) commissioned a report, *Strengthening Rural Economies through the Arts.* This report identified that an "arts-based economy can enhance state efforts to diversify rural economies, generate revenue, improve the quality of life, and attract visitors and investment" (NGA 2005, 1).

At a regional scale, the NGA (2005) report on strengthening rural economies recognizes the importance of creativity to over 25 states. The creative economy truly is alive and well across the United States. While these initiatives have concentrated on mainly arts-based development, many localised economies have focused on creating the required creative climate needed to attract the Creative Class. Two such economies are represented by the major metropolitan centres of Memphis and the Silicon Valley. These two urban areas have seen interested parties present creative strategic plans for the development of their cities (Memphismanifesto 2006; CI-SV 2006). In Canada, the City of Calgary, Alberta, had Richard

Florida give the keynote address at its 2003 annual city forum and in the same year Kamloops, BC hosted a forum on creativity and culture. The keynote speaker for the Kamloops forum was a Florida disciple from Seattle, and in 2004 the City of Kamloops hired an arts and cultural development supervisor (Creativecity 2004). A brief look at Richard Florida's website identifies new organizations, institutions, and cities that are climbing aboard the creative bandwagon (creativeclass.org 2006).

The creative bandwagon, despite Florida's thoughts, may not have left rural areas behind. Artistic enclaves exist throughout Canada (Bunting and Mitchell 2001). Chemainus, British Columbia is a community that has utilized its arts community and arts festivals to evolve from a forestry dependent community to a thriving arts-based community (Barnes and Hayter 1992). Perhaps the best example of a rural area's attempt to attract Florida's Creative Class in Canada is that of Pinawa, Manitoba. Pinawa is a community of 1,500 people and is located about an hour or so east of Winnipeg on the border of Whiteshell National Park. Pinawa is located on Winnipeg River and has incredible natural amenity value. In 1963 the Atomic Energy of Canada Limited established a research station in Pinawa, which was recently decommissioned. Many scientists and researchers still reside in Pinawa, and with its natural amenity and proximity to the major metropolitan centre of Winnipeg, it should be well placed to attract the Creative Class. The Pinawa website clearly advertises to the needs of the Creative Class:

> Today, Pinawa is an attractive and diverse community, home to scientists, entrepreneurs and their families, all enjoying the advantages of Pinawa's unique high-tech lifestyle. Newcomers to Pinawa work effectively with broadband internet access, technology and business resources all conveniently located in a recreation paradise. (Pinawa 2006)

Pinawa's success in retaining and/or attracting young educated people is evident in the fact that in 2001 the percentage of the population aged 20-34 with a university certificate, diploma or degree was 27.3% as compared to the provincial average of 18.7% (Statistics Canada 2001).

The creative economy is viewed as a panacea for economic development across North America. The creative economy is an attractive proposition. Creativity has positive connotations, such as freedom, innovation and surprise. The concept of the creative economy conjures up "images of life and work beyond boredom, repetition and poverty" (Gibson & Klocker 2005, 95). Thus, the creative economy has been accepted as an important economic development strategy. However, if Richard Florida

is right, in order for communities to be successful in the creative economy, creative people – the Creative Class– are needed. Yet, no one apart from Richard Florida has asked the Creative Class where they would like to live. Therefore, it is important to determine the factors that drive the Creative Class' residential preferences and to determine the type of community in which they want to live.

Creative Class: Urban vs. Rural

Simply put, urban areas have an aggregation and agglomeration of economic and lifestyle opportunities that make them the major players in the market for the members of the Creative Class. They provide the jobs and wages at the same time as providing the entertainment and experiences desired, while rural areas, particularly those which have been reliant on resource based activities, will find it hard to pull out of what Florida calls a grim-downward spiral. And yet despite this comment, there might be light at the end of the tunnel for rural communities.

The Creative Class are attracted by natural amenity, outdoor recreational opportunities and a higher quality of life (Florida 2002a; 2002b). In the new economy amenities sought by the Creative Class typically revolve around outdoor recreation activities and lifestyle choices. Members of the Creative Class are active, not passive, and they want to experience the city and the great outdoors. Outdoor recreation is seen as a release and another activity to be experienced. It can be argued that the best place to experience natural amenity and outdoor recreation is outside of the city in rural areas. Furthermore, rural areas have consistently been associated with a high quality of life, and this is often times linked to anti-urban or pro-rural sentiments, or both.

Why Not Rural?

So then, why are rural areas not preferred as a destination for the Creative Class? The Creative Class are potentially very important to rural areas. Human capital issues in rural areas are very complex (Statistics Canada 2004) and include issues such as education, economic activities, migration and broad social concerns (Davis 2003; Swanson & Luloff 1990; Summers *et al.* 1995; Teixeira 1995; Galston & Baehler 1995).Creative Class Rural human capital issues have focused on mainly economic concerns, in particular, the supply and demand for human capital, with human capital

seen as a necessity in the means of production. What is important about the 'creative capital theory' is that there is an emphasis on the importance of amenity in the attraction of human capital. Indeed, amenity could be the light at the end of the tunnel for many rural areas because they have the ability to provide the natural and lifestyle amenities that the Creative Class seek.

The Attractiveness of Rural Areas

Literature over the last 30 years has examined the attractiveness of rural areas. There has been an evolution in the research literature leading from residential preferences to urban-rural migration, from counter-urbanization to amenity driven migration. These areas are not mutually exclusive, rather they are intimately linked and in many ways they are used synonymously. What follows is a brief look at first the residential preference literature, second urban-rural migration literature, third counter-urbanization literature and finally literature on the attraction of amenity as it relates to the potential attractiveness of rural areas to the Creative Class.

Residential Preferences:

First it must be stated that early work on residential preferences refers to where someone would like to live *not* the actual location of their residence. Both popular opinion polls and early academic work on residential preferences of the general population showed that people do not want to live in major urban centres (Lewis 1972; Fuguitt & Zuiches 1975). People would prefer to live in less dense and smaller communities. As Lewis stated in 1972, it seems that the glamorous city has lost much of its glamour. Crime and congestion are pushing people from the city.

In 1975, Fuguitt and Zuiches identified that although 20 percent of the population live in cities over 500,000 only 9 percent state that they want to live there. Smaller centres are seen as having better social and environmental qualities. In Canada research into residential preferences mirrors that of the research completed in the United States. The level of dissatisfaction with current residences among urban core residents is not apparent in Canada's population. Forty one percent of urban core residents desired to stay in their current location; the remaining fifty nine percent prefer to move down the urban-rural hierarchy to less urbanized areas (Bollman and Biggs 1992). Bollman and Biggs (1992) also add that more

than 85 percent of Canadians living in remote rural regions want to stay in rural Canada.

There are many reasons for the desire to live in less urban areas. Early work on residential preferences identified anti-urban sentiments (Blackwood & Carpenter 1978) as the reason for the preference of people to live down the urban-rural hierarchy, though this is not necessarily the only factor at work. More recent research has shown that other factors are at work. Examples of these attractions are shown in the research by Eser and Luloff (2003) and Walker and Fortmann (2003), who examine the attraction of rurality in areas of Pennsylvania and California respectively, and Power and Barrett (2001) and McGranahan (1999) who indicate that counties with an abundance of natural amenity are attracting migrants in the United States at the national level. Research on residential preferences is now linked more with the movement of people to their desired location rather than just a preference for a desired location

Urban to Rural Migration:

Movement of people to rural areas was first noticed in the 1970s. Since about 1910 the movement of people in North America was toward urban areas. However in the early 1970s research identified that rural growth was outpacing urban growth (Brown *et al.* 1997; Fuguitt & Beale 1996; Fulton *et al.* 1997; Johnson & Fuguitt 2000). The major factor in this growth was in-migration (Johnson 1993). Rothwell *et al.* (2002) identify that the greatest proportion of migrants were educated and in the 25-34 age cohort. This rural growth has been dubbed the rural turnaround. However, Joseph, Keddie and Smit (1988) argued that in Canada rural growth was due more too urban spillover than any other factor, and that much rural growth can be attributed to the re-drawing of census boundaries. Whether this is the case or not, it is generally accepted that people were moving to rural areas both near and far from major urban centres.

In the 1980s the trend reverted back to one of urbanization – but in the 1990s there was evidence again of rural growth (Fulton *et al.* 1997; Johnson & Beale 1995). Although in-migration was important the major factors contributing to this growth, so were natural increase and population retention (Johnson 1993). These trends were not just a United States phenomenon. In the period between 1966 to 1996 rural and small town Canada experienced decline in the 1960s but saw a turnaround between 1971 and 1981. The loss of people from rural Canada returned again in the 1980s but again saw another turnaround in the early 1990s (see Table 1).

Proponents of residential preferences argue that these periods of growth were due to a mixture of anti-urban and pro-rural sentiments. There is however evidence that these migratory streams follow macro-economic

Table 1: *Migration between Larger Urban Centres (LUC) and Rural and Small Town (RST)areas for individuals aged 15 and over, 1966 to 1996.*

	1966-1971	1971-1976	1976-1981	1981-1986	1986-1991	1991-1996
Non-movers RST	4,889,295	5,583,510	5,378,435	4,548,210	4,663,105	4,907,775
Migrants						
RST to LUC	711,595	582,700	599,905	563,965	554,505	469,985
LUC to RST	349,170	633,090	647,150	451,475	552,450	545,665
Total Net Migration to RST	-362,425	50,390	47,245	-112,490	-2,055	75,680
RST						
In migration rate	6.2	10.3	10.8	8.8	10.6	10.1
Out migration rate	12.7	9.4	10.0	11.0	10.6	8.7
Net migration rate	-6.5	0.8	0.8	-2.2	0.0	1.4

Note:
RST In migration rate = (LUC to RST) / (RST non-movers) + (RST to LUC) * 100
RST Out migration rate = (RST to LUC) / (RST non-movers) + (RST to LUC) * 100

trends. Rural areas were booming in the 1970s, there was a recession in the 1980s and the recovery from this recession again allowed people to potentially relocate to rural areas. It is fair to say that people are more able to act on their residential preferences during economic upturns (Brown *et al.* 1997).

Counter-urbanization:

The movement to rural areas or the movement of people down the urban-rural hierarchy is called counter-urbanization (Dahms & McComb 1999). Literature on counter-urbanization seems to have replaced literature on residential preferences. While traditional literature on residential preferences examined the desire to move, counter-urbanization examines residential preferences as people move down the urban-rural hierarchy. Counter-urbanization literature generally examines why people move to less urban areas rather than the number of people moving or the potential desire to move. Like most concepts counter-urbanization is complex and has been used by many in a cavalier fashion. Mitchell (2004) tried to bring some clarity to the concept in her article, "Making Sense of Counter-urbanization". In this she identifies three types of counter-urbanite: 1) the exurbanite – who seeks the bucolic countryside but retains economic ties to the city – primarily through the process of commuting to work; 2) the displaced-urbanite – who moves for economic considerations regardless of city size – and reacts to employment, lower costs-of-living and/or

available housing; and 3) the anti-urbanite, people move beyond the rural-urban fringe to escape crime, high taxes, congestion and pollution. The push and pull factors of urban and rural variables lead to a joining of anti-urban and pro rural sentiments (Mitchell 2004). It can be argued that within these three types there are further complexities, but the important factor here is the spatial dimension. Though our discussion so far in this paper has been set in the context of an urban-rural dichotomy it must be remembered that rural and urban are not distinct entities but there is a continuum of spaces and places between major metropolitan areas and isolated rural areas, and the different types of counter-urbanite will settle somewhere along the continuum depending on their perceptions of rurality, their demand for natural amenity, and their need to be close to an urban centre among many other factors.

Recent Trends:

Recent trends in rural-urban migration streams show that urban growth is outpacing rural growth. However, some non-metropolitan areas are experiencing in-migration and growth. There is a wealth of literature on the Mountain West of the United States, where the pull of natural amenity and high order services in rural communities is a major attraction to migrants who wish to live in an area where they can both work and recreate (Beyers & Nelson 2000; Booth 1999; Power 1996; Power & Barrett 2001; Smutny 2002). Drabenstott and Smith (1995) have identified remote counties in the Ozarks region of Missouri that are experiencing rapid growth due to scenic beauty.

In Canada work by Bunting and Mitchell (2001) and by Mitchell *et al.* (2004) has identified that artists are attracted to rural locales because of the natural beauty which is also often a 'tool' for the artist to use in their work. Dahms and McComb (1999) documented the growth of rural areas in Southern Ontario due to in-migration and Lovett and Nelson (2003) identified that the chance for a higher income is not the pull factor it once was; people are moving to areas of high amenity value in British Columbia for lifestyle reasons. With the increasing efficiency of technology related to the transportation and communication of goods, services and ideas, Johnson and Fuguitt (2000) argue the friction of distance is weakening and allowing people to locate where they want to and more freely.

Why are People Moving to Rural Areas?

In summarizing why people are moving, and why the Creative Class may move to rural areas, the literature indicates the following major reasons: natural amenity, sentiments, attachment to place, and economic opportunities. Natural amenity is clearly a lure for the Creative Class, including artists, as shown in the work cited here by Bunting and Mitchell (2001) and Mitchell *et al.* (2004). At the same time, McGranahan (1999) has shown that in the United States the attraction of natural amenity is a nationwide phenomenon. As already stated, pro-rural and anti-urban sentiments are strong factors in the counter-urbanization process and serve to entice more members of the Creative Class to the countryside. Attachment to place is also important. Galston & Baehler (1995), for example, state that a young person's attachment to place may have a bigger impact on whether they stay or return to that place than economic opportunities, and Davis (2003) in her study of Newfoundland fishing communities found that the filial relationship was important to whether youth returned to their community once educated. Finally, access to economic opportunities is often related to the commuter who wishes to experience rurality but still work in the city, but there are an increasing number of cases where people are moving further from the city while still retaining access to the urban market for business purposes (Kotkin 2000; Mitchell *et al.* 2004; Renkow & Hoover 2000).

Who is Moving to Rural Areas?

If rural areas are attractive, then who is moving to them? The picture is unclear, but research has identified that in the West there are two major types of migrant (Nelson 1999; Salant *et al.* 1997). First, there are retirees, who have the ability to act upon their residential preferences. Second, there are the young and educated. It is widely accepted that the young are more likely to act on residential preferences but usually do so because of economic opportunities. The young and educated, then, can somewhat act on their residential preferences. Regardless of their motivations for movement among both groups, they have been identified as educated and have access to capital (Nelson 1999). Are these seniors or young people members of the Creative Class? Well that is unclear also.

There is some evidence of the Creative Class in rural areas in Canada. In a study on knowledge workers it was shown that there are indeed knowledge workers in rural areas (Beckstead & Vinodrai 2003). The absolute numbers are, not surprisingly, lower than that of their urban counterparts,

but the proportion is similar to the urban proportion and the growth rate is also similar (Beckstead & Vinodrai 2003). If we add artists into the mix – as they are part of the Creative Class– Bunting and Mitchell (2001) identified a number of artist enclaves in rural locales and Mitchell *et al.* (2004) identified that visual artists are acting as counter-urbanites in Ontario. So, the Creative Class do populate rural areas, but will more come?

Some Models

We offer four graphical representations of why the Creative Class may be important to rural areas. In the traditional economic model, rural areas were driven by a local industry that supplied the jobs (Figure 1). Often the community existed due to the existence of the industry. In the amenity led model, amenity attracts people and, as Florida argues, will attract businesses because they are now realizing that if they locate in areas of high amenity they will be able to attract and retain employees. The attraction of the Creative Class in turn also attracts industry; the Creative Class can also be a generator in the economy as the footloose capital they bring into an area is often spent in the community allowing for not only community existence but community growth. This economic model is the model of the Creative Class. Therefore it is important that we know the residential preferences of the Creative Class.

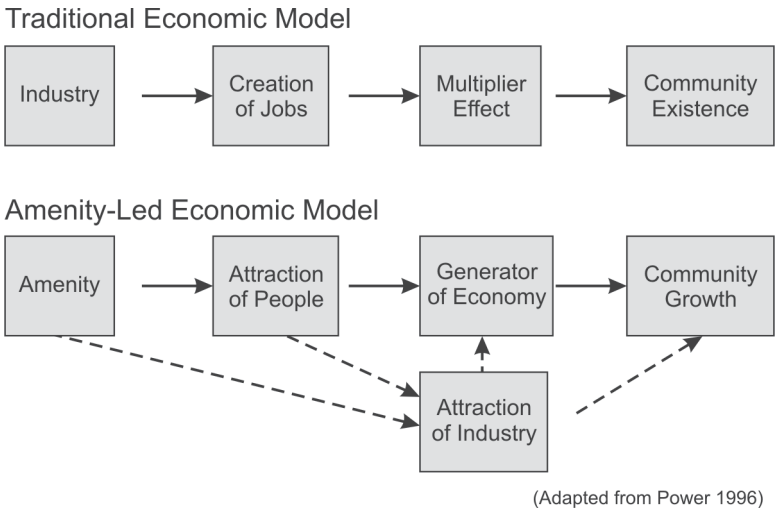

Figure 1: *Traditional and amenity-led economic models.*

The Creative Class are attracted to urban centres. However the literature has demonstrated that amenity, anti-urbanism and/or pro-rural sentiments and attachment to place are factors that attract people to rural areas – *amenity* is specifically identified as something the Creative Class seeks and rural areas provide (Figure 2). However if the Creative Class are attracted to rural areas it has to be recognized that there is a rural to urban continuum (Figure 3). Therefore when choosing a place to live it should be accepted that there are a multitude of options.

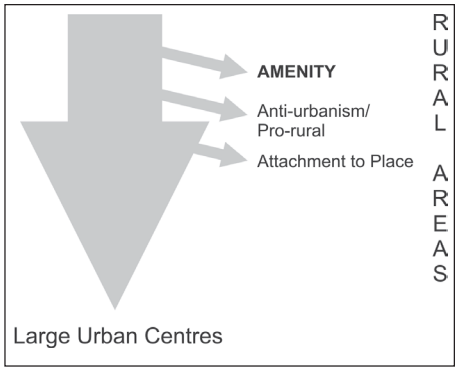

Figure 2.

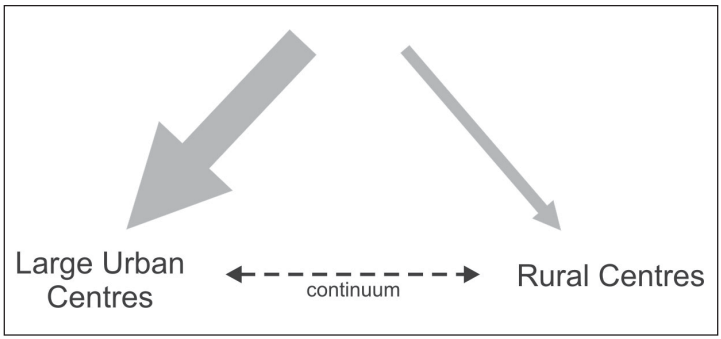

Figure 3.

With the rural to urban continuum in mind, and noting that the literature has identified a wide number of factors that drive residential decision making. This research suggests a model which should be tested in the field to determine the residential preferences of Canada's Creative Class (Figure 4). The model begins with the Creative Class and asks where would these people prefer to live? The model recognizes that various decision making filters come into play. For example, one needs to be aware of: job opportunities and wages; health care and education facilities; family and friends; recreational services; and, of course, natural amenity. The residential outcome could be, depending on various factors, anywhere from a small isolated rural place to a major metropolitan region. This model

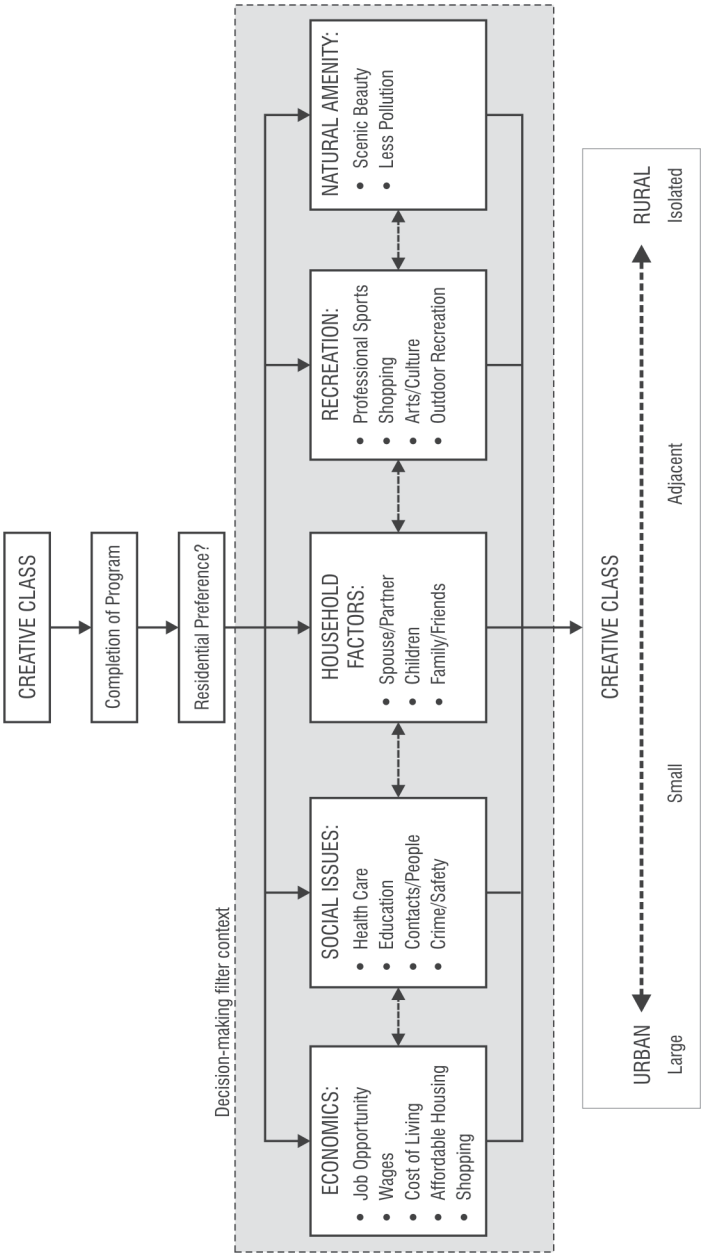
CREATIVE CLASS
Completion of Program
Residential Preference?
Decision-making filter context
ECONOMICS:
• Job Opportunity
• Wages
• Cost of Living
• Affordable Housing
• Shopping
SOCIAL ISSUES:
• Health Care
• Education
• Contacts/People
• Crime/Safety
HOUSEHOLD FACTORS:
• Spouse/Partner
• Children
• Family/Friends
RECREATION:
• Professional Sports
• Shopping
• Arts/Culture
• Outdoor Recreation
NATURAL AMENITY:
• Scenic Beauty
• Less Pollution
CREATIVE CLASS
URBAN
Large
Small
Adjacent
RURAL
Isolated

Figure 4.

can be used to identify the residential preferences of both the existing members of the Creative Class, people who are currently employed in creative professions, and the residential preference of the future Creative Class, for example, people who are currently enrolled in graduate programs that lead to future employment in creative professions.

Conclusion

The Creative Class can play an important role in economic development in rural areas. The supply of human capital has been a major barrier to economic development. If rural areas with high amenity value position themselves in the market for the Creative Class they may (1) attract people who in turn will attract industry or (2) at least attract people to their community who will require services which in turn should allow for some economic development. Should this model be tested, the results will be of great importance to rural and small town policy decision makers. First, policy makers will be able to determine whether their specific region or community can compete for the Creative Class. Second, if it is determined that the Creative Class desire to locate in a region or community the variables deemed favourable by the Creative Class when selecting a place to live can be marketed by the community in order to attract this form of human capital. If the model indicates that the Creative Class do not wish to settle in rural and small town Canada in significant numbers then resources should be directed toward other economic growth strategies. The model will allow rural policy makers to decide whether they can ride Florida's 'creative bandwagon' to potential prosperity.

Acknowledgements

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An evaluation of community-based tourism development: how theory intersects with practice

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Abstract: As Canadian rural communities respond to changes in their resource-based economy, many are increasingly considering tourism development as an option for diversification. Indeed, recent rural employment trends in tourism suggests the evolving importance of tourism in such places. Much research has examined the value of tourism in rural communities (Reid 2003; Jamal & Getz 1999; Reed 1997; Butler 1998), suggesting that community-based tourism development may provide an opportunity for a sustainable tourism industry. Subsequently, community-based tourism has come to be understood as a bottom-up approach to tourism planning and development that incorporates local individuals in the planning process, in a meaningful way. This paper critically examines the intersection of community-based tourism theory with practice, through an examination of an actual rural community-based planning process in Marathon, Ontario, undertaken by the author. What this examination illustrates is that although existing theory does reflect actual practice, there are several aspects of 'reality' that the sanitized literature on community-based tourism planning do not adequately reflect. Importantly, the role of the practitioner or researcher in influencing the process and the power structures at play within a community-based planning method must be fully considered.

Keywords: community-based tourism, community participation, rural, Marathon, ON.

Introduction

Many rural areas are looking for alternative economic development to replace a former reliance on agriculture, mining, or forestry. As traditional industries are challenged by mechanization, resource scarcity and international influences, economic planners are looking for new industries based on these same resources, but which are not facing the same challenges (Butler *et al.* 1998). Often tourism is considered as an option because its development relies on an area's cultural, historic, ethnic,

geographic, and natural uniqueness (Reid 2003). Rural areas provide a special appeal to tourists because of the mystique associated with a rural environment, its distinct culture, history, ethic and geographic characteristics (Butler *et al.* 1998). This is largely due to the fact that in Canada, approximately 70% of the population lives in urban environments, though this average varies within the provinces (Mendelson & Bollman 1998).

It is valuable to examine the trends in Canadian rural tourism to illustrate the importance this industry has for rural Canadian economies. In 2000, 1% of all domestic overnight trips were spent in rural areas (primarily in resorts) and although this is a small percentage, it contributed $360 million to the national economy (Beshiri 2005a). Nearly half of all international tourist visits to Canada were to predominantly rural areas, though approximately half of the visitors remain in rural areas adjacent to urban centres while the remaining percentage visits more remote rural areas. In particular, 4% of all USA visitors travel to northern rural areas. When comparing the number of tourist visits to the number of rural residents, we find that for every rural resident, there are 11 tourist visits compared to 6 tourist visits for every urban resident. In other words, there is greater intensity of tourism in rural areas than urban.

The total employment figures attributed to tourism within Canada was 490,000 jobs in 2003 (Beshiri 2005b). Between 1996 and 2003, employment in the tourism related sectors (air transportation, all other transportation, accommodation, food and beverage, recreation and entertainment, travel agencies) grew by approximately 15%. In rural areas, tourism employment accounts for 3% of all jobs, while in northern areas, it is 4%. In fact, tourism has been the strongest employment sector across Canada for rural regions. The accommodations (40%), food and beverage (27%), and recreation and entertainment (16%) sectors account for the greatest employment.

Despite its relative importance within rural economies, tourism should not be considered a panacea to alleviate the de-development of rural areas. Much research has examined the value of tourism in rural communities (Reid 2003; Jamal & Getz 1999; Reed 1997; Butler 1998), and increasingly, criticisms have been leveled at traditional tourism development and planning, including: the seasonality of the industry and low paying jobs that do not offer sustainable employment (Jamal and Getz 1999; Butler 1998; Reed 1997; Troughton 1995); the entrenchment of power structures and hierarchies within communities through exclusionary practices in planning and non-local development and ownership (Reid 2003; Gunn and Var 2002; Belsky 2000), and; the reactionary framework within which

tourism is often chosen, without a full understanding what tourism is or how it can and should be managed (Draper and McNicol 1997; Joppe 1996). As result, several authors have advocated for a community-based approach to tourism development suggesting that it may provide an opportunity for a sustainable tourism industry (Reid 2003; Murphy 1985; Murphy and Murphy 2004). As a result, community-based tourism has come to be understood as a bottom-up approach to tourism planning and development that incorporates local individuals in the planning process, in a meaningful way.

Although several authors (Murphy 1985; Murphy and Murphy 2004; Gunn and Var 2003) have advocated for the importance of community-based planning, Reid (2003) and Reid, Mair and George (2004) have provided a model and process for undertaking a community-based approach to tourism development. Their model has been applied in several case study areas (British Columbia, Kenya and Bermuda), but has not been implemented or evaluated outside of that research team. Further research is required to critically examine the practical and theoretical elements of this model in light of criticisms of community-based tourism which question the usefulness and suitability of such processes (Joppe 1996; Blackstock 2005). The objectives of this paper are to critically examine the intersection of community-based tourism theory with practice, through an examination of a rural community-based planning process in Marathon, Ontario, based on Reid's (2003) model. As such, the paper begins with an assessment of community-based tourism, followed by an examination of Reid's (2003) community-based tourism model. After a brief description of the case study (Marathon, Ontario), an account of the process is provided, followed by an evaluative discussion on the experience of conducting strategic tourism development planning based on Reid's model.

The methodology employed in this research is qualitative, and is based on my reflections as a facilitator and participant in the process and implementation of Reid's community-based tourism model. By request of the Tourism and Economic Development Officer (EDO) for Marathon, I facilitated the development of a strategic plan for the development of Marathon's tourism attributes, with the Tourism Action Committee (TAC) agreeing to utilize Reid's Community-based Tourism model as the framework for conducting the strategic planning process. I facilitated meetings for the TAC over a 6-month period (January to August 2006), during which time I kept field notes of my observations of the process and its implementation.

Community-based Tourism

The tourism industry broadly is understood to be growing at exponential rates and is continually permeating different locales around the globe. Much literature has discussed its benefits and costs to the areas in which it exists, but as Harrill (2004) points out, there is a relative dearth of literature regarding planning for the industry. As indicated earlier, tourism developments have been criticized on several fronts, and many authors would argue that these criticisms are a result of a lack of planning, and importantly, a lack of involvement of local people in that planning process (Reid 2003; Ryan 2002; Hall 2000; Joppe 1996; Inskeep 1991; Murphy 1985). Given the levels at which the tourism industry pervades a community (employment, land use, environment, social structure and infrastructure) obtaining the perspective of residents should be integral to any tourism planning (Harrill 2004).

Community-based tourism is premised on the inclusion of local people in the development of the industry. In fact, its characteristics include local control of development, community involvement in planning, equitable flow of benefits, and incorporation of resident values (Tosun 2006; Blackstock 2005; Reid 2003; Hall 1996; Pearce 1992; Haywood 1988; Murphy 1985).

Reid (2003) argues that traditional tourism planning is conducted from a social reform and or policy analysis perspective. These theories of planning are primarily top-down in approach, leaning heavily on government intervention, expertise and investment. These perspectives involve experts who analyze the situation in a scientific, rational way and determine an appropriate course of action to be administered at the local level. Although these types of approaches may be appropriate from a corporate point of view and in certain contexts, Reid (2003) argues that social learning and mobilization theories are more appropriate perspectives to apply to community-based tourism development, as they reflect the perspectives of the local community residents who live with the repercussions of tourism development on a daily basis. Social learning is based on utilizing local collective knowledge linked to action (social mobilization) and accounting for the political context in which planning is taking place. The approach is based in commonly held values and the transformative power of utilizing these community values and knowledge in constructing solutions to local problems (Stankey *et al.* 1999).

According to Reid (2003) employing a community-based approach to tourism development, based on a social learning/mobilization framework, can aid the implementation and sustainability of the development as often such projects have greater community support and buy in from an inclusive

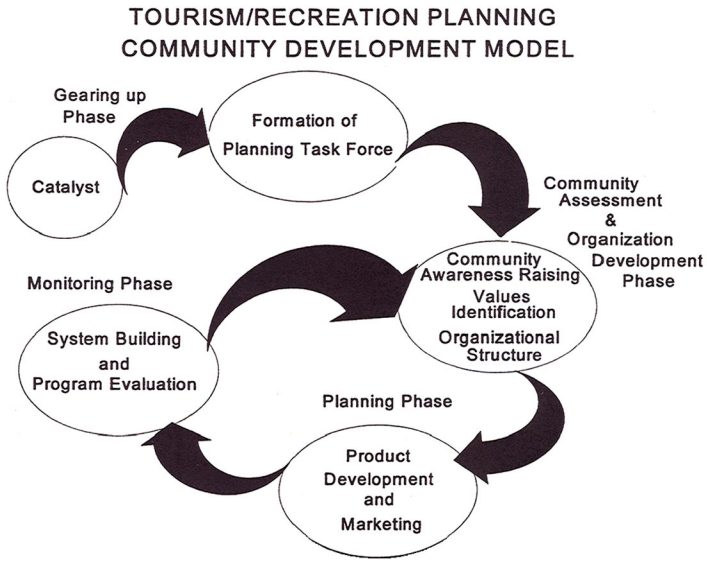

Figure 1: *Reid's (2003) community-based tourism development planning model. (Source: Reid 2003)*

list of stakeholders. Figure 1 provides a graphic representation of Reid's (2003) community-based tourism development planning model. As is evident from the model, the process begins through an individual catalyst that provides initial leadership to the planning process; often times this requires the inclusion of an outside expert to facilitate the community group. A task force (or action committee) is then struck, comprised of individuals who have technical expertise, vested interests in the eventual products of the plan and are concerned about the interests of the community more broadly.

The next phase of the model is important, as it involves raising community awareness about the issues of tourism development and to seek the involvement of the community in determining the essence of the final product. It is this stage that deviates from traditional entrepreneurial approaches to tourism planning as it integrates community residents in visioning and planning for their community's future in relation to tourism developments. This phase requires, "great skill in the subject areas of community development and group facilitation. The implementation of this stage of the process demands time and energy in organizing the community to take charge of the process" (Reid 2003: 133). The skills that are learned by community members during this process should be

transferable to other community development projects (thus contributing to the social learning and transformation process previously discussed).

The planning phase then involves several stages – product development and marketing, system building and program evaluation. The focus of the Marathon case study strategy was on product identification and development, as discussed below.

In order to complete a tourism development plan in keeping with the community-based philosophy and approach outlined above, a series of steps must be undertaken, which include the following:

Step 1: History - Utilize past strategic plans and surveys to determine what is already known about tourism in the community;

Step 2: Objectives - Based on what is learned from past research, determine a vision of what the community might look like in the future in relationship to tourism;

Step 3: Strengths and Weaknesses of Existing Tourism Product - Examine what currently exists with regards to tourism (current/past tourism statistics and potential tourism developments);

Step 4: An Inventory - Undertake an inventory of current tourism and recreation related attributes in the community and immediate region;

Step 5: Action Items - Identify what needs to be done and what the priority areas are. This should include the identification of partnerships and existing community groups and organizations that can potentially be involved. Action items and implementation strategies should be determined, along with a time frame for development.

Step 6: Develop a Planning Document - Create a document that outlines the process, the priority areas, partnerships, actions & implementation strategies and potential time frames. This document should be shared with the community more broadly through a variety of venues and Reid (2003) suggests that public meetings are the least preferred method and advocates for smaller venues and multiple meeting times. The final document should be approved and accepted by local government.

As this discussion illustrates, community-based tourism development has arisen from a desire for a more inclusive approach to tourism planning which are thought to provide greater benefits and control to the local community and ultimately, aid in the transition towards a sustainable future. An examination of Marathon, Ontario as a case study provides an opportunity to examine the application of Reid's (2003) community-based planning model.

The Case Study: Marathon, Ontario

Marathon, Ontario is located between Thunder Bay and Sault Ste. Marie, on the north shores of Lake Superior (Figure 2). The community is located within the dominant boreal forest that covers the Canadian Shield. This forest cover and underlying geology have resulted in a town that is "Built on paper, laced with gold", a motto speaking to the dual economic base of gold mining and the pulp industry, which have sustained the community for the past forty years. However, the soft wood lumber crisis, global competitiveness and the limited life span of the gold mine require that the community investigate a number of economic diversity options, one of which is tourism.

Given its relatively small population of 3,863 (Statistics Canada 2006), Marathon has a remarkable diversity of services and amenities. The community has both a public and Catholic school system, along with a French school. A regional full emergency service hospital, eleven physicians, chiropractic clinic, optician, and a dental office provide a full range of health care. In addition, Marathon has a extensive array of retail, service, entertainment, accommodation and recreational facilities. This range of amenities not only makes Marathon an attractive place of residence but also provides opportunities for tourism, an economic development option not lost on the planners and businesses in the community.

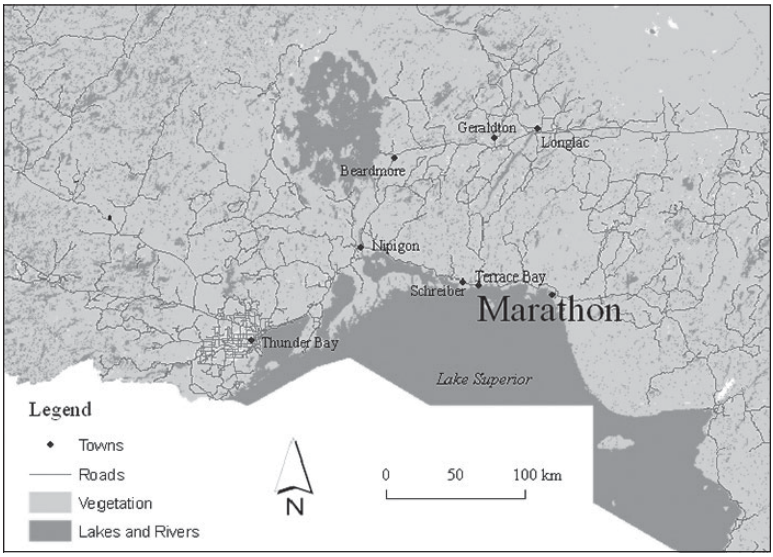

Figure 2: *Location of Marathon, Ontario.*

A Brief Examination of Marathon's Past and Current Tourism Situation:

There have been a variety of important and useful studies completed that concern tourism development in Marathon, including: *Marathon and Area Tourism Strategic Plan: Critical Area Development Plan* (1997); *Marathon and Area Tourism Strategic Plan: Residents Survey Summary Document* (1997); *Marathon Visitor Information Centre Statistical Reports* (1995 to 2005), and; *Marathon Business Retention and Expansion Report* (2005). These studies of Marathon's tourism potential and future clearly identified many of the naturally occurring features (both physical and cultural) as attractions worthy of development. In addition there has been recognition that other community assets and infrastructure needs to be addressed in order to support tourism development.

One of the unique features of the community is the fact that it has a Visitor Information Centre (VIC) that has collected visitation data since 1995. A summary of this data is provided in this section to present a picture of visitation patterns to the community and region. The Marathon visitor information is based on four months (May through August) of data collection. The statistics reflect only those people who are surveyed by VIC staff, which represent approximately 70 per cent of total visitation to the centre. The data for 2004 do not include statistics for the month of June, so this data set is incomplete. Although the types of data collected remain relatively consistent each year, the method of data collection and the people collecting the data do not; the data for 1995 illustrates the problems associated with inconsistent data collection methodologies as these numbers are completely out of sync with all other data years. As such, these data can only be used for illustrative purposes and no conclusions can be made with certainty. Despite such limitations, the data provide a clear indication of visitation patterns and the interests of visitors to Marathon and the region. When these patterns are compared to those available for northern Ontario as a whole, it is evident that Marathon's tourism experience mirrors the trends for this portion of the province (Rogers 2003).

As Figure 3 illustrates, the largest number of visitors to Marathon are from Canada, with approximately 65% being from Ontario. Given the large geographic size of the province, it is expected that there would be a large percentage of domestic visitation. The American market makes up about 25%, with visitors coming from the border states of Wisconsin, Minnesota and Michigan. The number of international travelers is relatively low, but given the relatively peripheral location of Marathon within Canada, this number is higher than anticipated.

The total number of visitors to Marathon has remained relatively steady between 8,000 to 10,000; what is important to note is that this

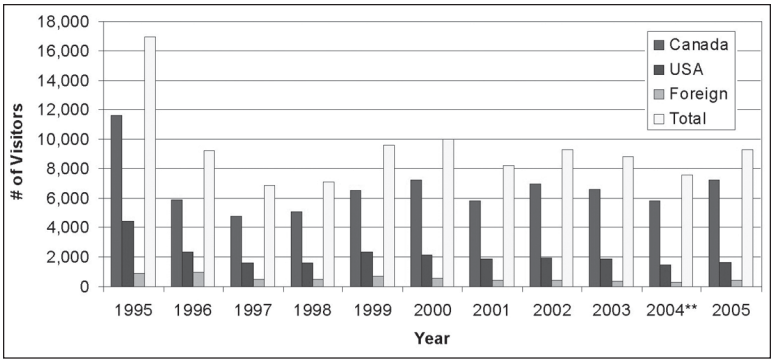

Figure 3: *Number of visitors to Marathon, 1995-2005. (Source: VIC)*

amount of consistent visitation has been achieved or maintained with relatively no product development and marketing. This suggests the untapped potential of Marathon to attract tourists (both domestically and internationally) once suitable products have been developed and marketing strategy has been determined.

Although there are a variety of reasons for visiting Marathon, an examination of choice for this destination illustrates that the top three reasons centre on recreation opportunities, and when combined with where people chose to stay, it is clear that camping is a key attraction in the region (Figure 4).

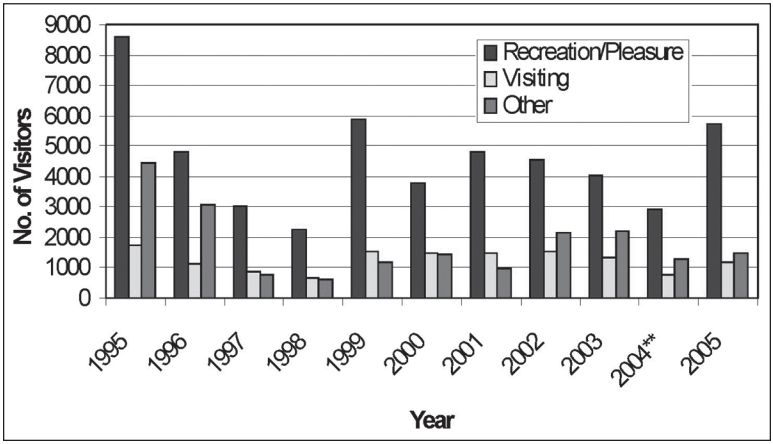

Figure 4: *Top three reasons for travel. (Source: VIC)*

Visiting Friends and Relatives (VFR) is also a key reason for visitation to Marathon – again a trend to be expected given the mobile nature of the baby boomer generation and their children. However, Gunn and Var (2002) suggest that this is a major market segment that should not be underestimated. Indeed, the VFR segment is an important component of rural tourism as it provides a positive word of mouth channel (Clarke 2005).

As previously indicated, camping is an important reason to visit and a source of accommodation for visitors to Marathon and the region. Perhaps more significant however is the fact that hotel stays have grown significantly since 1995, as indicated in VIC data. Hotel stays are important as they directly support local businesses in terms of accommodation owners, restaurateurs and other service-based retailers. The "other" category signifies the accommodation of visiting friends and relatives who stay with family.

Table 1 provides a summary of the length of stay of visitors. As we might expect, around half of all visitors stay one or two nights. What is surprising is that the next largest grouping stays more than 6 nights. The important trend in these statistics is that the length of stay is increasing. An examination of the trends in rural tourism expenditure indicates that the average expenditure for a domestic (i.e. Canadian) single overnight visitor in rural areas is $100 per tourist-visit[1], while the average is significantly higher for International visitors ($300)(Beshiri 2005a).

Table 1: *Average length of stay.*

Nights	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004**	2005
1	1675	875	768	812	1241	2249	2662	2812	2731	1840	2696
2	546	616	338	382	424	778	949	744	1040	639	903
3	210	381	129	172	123	291	327	357	383	211	373
4	124	300	61	142	72	173	250	244	204	111	210
5	82	210	38	251	31	85	141	93	185	131	115
6	29	168	18	34	27	44	56	157	77	55	119
> 6	214	972	85	310	103	279	185	301	366	212	571
Total	**2880**	**3522**	**3455**	**4915**	**4519**	**9386**	**8704**	**4708**	**4986**	**3198**	**4987**

(Source: VIC)

[1]Tourist-visit is a unit for measuring tourism participation, by counting each census division that a tourist visits as one destination.

The visitation data for Marathon and region indicates that there is a strong domestic market traveling to the region for its recreational opportunities, taking advantage of a variety of accommodation sources. In addition to a strong provincial market, Marathon receives a significant number of Canadian and American visitors. Much of the visitation to Marathon has been based on limited product and virtually no marketing, indicating the untapped nature of Marathon's tourism potential and the need for planning.

Undertaking Community-based Tourism Development in Marathon: Method and Process

This section provides a detailed explanation of how Reid's (2003) model was applied in Marathon. It does not provide the specific elements of the final strategic plan, as this paper is primarily concerned with analyzing the process associated with Reid's model.

Following the elements of community-based tourism development as previously outlined, the Marathon Tourism Action Committee (TAC) was struck in January 2006. A variety of individuals were invited to join the committee, including businesses, teachers, students, physicians, industry (mill and mine), Chamber of Commerce, Town Council, Ontario Parks, Parks Canada, and seniors. The resulting TAC was comprised of 13 community members with all aforementioned groups having representation excluding youth and seniors, who chose not to join. A chair person was selected from the group, and my role was the facilitator and research expert for the project. Monthly meetings were held February through June. The Editor of the *Marathon Mercury* (the local newspaper) attended each meeting and subsequently published articles about the TAC and its work. The TAC felt this would be an important way to keep the community informed and to invite additional participation of residents. As a result, several different individuals attended various meetings, though they did not continuously participate.

The TAC held its first meeting in February, at which time the Terms of Reference for the project were finalized and the Reid framework for tourism development was discussed. During this meeting, I provided the group with a distinction between market and product led approaches to tourism development. A market-led approach to tourism development is based on providing whatever attractions, facilities, and services the tourist market may demand (Inskeep 1991). Placing the emphasis on matching tourist products and appropriate markets is not always appropriate for rural areas, as it may not reflect the interests or needs of the local community and may

not be sustainable (both financial and over the long term) (Reid 1998). Such an approach could result in environmental degradation, loss of socio-cultural integrity of the tourism area, and may not provide even short-term economic benefits. Generally, market-led approaches are led by outside experts and do not reflect the interests or capacities of local people.

In contrast, a product-led approach is based on developing only those types of attractions, activities, and services that the community believes can best be integrated with minimum impacts into the local development patterns and society (Inskeep 1991). Often potential attractions are currently available and naturally existing within the community and only require infrastructural or informational development, varying in cost magnitude. The development of such attractions generally benefits both local people and potential visitors, and as a result support for such initiatives is often greater from local residents, making it more sustainable over the long term. Marketing is then developed based on attracting those tourists who find the available products of interest to them (Gunn and Var 2002; Reid 2003). Once tourist numbers warrant, additional infrastructure and 'fabricated' attractions can be constructed, on the basis of solid visitor numbers and research. The result is a tourism industry that is viable and sustained by visitation to the region, thus reducing dependence on primary industry and government programming. Such an approach requires time – it is not a quick fix, but rather one that is based on naturally occurring attributes within the community and region; acknowledges financial commitments and capacities of local governments; addresses the interests of local residents; finds ways to support local entrepreneurial initiatives; seeks to engage local businesses and attractions that are currently developed, and; plans for future developments that will be undertaken and sustained through visitation, not local expense.

This information provided an opportunity to discuss the philosophical basis for the types of development the TAC wanted to explore. Although there was one member who felt the committee should 'think big' and create an attraction to draw large markets, the remainder of the group were interested in product-based development, capitalizing on the tourism attributes present within Marathon for both resident and visitor enjoyment.

The March meeting provided the opportunity for the committee to review the previous tourism related studies conducted for Marathon. The studies were primarily concerned with Marathon's tourism potential, the identification of naturally occurring features (both physical and cultural) worthy of enhancement, and prioritized development options. Based on these previous documents, the committee discussed what had been accomplished, what was remaining and if these projects were still important. By the end of the meeting, the group had agreed on several general priority

areas that remained uncompleted from past reports and had identified some new opportunities. Each committee member left with a community inventory that they were to complete by the next meeting. The inventories were structured to identify various tourism related attributes (nature-based, recreation, heritage and culture, special events, community organizations and businesses) in the community, where they were located and what level of development was required.

Once the committee members had completed the inventories, I compiled the information and compared it against the priority areas that had been identified as a result of the past studies and emerging opportunities (Table 2). This comparison aided in the identification of existing and potential tourism attributes and what was required to facilitate their development.

By the April meeting the community inventory analysis and statistical data on visitor information were presented to the committee. The list of possible tourism developments was quite large, so committee members undertook to determine the most important aspects, utilizing a 'dotting' methodology (Reid 2003). In this exercise, participants are given a limited number of dots and are asked to place their dots on the items of most

Table 2: *Inventory data cross listed with tourism development priority areas.*

Priority Level – Short Term	**Plan in Place**	**Plan Required**
Gateway To the Community	X	
Peninsula Road Corridor	X	
Scout Forest		X
Pebble Beach		X
Visitor Information Centre	X	
Highway Signage	**X**	
Town Signage		**X**
Trails	**X**	
Recreation Activities		**X**
Tourism Education	**X**	
Priority Level – Medium Term		
Carden Cove (waterfront development)	**X**	
Pukaskwa National Park/Neys Provincial Park cross marketing		**X**
Prisoner of War		**X**
Mink Creek Signage and Trail Development		**X**
Partnership Building between organizations	**X**	
Customer Service Training		**X**
Priority Level – Long Term		
Peninsula Road Redevelopment and Beautification	**X**	
Tourism Packages		**X**
Artist Tourism based on the Group of Seven		**X**
Tourist Train	**X**	

importance to them. Those receiving the most dots are considered to represent the groups' collective priority. This exercise results in a smaller number of development projects, which the committee then categorized as short, medium and long term goal categories (Table 2).

During the May meeting, the committee reviewed the previously determined prioritization, this time linking each "project" area with existing community groups, provincial government ministries, Lakehead University or individuals that would be involved in implementation. The group felt that it was important to clearly identify such groups and to outline an implementation strategy to ensure that the strategic plan could be carried out. The fear was that because much of the implementation could fall to volunteer groups, the plan could falter.

The subsequent months of June and July were spent by me drafting the strategic plan and sharing drafts with the committee. After several revisions, the final draft was put on to Marathon's website *<http://www.town.marathon.on.ca/>*, and copies were provided at the recreation center and at the public library. A newspaper advertisement was placed in the *Marathon Mercury*, announcing a public meeting and inviting residents to view the document and attend the meeting to provide their input. An email address was also provided, inviting people to send their comments. During the week of the August 28th meeting date, several radio interviews with the TAC chair and announcements were made, informing listeners about the plan and reminding them of the meeting. The public meeting was held on August 28th, which no Marathon residents attended. The *Marathon Mercury* subsequently ran a story explaining the work of the TAC and the elements of the strategic plan. Residents were invited again to view the document and submit their comments to the TAC. No additional comments were received and the final draft was completed and submitted to Town Council in September, which approved the document and its recommendations in October 2006.

Discussion: How Theory Intersects with Practice

As the preceding account illustrated, Reid's planning model provided a 'user-friendly' structure to develop tourism in a bottom-up fashion. As the arrows in Figure 5 indicate, the Strategic Plan developed by the TAC focused on the 'Gearing Up' and 'Community Assessment and Organizational Development' phases. The intent of the planning exercise was to identify the tourism attributes present within Marathon and develop an implementation strategy for their development. The actual product development and marketing strategy will be conducted at a subsequent

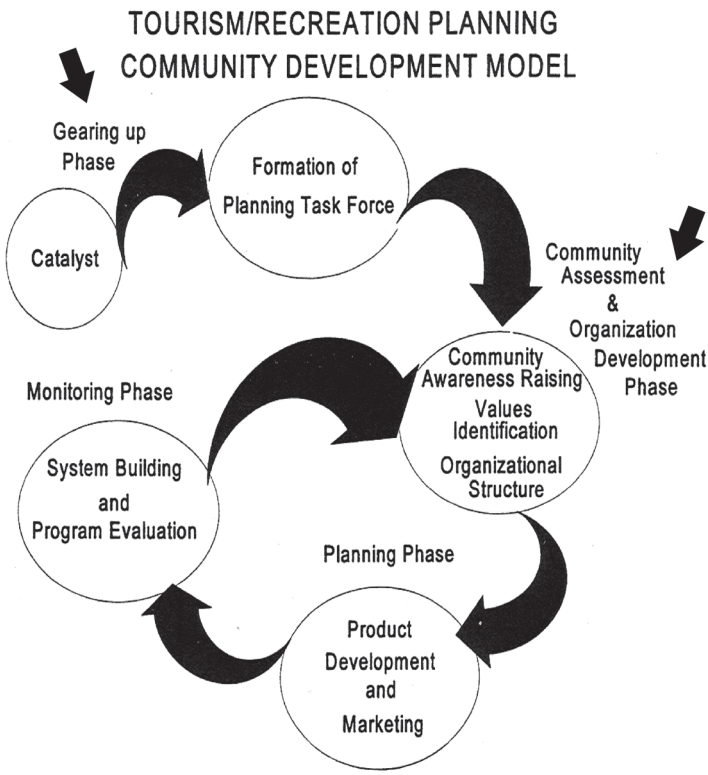

Figure 5: *Areas of focus for the Marathon Planning Process. (Read, 2003)*

time. One of the primary recommendations was to have the TAC established as a Committee of Council, which would give it a reporting structure and responsibilities within the Marathon Town Council. This recommendation was approved by Council and as such, the TAC can now undertake the planning and marketing strategies recommended in the report. In addition, the TAC identified the importance of ongoing monitoring of progress and impacts of development on the community, as stated within the strategic plan.

The 'Gearing Up' phase certainly reflected Reid's model, with the EDO acting as the catalyst of the project. His recognition of the importance of economic diversification in the community, combined with a lack of available time to conduct the strategic planning exercise himself and the need for some outside expertise to legitimize the process, resulted in his contacting me as facilitator. He was interested in having someone who

understood the importance of community involvement and the realities of rural communities in terms of limited funds and a strong reliance on volunteers. As a result of work I had completed for him in the past, he contacted me and we discussed how we would proceed to develop the 'task force'. He undertook a 'shoulder tapping' exercise, personally inviting a number of different people representing a variety of organizations and agencies in the community, along with open invitations to the residents at large. This resulted in the formation of the Tourism Action Committee (TAC), as previously described.

The 'Community Assessment and Organizational Development' phase also closely mirrored that expressed in Reid's model. An examination of previous studies helped in determining historical views towards tourism and what the developmental priorities had been. This allowed the committee to envision what types of tourism development they viewed as appropriate within the current context. In addition, an analysis of the visitor statistics helped the committee to understand the present state of their tourism industry, which illustrated that despite any development of product or marketing, visitation was fairly significant. Subsequently, the TAC undertook an inventory of current tourism and recreation related attributes in the community and immediate region. This exercise served the dual purpose of aiding the committee in prioritizing development areas, and perhaps more importantly, the exercise engendered a sense of pride as it indicated the extent of options available. As a result of this work, the TAC was able to identify actions that needed to be undertaken, they were able to prioritize these project areas, and they also identified potential partnerships with existing community groups and organizations. In addition, the TAC determined general implementation strategies for each prioritized project area along with a time frame for development. All of these steps were concluded with the development of a planning document entitled '*Strategic Planning for the Development of Marathon's Tourism Attributes*'. As indicated, the document was shared with the community more broadly through a variety of venues and was approved and accepted by local government.

According to this assessment, the process should be considered successful as it was not difficult to implement Reid's model and it did provide a satisfactory outcome for those involved (i.e. the TAC). However, when the process is examined through a community participation lens, the analysis is less favourable. Blackstock's (2005) assessment of community-based tourism resulted in three criticisms: she contends that despite the rhetoric, there is limited transformative learning; communities are assumed to be homogeneous, and; there is limited acknowledgement of the external constraints to local control. These criticisms provide a framework for

evaluation in this case study, excluding the homogeneity criticism. Reid (2003) spends considerable time in his book discussing the complexities of community, cautioning against ever assuming uniformity of opinion, goals and objectives.

Certainly Reid's focus on social learning and mobilization has at its core, the intent for transformative learning. Although this was not prevalent in my mind during the process, reflection and discussions with committee members reveals that there were degrees of learning that did take place for the committee members (and certainly for me as the facilitator). One of the challenges of rural tourism is the lack of embeddedness of the industry (Koster 2005). Rural communities built on extractive industry understand how that industry works, but rarely do they comprehend the complexities associated with the service industry and tourism. One of the outcomes of this strategic planning process was increased understanding of how tourism operates, how the community can harness its benefits and that monitoring of the outcomes to manage any negative impacts is necessary.

However, because tourism is not an embedded industry within the community, I believe this contributed to the lack of wider community participation in the consultation phases. Because Marathon still has a profitable mill and mine, residents are not concerned with economic diversification, especially in terms of industry that they know little about and which does not appear to offer the economic windfall that extractive industries do. The economic situation or where the community is at in their resource based economy life cycle likely influences participation - tourism is not part of their current economic thinking.

Blackstock's (2006: 44) concern regarding the external constraints to local control and participation centre primarily on external interests limiting decision-making participation due to fears of it increasing the 'costs of doing business' and instead, "public participation is often reduced to a legitimizing process of approval". As indicated in the case study of Marathon, there was no broader community participation in the evaluation of the strategic plan, beyond that of the TAC members. No comments were received regarding the document and no one attended the meeting held to discuss the final draft of the document.

Although somewhat disappointed by the lack of attendance and comments on the document, committee members were not surprised. The general sentiment was that it was typical of Marathon residents as generally, unless the topic of discussion is contentious or has the potential to bring in multiple jobs, people do not attend meetings. The EDO echoed this sentiment, indicating that when he held a meeting to discuss the potential for expanded mining exploration, they 'filled the house'. From his perspective, every opportunity had been provided for people to provide

in put on the plan, so he was not concerned about the lack of participation from the wider community.

As the facilitator and self-proclaimed 'community-based researcher', I was less sanguine. I felt that there could have been more attempts at community consultation and involvement, but our time lines were restricted by the impending municipal election in October of 2006 which determined the period within which the planning process had to take place. It was important to the committee to have the document approved by council before the election so that their work would not be disregarded by a new government. As a result, the length of time to conduct small group meetings with various members of the community as suggested by Reid (2003) was not feasible.

Acknowledging that community members may participate in tourism development to varying degrees, Tosun (2006) has developed a typology of participation with three categories. The first is *spontaneous participation*, representing an ideal type in which full managerial responsibility and authority lies with the host community. The planning is completely bottom-up and transformative learning is paramount. The second level is *induced community participation* in which the community is "allowed to hear and be heard" (Tosun 2006:495) but theirs is only one voice of other and often more powerful interests, such as government or industry, resulting in participation that is often passive and which could be considered as tokenism. Finally, *coercive community participation* is a manipulative and contrived form of input, where power holders are merely interested in educating the local community. Some decision making may be given to local leaders, but only insofar as to prevent outright hostility towards tourism developers and tourists. Tuson (2006) concludes that participation in tourism by different interest groups varies with differing groups' power, objectives and expectations from community participation.

The participation received in the entire process (from developing the TAC to evaluating the strategic planning document) would fall between spontaneous to induced participation. Despite a rather cavalier attitude at the lack of broader community participation, both the EDO and the committee members had hoped for interest in and comments on the strategic plan, believing that such participation would aid in building a strong diversified tourism product and by extension, local economy. However, as discussed previously, a lack of perceived need for economic alternatives at this time likely decreased the desire to give summer hours over to analysis of a tourism project.

There are some additional questions that this process raised, from a facilitators perspective. Had this been a research project, dictated by my time lines as a Primary Investigator, it may have allowed me the time to

more fully engage community members in a 'spontaneous participation' format. However, given the committee members views, it is hard to say how or if this would have made a difference. Indeed, research by Vernon *et al.* (2004) suggests that various factors including available time, concerns over how contributions will be utilized, and flow of information can affect membership and participation.

As the 'external expert' in a community-based approach to tourism development, I witnessed the establishment of a TAC with a membership that was largely skewed to the interests of tourism (retail, accommodation, food and beverage, attractions) with limited representation from other potential community interests. In fairness, a larger number of individuals, representing these other areas, were invited and encouraged to attend. However, I was plagued with wondering what role or right I had in dictating the membership content of the committee. In addition, I struggled with my role in the committee and process. Did my presence influence how much of the process was still 'top down'? How much did my own *inexperience* influence the way things went?

Korf and Oughton (2006: 284), in discussing Participatory Rural Appraisal methodologies, suggest that participatory processes are played out in arenas of negotiation, which are, "contested space[s], where power differentials play a key role in various negotiation lines, within community as well as between different agents in the community and outsiders". In my case, much of the negotiation occurred between myself and the EDO, though we shared similar philosophies regarding the direction the project could (and should) take. It is unclear how much his vision was shared by the larger group or the community. What is clear is that my own ideas reflected his, and it is very likely that this resulted in a power position for me as facilitator and so-called expert over the group. Korf and Oughton (2006) in citing the work of Cooke and Kothari (2001) suggest that one of the arenas of tyranny associated with participatory approaches is in decision-making; often development approaches are imposed from the outside and facilitators tend to dominate the process. Certainly it would appear that although most suggested project areas and implementation strategies came from within the committee members, the framework for undertaking the project and its product-led approach were largely a result of my 'information provision' and negotiations with the EDO.

In their evaluation of collaborative policy making for sustainable tourism, Vernon *et al.* (2004) found that academic researchers involved as 'partners' in the collaboration ended up having greater power over other partners due to their expertise, the realities of research pressures which did not provide adequate time to get reports to committee members for their review, and the responsibilities of report writing. They suggest these

veracities point to the difficulties of making theories of collaboration a reality. My own experience in the case of strategic planning in Marathon would echo these sentiments.

Conclusion

Through this analysis it is apparent that Reid's (2003) model for community-based tourism planning is an effective way to undertake tourism planning that is inclusive of community members. However, as several authors have indicated through experience or critique, it is the community participation portion of such methodologies that is challenging. Indeed, Reid does not minimize the difficulties associated with community inclusion in the planning process, but written texts somehow diminish the realities of the challenges.

The important question to ask is if these challenges warrant a disregard for the method, or are there positive outcomes, albeit limited from what theoretical models purport, that make the process worth while? Certainly those participating in the TAC felt the group had accomplished a task worthy of implementation. The ratification of the document and its recommendations by Marathon Town Council legitimized their efforts. The accomplishments of the TAC, though guided by an outside expert, were achieved through their own inspiration, vision of possibilities for their community, and a desire to share their uniqueness. Though I may have been their scribe, the committee members provided the content. As such, I would argue that despite the challenges, community-based approaches to tourism development, like the model presented here, are a positive step towards sustainable community development. What this research points to is the need for continued research into how we can effectively engage community members and how, as researchers we can integrate ourselves as part of the process on an equal level.

As a prologue, the TAC has continued to function and have begun implementing two of the projects (creation of a community map and the development of Pebble Beach) with hopes of completion for the 2007 tourist season.

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Chasing Twenty-first Century smokestacks: tourism research in the British Virgin Islands

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Abstract: "Chasing Smokestacks" has become well-known if not complimentary terminology to describe the actions of villages, towns, regions, and countries wanting instant economic development, often at almost any cost. In the past the smokestack referred to was a conventional industry – such as Maple Leaf Pork or J.R. Simplot (fertilizer production) in Brandon, or oil refineries and alumina smelters in St. Thomas (U.S. Virgin Islands). The contemporary smokestack for many places, such as the British Virgin Islands, is tourism — ironically stereotypified by the large smoke-stacked cruise ships of the Holland America Line or Cunard ships such as the Queen Mary 2. Although mass tourism cruise ships are only one part of the BVI tourist puzzle, they are seen to be important both financially and symbolically and are accepted at almost any cost. But tourism in the BVI is much more than what many feel are 'down-market' cruise ships and short-stay beach tourists. The BVI are also aiming for 'up-market visitors' such as those who own or rent yachts, dive and/or snorkel, as well as snowbirds who stay for greater lengths of time and expats who settle-in for several years and contribute significantly both to the economy and society of the Islands. Many of the former stay on their (or rented) yachts, buy from local businesses, and frequent locals restaurants and bars The snowbirds and expats typically live in large, expensive homes or villas that are keeping the construction industry at full stretch. This paper (a) briefly discusses the geography of the British Virgin Islands and (b) outlines a preliminary investigation of tourism in the BVI. It is suggested in this paper that the late start for tourism in the BVI (compared to for instance the US Virgin Islands, or Jamaica) has allowed the territory critical breathing space within which to evaluate exactly what it wants from the industry.

Key Words: British Virgin Islands, Tourism Demand, Tourism Supply, Place, Landscape

Introduction

Tourism can be a blessing or a curse, and it is easy to cite examples of each possibility. For example, in his book entitled the "Rape of the American Virgins", Edward O'Neill (1972) argued that it has been the latter for the US Virgin Islands, where for him tourism has become just another bad example of the practice of buying economic growth (with financial incentives and/or tax incentives) known as 'smokestack chasing' (Black and Chandra, 1996).

The purpose of this paper is to describe the background to and the current state of tourism in the British Virgin Islands (BVI), using data from archival and bibliographic sources, fieldwork and key informant interviews, collected during parts of 2004-2006. This topic is important for two reasons. First, on a larger scale, tourism is the largest industry in the contemporary world (Hall and Page, 2002), and a better understanding of how it has developed and how it operates today will enable us to better understand this industry. This in turn may help us to help the industry grow in a more sustainable manner in the future. Second, on a more local scale, tourism is one of the two major contemporary sources of income (along with international finance) for the BVI. As Wilkinson indicates, further research on detailed case studies, such as this of the BVI, is warranted in order to examine the way tourism operates in a microstate context (Wilkinson, 1989: 172), and a better comprehension of this industry is necessary in order to give an insight in to the potential future success of this microstate within the contemporary globalising world.

The paper will first of all 'set the scene' for understanding tourism in the BVI by discussing some of the major facets of the historical geography of the Islands, and thus by laying the basis for tourism potential within this territory. Second, the development of the economy will be briefly discussed so that the basis for the present policies regarding the perceived economic value of tourism can be understood in context. Third the contemporary economy of the BVI will be discussed, and in particular the current status of tourism as part of that economy will be outlined. It is suggested that the late start for tourism in the BVI (compared to for instance the USVI, or Jamaica) has allowed the territory critical breathing space within which to evaluate exactly what it wants from the industry. In the conclusion, the future of tourism in the British Virgin Islands as a blessing or as a curse will be mooted.

Figure 1: *Location of the British Virgin Islands.*

Background to the BVI

The Virgin Islands are an archipelago in the Leeward Islands in the Caribbean Sea (Figure 1). The islands are politically divided into two major parts, one of which, the British Virgin Islands to the east and north, is a British overseas territory under the sovereignty of the United Kingdom.[1] The major islands are Tortola, Virgin Gorda, Anegada and Jost Van Dyke. The other part, the Territory of the Virgin Islands of the United States (commonly known as the U.S. Virgin Islands - USVI) to the west and south, is an unincorporated and organized United States territory (Figure 2).[2] The major islands are St. Thomas, St. Croix, and St. John.

The USVI (then known as the Danish West Indies) were purchased by the USA for $25 million during the First World War (1917) from the Danish government (which bought them from France in 1773). While the USA government sought to purchase these islands in the late nineteenth century, it was not until the war years that their potential use as a base for protecting U.S. shipping from German submarines finally led to their acquisition. The US Virgin Islands have more than double the land area of

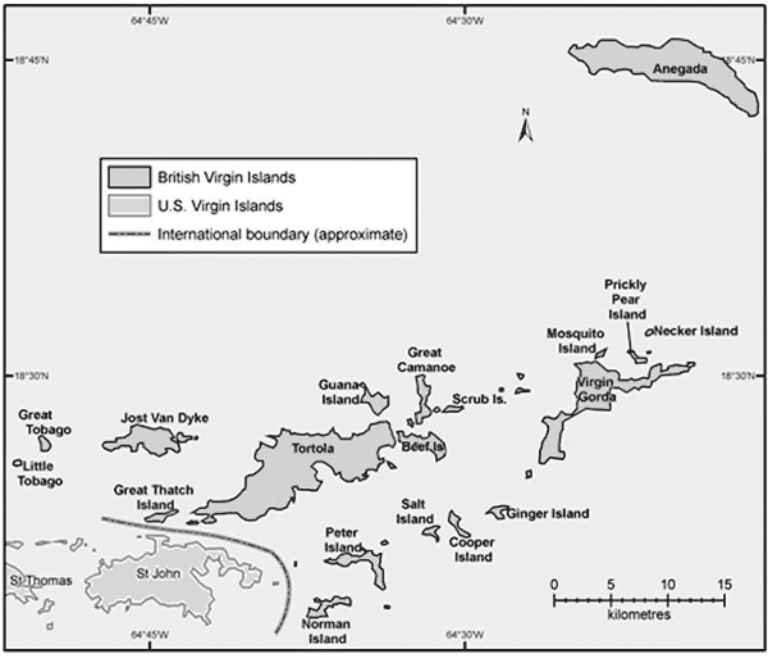

Figure 2: *The British Virgin Islands.*

the BVI but more than four times the population. The BVI have a total population of some 23,000 (2006 est.; it was 7,600 as recently as 1958), although fewer than half of this total are BVI Islanders, the balance being "down islanders" - or "black expatriates" - and "white expatriates" ("expats"), who are either working in the Islands or who have retired there from elsewhere. The make up of the BVI population is comparable to that of the USVI where just over 40% of the population is "native-born" (Johnston, 1990).

The USVI have long been culturally and economically connected with the British territory, and consequently their present day geographic situations are also interrelated (Bowen, 1976). As with most countries, an understanding of such aspects of the history of the BVI is essential to a comprehension of the present, as well as its future, potential within the tourism industry. The Virgin Islands, like other parts of the Caribbean, were originally settled by the Arawak, and later by Carib Indians, before the arrival of the Europeans. The Virgin Islands were sighted by Christopher Columbus on his second voyage (in 1493) and named by him after Saint Ursula who by legend had a following of 11,000 virgin maids (Santa Ursula y las Once Mil Virgines).[3] The Dutch established a small but permanent

settlement on Tortola in 1648. In 1672, the English arrived in the region and annexed the Islands, removing the Dutch populations from Tortola in the same year and from Anegada and Virgin Gorda in 1680. However, Dutch influence, particularly in toponyms and family names, can still be found.

The various struggles with Spain, France, Denmark and other European powers have also left their mark on BVI history – and to some extent its present. As with many other parts of the Caribbean, there have been a series of disputes over the ownership of the Virgin Islands. The British Government essentially gave up its claim upon what are now the USVI in the early eighteenth century (although they were occupied by Britain for a time during the "French Wars" of the early nineteenth century), and British claims to the BVI were not "definitively settled" until 1735 (Dookhan, 1975: 13).

The struggle over sovereignty lasted so long in large part because the Virgin Islands were (correctly) not regarded as valuable plantation colonies. While they were prized by the Danes for their trading possibilities, and by pirates and buccaneers for their harbours and hiding places, there was little other perceived economic significance. Arguably the British claimed them at least in part in order to keep other powers out of the region. To some extent the lack of British interest became a self-fulfilling prophecy and hindered economic development (and this continued to be the case until quite recently). Interestingly it is the potential for trade (in particular now international finance) and the physical geography (for sailing, diving etc.) of the Islands that is now once again working in their favour. The relative insignificance of the BVI compared to other West Indian nations did, however, influence most of the Islands' history. In the definitive work on the West Indies by Maingot, Parry and Sherlock (1987) the BVI are only mentioned once, and even then it is only as an adjunct to a comment on the USVI.

Piracy and buccaneering was characteristic but not regionally significant within the BVI in the late seventeenth and early eighteenth centuries (Botting, 1978; see <*http://www.b-v-i.com/Culture/Pirates/pirates.htm*>), but nonetheless this lifestyle has been used to create a sense of place for tourists ("The Treasure Isle Hotel", "The Jolly Roger Inn", "Pirates' Bight", etc.). Although never major pirate strongholds (like Tortuga, or Port Royal in Jamaica), several of the Islands, including Jost Van Dyke, Norman, Peter, Thatch [from Teach = "Blackbeard"] and Dead Chest ["yo ho ho and a bottle of rum"] have piracy-derived toponyms. The Sir Francis Drake Channel, once called "Freebooters Gangway" (Pickering, n.d.), is a major waterway through the BVI connecting with the USVI, and Norman Island, south of Tortola, is said to have been the setting for Robert Louis Stevenson's "Treasure Island".

In total the BVI consist of about fifty islands, mostly of volcanic origin (Figure 2). Sixteen of these islands are inhabited, but only four are of major significance.[4] These include Tortola (62 sq. km.), Virgin Gorda (22 sq. km.), Jost Van Dyke (9 sq. km.), and Anegada (34 sq. km.), which is a coral atoll. Many of the other islands are quite small (such as Dead Chest, which is close to Peter Island) and others are essentially just rocky promontories that are a hazard to navigation but a boon to water tourism (such as Fallen Jerusalem and The Indians which are close to Norman Island). At 153 sq. km. the BVI is a true microstate, with an area just smaller than Washington D.C.

Tortola (the name might derive from "turtledoves" in Spanish) is the largest and most important island with the largest population (19,282).[5] It has many tourist attractions and Beef Island (connected by a causeway) is the location of the only international airport in the BVI, although much of the travel to and between the BVI is via ferries or private boats. Tortola was at one time an important local-region plantation island, although it never rivalled the major sugar islands of the British Caribbean. Consequently, it still has some remnants of a sugar landscape, although only a few sites have been preserved to the extent of being tourist sites. Roadtown, the BVI capital and most significant settlement is located on the south coast of Tortola. It is the home to a variety of governmental and tourist services as well as the Cruise Ship Dock and a number of major yachting facilities.

The islands were administered variously as part of the Leeward Islands Colony, or with St. Kitts and Nevis, with a Commissioner representing the British Government on the Islands. The Federation of the Leeward Islands was dissolved in 1956 and the Islands became autonomous with a new constitution in 1967. This changing state of affairs reflected both the disinterest of the British Government in the territory and the desire of the Islanders to be separate from other authorities within the Caribbean (Dookhan, 1975). They refused to be part of the short-lived Federation of the West Indies (1958-1962), not wishing to give up their recently acquired powers, and this desire for independence has helped to shape the national identity of the BVI. Thus although there have been unofficial suggestions that a union with the USVI might be advantageous, such an option has been resisted, and with the recent economic development of the BVI has been seen as both less necessary and less advantageous (Dookhan, 1975).

In addition to political change, there has been a considerable amount of variation in agricultural practices, which has been important in building the 'sense of place' within, or 'personality' of, the Islands. The English introduced sugar cane to the Islands in the early 1700s, which was to become, along with cotton and indigo (indigo dye is an important dyestuff

with a distinctive blue colour), the major plantation crop and the source of foreign trade. Slaves were brought from Africa to work on the sugar cane plantations, as well as being used to produce the other crops. Although many plantations were established, only a few ever became wealthy, and those not for very long. Sea Island cotton production was important at some time periods but finally disappeared as the result of competition from cheaper cotton from the U.S. South. Natural indigo was the only source of the dye until about 1900, but after this date synthetic indigo almost completely superseded natural indigo. Indigo production suffered from the introduction of synthetic dyes.

The sugar plantation system in the BVI collapsed after emancipation, and most of the white population soon left for pastures anew – in the late 1950s there were only "some thirty white persons resident in the Colony" (British Virgin Islands, 1960: 8). Other than one working rum distillery (at Cane Garden Bay on Tortola), which now imports much of its sugar, evidence of the sugar plantations is almost completely missing today, and evidence of cotton and indigo cultivation is even sparser. However, this agricultural history has left its imprint on the contemporary population, which is now 82% black (mostly descendents of plantation slaves), 6.8% white, 5.9% "mixed", 3.0% East Indian, and 0.3% "Indigenous People".

After the fall of cotton, agriculture deteriorated into subsistence peasant cultivation as the islands became even more isolated from the 'home country' as well as much of the rest of the Caribbean. In addition to the small size and the scattered distribution of the islands, poor land quality, a poor climate, and rugged topography, made agriculture a difficult proposition. As a result, economic backwardness was characteristic of the Islands for over a century, and was reflected in many aspects of their geography. For instance, until recently there were poor communications systems both within the colony and with the outside world, poor housing and poor services such as water supply, sewage disposal, and electricity. Industry was more-or-less non-existent and out-migration (to the Danish West Indies and elsewhere) was a survival tactic.[6] Significantly, however, contacts with the Danish West Indies (now the USVI) continued and strengthened, and this connection has continued to the present day. Up until recently there was an important trade in cattle (the principal export for many years) from the BVI to the USVI – referred to by the British government as "the backbone of the economy" (British Virgin Islands, 1960: 4). In addition, the sale of charcoal from the BVI to the USVI helped the balance of trade in the BVI, and there are numerous familial bonds between the two jurisdictions. Today both of these trading commodities have declined, and have been replaced by more lucrative endeavours such as tourism. As a side benefit, the environment is now recovering from some overgrazing,

and the vegetation is recovering from the tree cutting necessitated by charcoal production. Both changes are making the islands visually more attractive to tourists.

The BVI society is one where religion and churches have always played an important role (Bowen, 1976), and have helped to give the BVI a distinctive character. Before tourism arrived, the church was the main link to the outside world, and a major influence within the educational system, particularly for the rural areas and the outer islands. The BVI is 86% Protestant, with Methodists having 22.7% and Anglicans 11.6% of adherents; only 9.5% are Roman Catholic. After an early but short-lived Quaker influence (Pickering, 2000), the Methodists were the first missionaries in the BVI, with the Church of England entering in response to their presence. As an indicator of recent change in the Islands, less-mainstream groups such as the Church of God (11.4%) are gaining ground, in addition to a variety of other numerically smaller groups (BVI Census 2001). The strong religious influence within the islands is reflected in a number of behaviours that include what one source calls "mannerly behaviour" such as standardised greetings, and a right to privacy (<*http://www.everyculture.com/Bo-Co/British-Virgin-Islands.html*>). In addition, it is suggested that "down islanders" (people from other Caribbean islands working in the BVI) can often be distinguished from locals as they smoke cigarettes much more commonly. Also an unofficial dress code exists and it is pointed out to tourists that too-scantily-clad dress is frowned upon.

The BVI remained of some strategic importance to the British after the plantation era, but as noted earlier little was done to develop them economically. This remained true well into the twentieth century and in the late 1960s one of the major (and few) sources of outside income consisted of postage stamps – for collectors rather than postal use. Although the relative importance of postage stamps as an income source for the economy has dropped, it still produces a useful supplement to the budget of the BVI.

Since the early 1950s many BVI residents have migrated to St. Thomas to work in the tourist industry, which grew there at an earlier date than in the BVI, and much of the money earned was returned to the Colony (British Virgin Islands, 1960: 4). This made the BVI aware of its possibilities as a tourist site, and the Beef Island Airport was constructed in the late 1950s to enhance this potential. Regular ferry service began about the same time (British Virgin Islands, 1960: 5). Significantly at this time there were only two hotels in Roadtown, the capital of the colony.

Since the 1960s, the Islands have diversified away from their traditional subsistence agriculture-based economy towards tourism and financial services, becoming one of the richest areas in the Caribbean with a per

capita GDP PPP (Gross Domestic Product at Purchasing Power Parity) of US$38,500.[7] Unfortunately, this income is unevenly distributed and this is reportedly the source of some unrest.

The Economy

The Earl of Cumberland sailed through the BVI in 1596 and described them as "a knot of little islands, wholly uninhabited, sandy, barren, craggy" (HMSO, 1960: 43). Although this description was extreme even for the sixteenth century, it did characterise the British opinion of the economic potential of the BVI for much of their history. Except for a few time periods of plantation prosperity – usually during wars - the BVI up until the last few decades have been characterised by a subsistence economy. Although good data sources are few and far between, there is a benchmark study for 1957 and 1958 that describes the situation very well (HMSO, 1960). It should be noted that in the late 1950s the colony was "conscious of its tourist potential" (HMSO, 1960: 42), perhaps because the USVI was beginning to experience rapid changes, in part associated with the growth of tourism. However, virtually nothing had been done to exploit this potential. A Hotels Aid Ordinance was passed in 1953 to try to encourage hotel construction, but by the end of the decade there were still only four hotels in the BVI. Significantly for the future of the tourist trade, and because of traditionally close links with the US Virgin Islands, the British Virgin Islands have used the US dollar as its currency since 1959. One US 'popular' publication suggests that the stability of "U.S. dollar economy is the biggest selling point in the British Virgin Islands" (*The 2005-2006 Cruising Guide*).

In 1946, 72% of the male working population was involved with agriculture, forestry, fisheries and hunting. By 1960, this proportion had declined to 45%, but the economy was clearly still centred on these occupations (HMSO, 1960; Bowen, 1976). As mentioned earlier, agriculture had virtually always been marginal in the BVI. Distance from island to island coupled with overall distance from external markets, coupled with a challenging physical environment (rugged topography, poor soils, low and variable rainfall), were the major drawbacks – and they were, for the most part, insurmountable. The situation was exacerbated at this time by the tendency of many BV Islanders to give up attempting to survive on agriculture, and to urbanise within the BVI, or to spend lengthy amounts of time working in the USVI where there were more and better paid jobs. Many of these people eventually settled in the USVI. As the British government acknowledged, in a typically understated fashion (HMSO,

1960: 19), "The Colony…. is at a disadvantage when it comes to agricultural development."

Cultivation was almost exclusively for home consumption, with any surplus being exported to St. Thomas. Subsistence 'shifting cultivation' was typical of crop production: it was noteworthy that the first two tractors were brought to the islands in 1956 by the Department of Agriculture. In 1958, less than US$19,000 was raised through the export of vegetables, fruits and fish. Livestock production had become more important due to a steady market in the USVI, with nearly US$121,000 being made in 1958 from the export of livestock, three quarters of which went to St. Thomas. In recent years, agriculture has continued to decline, as it is unable to compete with overseas employment or the tourist industry, a similar situation to that of the USVI two decades earlier (Dookhan, 1971). Contemporary agriculture (consisting of only food crops and pasture) now accounts for less than 10% of the national income (<*http://www.everyculture.com/Bo-Co/British-Virgin-Islands.html*>).

While economically, the colony was largely ignored by the British Government in the 1950s, as it had been even during much of its history, the colonial power often had to help offset the adverse trade balance of the BVI (for instance, during the 1950s (HMSO, 1960: 15) with (albeit small) infusions of money). Manufacturing by any definition was still almost non-existent in the late1950s, and what there was operated on a small scale. There was some rum distillation, boat building, concrete block manufacture (for construction), soft drink production, and limited craft making. Forestry was similarly lacking, in part because of the cumulative effects of agriculture, and partly because of ongoing charcoal production (the fifth leading export of the BVI with about US$5,000 worth exported to St. Thomas in 1958). Only a small fragment of xerophytic rain forest remained on Sage Mountain, which is now protected by a national park.

The lack of development of the BVI in 1960 was further typified by the virtual lack of electricity (only to Government House, the Hospital and the Administration Building in Roadtown), the limited telephone service, and the lack of banking. As Bowen puts it, "People sent their money to St. Thomas and put their trust in God" (1976: 71). In addition there were poor communications within and between the islands. There were twelve miles (under 20 km) of "motorable road" on Tortola to serve the 86 registered motor vehicles and 261 bicycles at the end of 1958. There were also 60 miles (under 100 km) of unsurfaced roads and tracks on the islands, some of which were passable by Land Rover or Jeep (HMSO, 1960). There are still justifiable complaints about the roads in the BVI, but considerable progress has been made since 1960 (Dookhan, 1975), and arguably

communications is the area most beneficially affected by the economic resurgence of recent years.

Thus in the late 1950s the BVI was a poor, economically backward, remote and largely ignored colony of the United Kingdom that was trying to divest itself of such responsibilities. The situation of the BVI did not look promising, but there was change on the horizon, and much of this was the result of luck rather than judgement. The first piece of luck was a rise in disposable income (the "affluent society"), particularly after the Second World War, but more so in the 1960s and succeeding decades. Coupled with this was the second fortuitous circumstance, which was a rise in demand for recreation and more to the point tourism, by the people with this surplus income. Third, there was the rise of long distance air travel. In time this was going to make many new tourist destinations reachable by air, but in the short term, as argued by O'Neill (1972), it hurt passenger liner traffic and led to these ships (such as the famous trans-Atlantic steamers United States, the Bremen, and the France) being transferred to the Caribbean cruise trade.

The fourth circumstance was the assumption of power by Fidel Castro in Cuba, which led (after US-Cuban diplomatic relations were broken in 1961) to several hundred thousand Americans searching for another place in the sun. Many chose a path of less resistance and began travelling to the USVI (in 1955 there were some 91,000 visitors in this jurisdiction and by 1962 nearly 300,000). In time, some of these spilled over to the BVI, which then started to become a destination in its own right (Dookhan, 1975: 231). By at least the late 1950s, the BVI had become a mecca for the sailing fraternity, although facilities were still somewhat limited (Eggleston, 1959). In 1962, the promotion of tourism became a 'firm policy' of the Islands' administration (Cohen, 1995), and has become a mainstay of the economy since that time.

In 1964, the first 'resort' was opened, Little Dix Bay on Virgin Gorda, by the (Laurance) Rockefeller interests – which were already firmly entrenched on the USVI. This resort is credited with being the springboard for modern tourism in the BVI (Bowen, 1976). Virgin Gorda ("fat virgin" in Spanish) is the third largest island in the BVI with the second largest population (3,203). Its largest settlement is known as The Valley or Spanish Town, and this was the first capital of the territory. Other than Little Dix, there are several important tourist sites on Virgin Gorda, including The Baths (now a National Park), a Copper Mine (also a National Park) that once employed Cornish miners and claims to be unique to the Caribbean, and a number of other beach-oriented resorts in addition to Little Dix, such as Biras Creek, and Leverick Bay.

A fifth piece of good fortune is the fact that the BVI got into the tourism industry at a later date than other countries such as the USVI and Jamaica which are often held up as negative models for the industry (O'Neill, 1972). There is evidence that this late start for tourism in the BVI – and other places such as Belize (Ramsey and Everitt, 2005; 2007) – has allowed the territory critical breathing space within which to evaluate exactly what it wants from the industry.

By 1960, "it was generally agreed that the development of the islands would depend upon tourism"…. but it "was also quite evident that the Colonial Administration had little intention of initiating development" (Bowen, 1976: 73-74). However, in 1966 a BVI government-commissioned report targeted tourism as the most viable development option. Since the early 1970s, the government of the BVI have been concentrating on the "controlled growth" of the economy (Cohen, 1995), and this policy is clearly tied closely to tourism. If we fast-forward to the present day we find that the contemporary economy is reputedly one of the most stable and prosperous in the Caribbean. The list of industries is similar to that of the late 1950s, with two important additions, tourism and financial services. The significance of these additions cannot be overstated, as together they reportedly generate about 90% of the Islands' income (<*www.everywhereculture.com/Bo-Co/British-Virgin-Islands.html*>).

The BVI are now highly dependent on tourism, which generates an estimated 45% of the national income. An estimated 350,000 tourists, mainly from the US, visited the islands in 1998. In 2003, the number of 'visitor arrivals' was 599,102 and in 2004 it was 806,120 (*The BVI Standpoint*, 2005). This was more than 35 times the total BVI population – in 1989 the figure had been ten times (Cohen, 1995). One danger of this dominance showed when tourism suffered in 2002 because of the lacklustre US economy following 'September 11th' (Dawson, 2005).

Tourism in the BVI is multi-faceted. It includes water tourism (yachting, diving and fishing), land tourism (for tourists, snowbirds and retired expats), and cruise ships (which entail the use of both water and land). Efforts are being made to diversify sources of tourists, with Europe being a particular target (Dawson, 2005).

In the mid-1980s, the government began offering offshore registration to companies wishing to incorporate in the islands, and incorporation fees now generate substantial revenues. The recent (2004) Hurricane (Ivan) that hit the Cayman Islands has boosted this sector of the BVI economy. While roughly 400,000 companies were on the offshore registry by the end of 2000, the number by 2006 had surpassed 500,000. The adoption of a comprehensive insurance law in late 1994, which provides a blanket of confidentiality with regulated statutory gateways for investigation of

criminal offences, made the British Virgin Islands even more attractive to international business.

This economic boom has led to challenges in part because many BV Islanders, particularly young adults and especially males lacking opportunities for full-time employment, habitually work in the USVI and elsewhere (Dookhan, 1975; Lowenthal, 1972). This has at times limited economic development, while relieving population pressure, but at the present time the BVI economy is quite dependent upon "down islanders" – people who are from other islands in the Caribbean (or Guyana) and who come to work in the BVI because it offers better prospects than their homelands. Despite this influx from elsewhere, there is only a 1.9% unemployment rate in the BVI,[8] which gives little flexibility to the economy. The down islanders thus constitute "guest workers" as part of a typical international labour movement – similar to that of the USVI.

In total, over half of the BVI residents are "expatriates" (expats). Some of these are "white expats", who can be divided into those who are employed as senior executives in businesses such as banks, hotels and trust companies as well as those who are retired – termed by one author "up-islanders" (Bowen, 1976). Most though are "black expats" – down islanders, who work principally in construction, trades or the service industries (and particularly tourism) and are mostly on relatively short-term renewable work permits. Their presence is critical for both the construction and tourism industries. They earn relatively low wages, and rebate much of this money to their families 'back home'. There are a number of contentious issues related to the black expatriates – who as "non-belongers" are not allowed to vote, are probably less affluent (they have been accused in the past of "living in slums" (Bowen, 1976: 80)), and have cultural and sub-cultural differences from "belongers" – BVI islanders. In addition, down islanders are sometimes accused (along with some visitors from St. Thomas) of being responsible for an increase in crime rates (Bowen 1976: 80). These circumstances have led to a "strong sense of disaffection" (Cohen, 1995: 413) for many of the non-citizen down islander residents, and at the same time a sense of superiority on the part of belongers (Cohen, 1995). The white expatriates (the "up-islanders") are socially and economically different, and their smaller numbers makes them less of a political issue.

Contemporary Tourism

At the end of the 1960s, the tourist industry was "still remarkably undeveloped" (Bowen, 1976: 77), with few hotels and few hotel rooms. But

change was coming as hotels began to be built, and since 1976, tourism has been the leading sector of the economy (Cohen, 1995: 5). The Islands' current Premier (as of August 2007) is also Minister of Tourism.[9] As his predecessor who also held both positions pointed out, tourism "generates tens of millions of dollars every single year" which "allows us to fund our schools, build our hospital, pave our roads and provide all the other social services that our people depend upon" (*The BVI Standpoint*, 2006c). The tourism industry is related to, directly or indirectly, much of the previous discussion, but in addition there are several key aspects to the present-day BVI tourism industry that need further elucidation. First, tourism is clearly part of the political economy of the BVI, with the government being the major agent of tourist development, and as such the industry is very much tied to government intervention. One aim is to provide benefits for the tourists and the Islanders, and develop a sustainable tourist industry. Another is to address the challenges presented by the industry that have caused problems elsewhere in the Caribbean. Thus the past Chief Minister was recently quoted as saying "My government made a clear commitment, early in our term of office, to managing this important sector so that it can continue to grow and benefit all the people of our territory. And that is what we have done" (*The BVI Beacon*, 2006b). The new VIP government has echoed this statement in its election manifesto (Virgin Islands Party, 2007: 8-9).

In a speech focusing on tourism and commending the BVI Tourist Board, the past Chief Minister promoted tourism as "one of the pillars of our Territory's economy" which is "the largest source of revenue" and "the source of jobs for many of our local people" (*The BVI Standpoint*, 2006c). The BVI Tourist Board, the face of tourism promotion in the Islands and overseas (it has offices in a number of foreign locations such as New York and Mayfair, in London) is an arm's length organ of the government with a mandate to promote tourism of all varieties for the BVI.[10] In addition, and in spite of the enormous increase in the number of "visitors" in recent years, and the increase in facilities constructed for these visitors, the BVI tourist industry still tries to sell the islands as pristine and unspoiled with its slogan "Nature's Little Secrets", and claims to be trying to protect the islands from environmental threats (Trotman: 2006). The government says it is attempting to strike "the right balance between development and environmental protection", and "rejecting the kind of out-of-control development that has turned other places into environmental disaster areas" (*The BVI Standpoint*, 2006c). Once again it is clear that the BVI have gained breathing space and an ability to learn from the mistakes of others, because of their late start in the tourist industry.

In general tourism in the BVI can be divided into three kinds of tourism, land-based, water-based, and cruise ships. All, of course, are closely tied to the climate, and all are, to a greater or lesser extent seasonal. Land-based tourism is characterised by expatriates in privately-owned or rented housing, many of whom are permanent residents[11] but a considerable number of whom are snowbirds – coming for up to six months a year to escape the more severe winters to the north. The major source countries for these 'expats' are the USA and Canada, but there are also some from the UK and other parts of Europe. High land prices and high building costs mean that this part of the industry is necessarily 'upscale' in its nature. In addition to expat housing there are a few resorts and other hotels for short-term visitors – although there are surprisingly few of these in the BVI relative to the tourist population as a whole. The ones that do exist, however, "by fiat of the BVI government" have been designed to blend into and complement the landscape" (Lett, 1983: 37). These resorts also tend to be expensive, are often listed in 'top ten' lists, and mean that tourists that frequent these resorts are also generally affluent.

Land-based tourism has a number of different facets, in addition to the housing of snowbirds and expats in long-term rental or owned accommodation. Housing is not cheap, with prices ranging from a low of US$500,000 up into the millions of dollars, and while the purchase process is straightforward in theory,[12] in practice it is not quick and simple and for a non-belonger can take months or even years.

Guest house/villa capacity has more than doubled in the past decade, although the total (rising from 237 to 497 units) is still quite a small number when overall arrivals are considered. Hotel room capacity has also grown in the last ten years, but only by about 15% (by 165 to 1331, from 1994 to 2004), with hotel visitors only contributing 29% of the total of 'Overnight Visitors'.[13]

Recently there have been a series of proposals for major capital investments that may help to swing the balance of the tourism industry back towards land-based activities. These include a major resort, marina and (the BVI's first) golf course development on Beef Island, a resort and marina on Scrub Island, and a resort at Smugglers' Cove. Although all are still in the planning stages, and still the subject of some controversy (Abuhaydar, 2006), if constructed they will help to strengthen the tourist product of the BVI, boost the number of upscale visitors, boost the economy, and to quote past Chief Minister Orlando Smith "make the BVI more attractive as an upscale destination" (Boring, 2005). It is interesting that a major segment of the opposition to these developments is centred around environmental concerns (water, sewage etc.), indicating a new maturity with respect to this 'smokestack industry' that was lacking in

earlier years in the USVI, and arguably in the BVI as well. In the short term, however, the construction of these resorts is likely to exacerbate the shortage of labour and increase the pressure on the in-migration of 'down islanders'.

With the BVI often characterised as the premier Caribbean location for both sailing and powerboats (<*http://www.bareboatsbvi.com/*>), water-based tourism has been more important than land-based tourism in recent years – although employing fewer Islanders than land-based tourism. As an index of this, Charter Boat visitors made up 54% of overnight visitors in 2004 (with an average of over 50% since 1998). Water-based tourism has four major aspects. First are private and rental ("bareboat") yachts – Charter Boats with the first yacht chartering company, "The Moorings" opening on Tortola in 1969 (Cohen, 1995; *The Charter Connection*, 2006). The BVI has long been a centre for "bareboat" yachting where experienced sailors rent a yacht without a captain and cruise independently.[14] Although yachting is important throughout the BVI, Jost Van Dyke (population 244 and named after a Dutch planter/pirate) is particularly important in this context, and it is reputedly one of the top ten New Year's Eve destinations for the water tourism fraternity. The Soggy Dollar Bar on White Bay, the site of a major New Year's Eve celebration, won an award as the Best Caribbean Waterfront Bar in 2006, from *All At Sea' - "Britain's Waterfront Newspaper*" (*Limin' Times*, 2006).

Second is diving/snorkelling. There are many interesting dive sites around the BVI, largely related to shipwrecks such as the famous "Rhone" site, just offshore from Salt Island. Many of these shipwrecks are 'natural' but many arouse visions of pirate activity. As Scheiner and Scheiner suggest:

> "Wherever there is water there are shipwrecks. Human incompetence, war and the tempestuous nature of the sea have taken their toll for millennia. Mention Caribbean shipwrecks to most people and fantasies of Spanish doubloons and pirate treasure fill their minds - gold bars piled high and strings of jewels overflowing wooden treasure chests " (Scheiner and Scheiner, 1966).

The dive/snorkeling industry has become one of the major players within BVI tourism, and its success is likely to increase.

Third there is fishing, with BVI being acknowledged as having some of the finest sports-fishing opportunities in the world, particularly around Anegada,[15] which is the second largest island in the BVI although it only has a population of 250. It is a low-lying coral atoll (the name derives from 'drowned' in Spanish), its highest elevation being about nine metres above

sea level. It is very popular for water vacations, in part because of the large number of shipwrecks that have taken place in its waters (Scheiner and Scheiner, 1996), and in part because of its potential for fishing (Bronstein, 2006).

Fourth there are cruise ships. The latter are assuming increasing importance and are were heavily boosted by the previous administration (defeated in August 2007). The 'big three' cruise companies, Carnival, Royal Caribbean International, and Princess all dock in Roadtown, as do Holland America, Norwegian, Cunard and others. All of these are, of course, non-Caribbean; they tend to employ non-Caribbean crews, and use non-Caribbean foods, drinks, and services.

Cruise shipping is, however, increasing in importance in the BVI at a much faster rate than other forms of tourism. Although nowhere near as important as in the US Virgin Islands (which is second only to the Bahamas in total cruise ship passenger arrivals, and commonly hosts three or four cruise ships a day, six or seven days a week 'in season'), an increasing dependence upon these ships can be seen.[16] From 2003-2004, cruise ship tourism posted a 56% increase in numbers, compared to a 21% growth of overnight visitors (*The BVI Standpoint*, 2005). In 2004 57% of the total number of visitors to the BVI were cruise ship tourists (*BVI Tourist Board*, 2005). Although there was a slight dip in numbers in 2005 (due to a regional drop in bookings) 449,152 passengers arrived in the BVI. North America still accounts for most of the cruise shippers, but this is likely to change as other markets mature, and this aspect of the industry becomes more globalised. Cruise ships are, however, more than other types of tourism, becoming increasingly controversial. Data on these issues can be hard to find, although information concerned with economic factors is easier to obtain than that concerned with social and ecological impacts (City of St. John's, 2004).[17] However, these problems have been recognised, and the current Virgin Islands Party (VIP) government (elected in August 2007) made it clear in its election manifesto that impact studies will be a priority for the new administration (Virgin Islands Party, 2007). This party has also made it clear, however, that the economic benefits of tourism need to be more widely spread (to 'trickle down' more) than it perceives to have been the case in the past (Virgin Islands Party, 2007: 9).

There are a number of 'generally agreed' areas of contention, as the infrastructure and the environment of the BVI are being increasingly stretched by tourism in general and the cruise ships in particular. First the cruise ships mean an increased number of people in a relatively confined area (mostly the land in Roadtown), and a greatly increased amount of traffic (on roads and on beaches). Roads can be severely congested on cruise ship days and the Cruise Ship Dock in Road Town is unsuitable for

the largest ships (such as the Queen Mary 2) when passengers are anchored offshore and 'lightered' in to the shore. The economies of scale of the industry suggest that these larger ships will become more common, perhaps leading to a call for new facilities (National Democratic Party, 2007). For instance, Cane Garden Bay has traditionally been the "cruise ship beach", but as the number of cruise ship passengers has increased, Brewer's Bay has been opened up to them, and Brandywine Bay is now being prepared as a cruise ship passenger destination with new washrooms, bohios (for shade) and a restaurant, as well as a semi-artificial beach (made of dredged sand).

In an attempt to maintain its 'character' and its sightlines, building heights in Roadtown are restricted to a six-storey limit. As elsewhere on Tortola, level land is at a premium, and a significant part of the newer development in Roadtown, including the Cruise Ship Dock, is on the 'reclaimed land' of Wickham's Cay 1 and 2, which was the "first comprehensive urban development to take place in the islands" (Bowen, 1976: 76). However, parking has become an increasing problem, as has traffic generation and congestion. Although these can be cited as illustrations of economic development, they lead to challenges for both the local populace and the tourists, and if solutions cannot be found might limit the growth of some sectors of the tourist industry. In theory, the number of cruise ships per day (which generate a lot of vehicular traffic (taxis, safari buses and rental vehicles) in Roadtown as well as elsewhere on Tortola) is limited, but in practice this has not always worked out – although the situation is nowhere near as bad as on St. Thomas (USVI) (O'Neill, 1972).

Second, there is debate over the amount of income generated by cruise ships, and its disposition. For instance there is a lot of 'leakage' of spending (out of the Islands) by cruise ship passengers, especially on 'foreign' duty free goods; there is considerable debate about who benefits from government spending on port and shopping facilities, and security expenses; and there is a suggestion that more crime and other social problems are generated by the influx of passengers (*Lighthouse Foundation*, 2006). In addition the number of local jobs created by cruise tourism might be quite low (Hall and Page, 2002: 298), and although cruise day visitors make an economic contribution to the economy, they spend substantially less than stopover tourists (*Lighthouse Foundation*, 2006).

Third, there are also ecological questions related to environmental pollution, centred on the dumping of unregulated or inadequately regulated cruise ship waste – which has traditionally been the focus of most concern (*Lighthouse Foundation*, 2006). The newly elected VIP government made much of environmental issues in its election campaign and its manifesto

emphasises the importance of "environmental sustainability", "carrying capacity", and "eco-tourism" (Virgin Islands Party, 2007: 8).

Fourth, there has been an issue about island services for the cruise tourists keeping up with the demand. Where attempts have been made to keep up with the demands of these visitors, with "Safari Buses" and "Cyber Cafes" becoming increasingly common, further negative impacts on the Islands' infrastructure are cited. In part to counter these criticisms, various solutions to traffic congestion are being "actively" sought, such as peripheral parking lots (coupled with shuttles) and new by-pass roads (*The BVI Standpoint*, 2006a). Infrastructure development was stressed by the successful VIP party in its election manifesto (Virgin Islands Party, 2007: 8).

For the most part, cruise ships are recent enough in the BVI that data cited in response to these contentions is based upon external experiences, such as the USVI. These are not necessarily applicable to the BVI, and the negative views are not shared by everyone. The outgoing National Democratic Party (NDP) Chief Minister/Minister of Tourism Orlando Smith has been quoted as saying that:

> "This government is of the view that cruise tourism is an important sector which contributes to the territory's economy. That is why this government, through the BVI Tourist Board, is working to ensure that this sector is properly managed" (*The BVI Beacon*, 2006a).

However the incoming VIP government in its election manifesto was more skeptical, and stated that in the future "levels of cruise activity (will be) based upon environmental carrying capacity and corresponding levels of infrastructure development" (Virgin Islands Party, 2007: 8). The obvious implication was that the VIP did not believe that this was presently the *status quo*.

Conclusion

As Hall and Page (2002: 29) suggest, tourism in general is a complex phenomenon with substantial economic, sociocultural, environmental, and political impacts. As has been demonstrated in this paper this is certainly the case for the BVI where physical and historical geographies of the territory have been taken advantage of by the tourist industry, and where the impacts of tourist development are debated and discussed on a daily basis. Chasing smokestacks has become common terminology for the actions of towns, villages, regions, and countries wanting instant

development (Black and Chandra, 1996). The contemporary smokestack for many is tourism - ironically stereo typified by the large smoke-stacked cruise ships often visiting places such as Tortola. However, although mass tourist cruise ships are only one part of the BVI tourist puzzle, they are important both financially and symbolically. However, as the new VIP government states, "a sensible balance" between the cruise ship and other tourism sectors needs to be ensured (Virgin Islands Party, 2007: 7).

The BVI are also aiming for 'upscale tourists' (yachts, diving) as well as 'snowbirds' and 'expats'.[17] The recently ousted National Democratic (NDP) government termed this "Platinum Plus" tourism (National Democratic Party 2007: 14). Many of the former stay on yachts both owned and rented. The latter typically live in large, expensive homes that are helping to keep the construction industry at full stretch. The increasing importance of the other major contemporary "earner", the financial sector, is not directly related to this research, but is indirectly connected. It will bring more money to the BVI as well as enhance the territory's 'up market' image, which will inevitably help to boost tourism. It is also argued that the upscale tourism will boost the image of the islands and thus boost the financial services sector. A nice symbiosis if it works. It is argued in this paper that the late start for tourism in the BVI (compared to for instance the USVI, or Jamaica) has allowed the territory critical breathing space within which to evaluate exactly what it wants from the industry. The data currently available indicate that this time has been put to good use, and that the BVI has tried to carve its own tourism niche as an unspoiled tourist paradise, as articulated in the BVI media:

> "The British Virgin Islands remains an undeveloped haven for natural treasures. The BVI boasts no high-rise hotels, no casinos and no crowds, rather the purity of the land – from pristine beaches with powdery sand and crystal clear waters home to an aquarium of the world's most diverse sea life, to extensive coral reefs responsible for claiming renowned shipwrecks and vast outbacks sheltering endangered species" (*The BVI Standpoint*, 2006b).

Although debate continues on the value of the cruise ship industry to the island, the orientation of BVI tourism toward the more 'upscale niche market' end of the industry augurs well for both the economy and the environment. If some of the associated social challenges can be alleviated, there is every chance that the tourist industry in the BVI will prove successful, by any measure. In its election manifesto, the VIP party boosted tourism, as mentioned above, but also stressed the importance of "increasing the economic yield per visitor and spreading its economic

benefits to a wider segment of the community" (Virgin Islands Party, 2007: 9). Although it is unclear how the now-ruling VIP will achieve these aims, the recognition of these challenges has to be seen as a good first step.

In concluding his study of the USVI, O'Neill (1972: 213) stated that "(t) he world beyond the encircling reefs has always threatened the Virgins. Today what happens to the Virgins threatens, by implication and in fact, the world." It is hoped that the lessons of the USVI have been learned, and that tourism and the BVI will be united in a happier union.

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Endnotes

[1]The other UK Overseas Territories are: Anguilla, Bermuda, Cayman Islands, Falkland Islands, Gibraltar, Montserrat, St Helena and Dependencies, British Antarctic Territory, British Indian Ocean Territory, Pitcairn Islands, South Georgia and the South Sandwich Islands, the Sovereign Base Areas of Akrotili and Dhekelia, and the Turks and Caicos Islands.

[2]A third group of islands is located just east of themain island of Puerto Rico and they are part of the Puerto Rican territory (http://en.wikipedia.org/wiki/Puerto_Rico) They are politically and culturally distinct from the Territory of the Virgin Islands of the United States, and are often not labeled as part of Virgin Islands archipelago. However, the term "Spanish Virgin Islands" is common in Puerto Rican tourist literature (e.g. http://www.spanishvirginislands.com/).

[3]Some believe that the Virgin Islands were named by Sir Francis Drake after Queen Elizabeth I of England, the "Virgin Queen" (Dookhan, I.1975: x-xi).

[4]The other islands have a combined population of 86, with 96 people living on their boats, not allocated to an island (Development Planning Unit, 2006).

[5]Population data were supplied to the author by the Development Planning Unit of the BVI government in 2006.

[6]Interestingly, out-migration of USVI islanders was and is common for similar reasons, and the BVI migrants are often seen as necessary replacements for a lack of local workers in (particularly) St. Thomas.

[7]Unfortunately sources of comparable 'wealth' data for all nations are hard to find. The estimate used in this paper comes from the 2004 CIA World Factbook (https://www.cia.gov/cia/publications/factbook/index.html). This source shows the GDP at Purchasing Power Parity Per Capita (GDP PPP) for the USVI as $14,500, for Belize as $6,800, and for Trinidad and Tobagoas $16,700. Bermuda has the highest GDP PPP in the world at $69,900 (2004 est.) according to this Factbook. The GDP PPP per capita for Canada is $34,000 and for the USA is $42,000.

[8]By comparison the UK (one of the "healthiest" economies in Europe) has a rate of 5.4%, the USA, 4.4% and France, 8.8% (Grose, 2006).

[9]An election in 2007 led to a change in government. At the same time a constitutional change came into effect which led to the title of the Chief Minister being 'upgraded' to Premier.

[11]In many cases these residents do regard the BVI as their permanent residence – their permanent resting place as it were, but a considerable number see it as a place that might be home for only a few years, and thus as one part of a more comprehensive retirement plan.

[12]The important of the housing market to the BVI can be seen in part by the existence of the BVI Property Guide, a free magazine that lists properties and contains articles clarifying property buying issues, that is produced within the BVI

[13]Most overnight visitors stay on charter boats (53.7%) with some in rented accommodation (9.3%), some staying with friends (7.8%) and a few in their own or in friends' accommodation (about .08%).

[14]The importance of yachting to the BVI can be seen in part by the existence of the BVI Yacht Guide, a free magazine promoting yachting that is produced within the BVI (by the same publisher as the BVI Property Guide.

[15]In addition there are opportunities for kayaking, parasailing, windsurfing, kiteboarding and surfing.

[16]The important of the cruise ship industry to the BVI can be seen in part by the existence of the BVI Welcome Cruise Ship Visitor Guide, a free magazine aimed at 'cruise shippers' that is produced within the BVI (by the same publisher as the BVI Welcome Tourist Guide.

[17]Other criticisms of cruising as a recreational activity, that it is a largely 'placeless' experience on 'pleasure prisons' that are 'cruising to nowhere', will not be discussed in this paper as it does not directly concern the BVI.

[18]The 'old' NDP government had this upscale orientation, and the new VIP government has the same policy (Virgin Islands Party, 2007).

The livelihood improvement and conservation dilemma: knowledge transfer in the Cananéia Oyster Producers' Cooperative in Brazil

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Abstract: Conservation goals have recently been reformulated for threatened ecosystems in various parts of the world. Conforming to such trends, institutional initiatives in the southeast region of Brazil have addressed issues of socio-economic pressures and alarming threats to the remaining mangrove and Atlantic forest. The designation and enforcement of protected areas have required the relocation of local communities that had limited livelihood skills and options to adapt to new settings. The most serious challenge has emerged from deficiency in local capacity to organize, manage, and apply new interventions. Employing a variety of qualitative research methods, including a variety of Rapid Rural Appraisal (RRA) tools, we examined the genesis of the formation of the oyster producers' cooperative, its institutional structures and linkages for interactive knowledge transfer, and their effects upon improvements in livelihood security and biodiversity conservation in Cananéia, São Paulo, Brazil. Our study revealed that the access of local communities to diverse, cross-scale institutions acted as a safety net in an environment characterized by frequent socio-economic and political fluctuations. With links to such a diverse array of institutions, a principal consortium of these entities was vital for maintaining tight links among the resource base, resource users, and all involved institutions. Innovative interventions that encouraged simultaneous reductions in threat to conservation and improved livelihoods were widely adopted and successfully implemented.

Introduction

Concerns about the current accelerated rates of extinction of biodiversity have instigated the pursuits and establishment of protected conservation areas in the tropical world (Brown 2002). Such strict

conservation measures often undermine impoverished local inhabitants who rely heavily on biological resources to sustain their livelihoods (Campbell and Mattila 2003; Koziell 2001). Poverty may even be exacerbated by the establishment of exclusive protected areas since resource use is prevented and inhabitants are forced to seek alternative livelihoods in different locations, often in slums of overcrowded cities with even less opportunities for sustainable livelihood development (Diegues 2002). Displaced inhabitants find it extremely difficult to adapt to newer occupations due to lack of skill and background, and consequently, community empowerment interventions become essential. In this article, community empowerment is viewed as a multi-dimensional social process through which communities collectively gain greater influence and control over determinants of livelihoods and quality of life. In pursuing a significant enhancement of livelihoods, the capacity of the displacees in terms of education, skill, and experience is a crucial element. Special attention is needed to determine the roles and responsibilities of external institutions to build local capacity by diffusing innovation and transferring knowledge suitable for the local context.

Given the complexity and uncertainty of social and environmental systems, developing successful interventions for poverty reduction and biodiversity conservation is difficult. In addressing complexity and uncertainty for development interventions, the potential contributions of knowledge from both scientific and local sources need to be determined. The utility of solely local knowledge may be limited since it was developed under earlier environmental conditions and does not control for externalities that arise from global demands, free market policies, and the local demands of a growing population (Gómez-Pompa and Kaus 1999; Williams 2002). Nevertheless, local knowledge provides detailed, site-specific information, which can lead to failures if overlooked (Drew 2005; Carlberg 2005; Davis and Wagner 2003). The use of solely external scientific knowledge for development interventions often appears to be inappropriate, since local needs are not adequately understood and incorporated, thereby impeding the successful adoption of the intervention (Lado 1998; Clement et al. 2004; Cramb and Culasero 2003). Local priorities, knowledge, and goals can be accommodated through diverse participatory methods (see Slocum 2003). Incorporating local knowledge empowers local communities to pursue their own goals and destiny, and thereby commit to conservation and development goals (Lado 1998; Drew 2005). The success of interventions hence depends on the use of knowledge from both external and local sources.

However, the mere dissemination of information between sources is not enough (Carlberg 2005). Fusion knowledge, which is a knowledge

base developed by a mutual exchange of external scientific and local experiential knowledge, would help adaptation by creating new opportunities in a constantly changing world (Brown 2003; Schusler et al. 2003; Campbell 1998; Agrawal and Gibson 1999). Knowledge from each source needs to be successively nurtured and built upon to generate fusion knowledge. As well, sources of knowledge must be considered on a horizontal platform to achieve transformative learning and thus foster self-critical, independent thinkers, capable of acting on their own values, meanings, and purposes instead of relying uncritically on other people's demands (Mezirow 1997, Taylor 1998). The acquisition of fusion knowledge is not sufficient since resource users must learn how to use the knowledge to their best advantage (Grabave 1997). However, the generation, acquisition, and use of fusion knowledge is often bound by the socio-economic constraints and social capital of the resource users. Social capital is considered here as a value-oriented cementing force that affects the quality and quantity of other capitals, social order, the patron-client relationship, values, reciprocity, solidarity, collective efforts, empowerment and the socio-cultural identity of a community.

Poor people rarely have the option to access educational opportunities and their resources from schools, universities, the internet, libraries, etc. and they often lack the time, literacy, and technical ability to adequately access new information (Lloyd-Laney 2003). To efficiently exchange knowledge, existing networks can help to channel and exchange new information (Lloyd-Laney 2003). The primary network supplying new information to most poor people is their social network through conversations (Lloyd-Laney 2003). Consequently, face-to-face communication is the best medium to introduce innovative development interventions (Lloyd-Laney 2003). In addition, individuals that are particularly keen on adopting interventions can play key roles for securing greater local-level support (Frahm *et al.* 1996). By demonstrating successful results, the new interventions will spread horizontally to benefit other people.

Introduction to promising development interventions can also be facilitated by nurturing social capital (Pretty and Smith 2005). High social capital is correlated strongly with high levels of economic and social well-being (Pretty 2003). Social capital facilitates cooperation and lowers transaction costs for group efforts. People within a strong social network are more willing to trust each other and work together in collective activities, so less time and resources are needed for monitoring and enforcing individual activities (Pretty 2003).

Efficiency in resource allocation and use is important since financial and technical resources are often very limited (Oliveira 2002, Barret *et al.*

2001, Brown 2003). External resources are of great importance to cover high transaction costs and the building of infrastructure (Rudel 2000), particularly considering that most conservation and development interventions take place in remote areas, and that repeated visits by support staff, the transportation of construction materials, and exporting of products can be rather costly. Consequently, diverse linkages are crucial to channel support from the central government and non-governmental organizations to promising local-level initiatives. Establishing diverse linkages is only the first step; the next step is to find out how to sustain such diverse institutional linkages.

The objectives of this paper are threefold: i) to determine how and where innovation can take place that could be applied to development and conservation interventions; ii) to map cross-scale linkages between institutions and the process of interactive learning; and iii) to determine lessons learned from institutional dynamics regarding conservation and livelihood reconciliation for consideration in future project development.

Study Area and Methodology

Cananéia is located on the southeast coast of Brazil at 25^0S, near the Tropic of Capricorn, and has a regional population of approximately 30,000 (See Figure 1). The region is very important from a biodiversity conservation point of view; it is alarming to note that today there remains only 7% of the initial Atlantic forest, which has the highest concentration of threatened species, and around 50% of the mangroves have been converted to large-scale shrimp farms. Cananéia is presently the poorest and most marginalized region in São Paulo state, primarily because the region is not climatically suitable for large coffee plantations (Bernardo et al. 1993). The unsuitability of the region for large-scale monocultures has led, however, to the conservation of large fragments of highly threatened Atlantic and mangrove forest. The livelihoods of rural inhabitants have historically depended on extracting products for subsistence from the Atlantic and mangrove forests along with shifting agriculture.

The Mandira community is one such community, descended from African slaves, that has pursued livelihoods directly dependent on ecological resources and services since the 18^{th} century. In the 1970s, the rural inhabitants of the region, including the Mandira community, had to change their livelihood means from traditional subsistence agriculture and hunting when the Cananéia region was transformed into an Area for Environmental Protection (Area Proteção Ambiental– APA) by the Brazilian

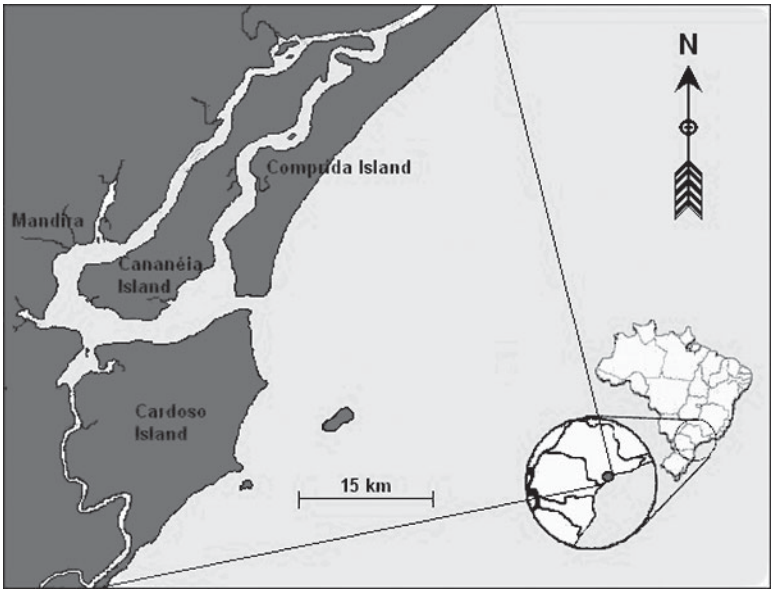

Figure 1: *Map of Cananéia, São Paulo.*

federal government. Banned from farming for the past 30 years, the Mandira community has relied on oyster (*Crassostrea spp.*) harvesting for more than 90% of their livelihood earnings. Initially, economic returns obtained from the oyster harvest were very small. The low economic return obtained from the oysters required the community to overexploit the oyster resource to meet basic needs. Threats to maintaining livelihoods were augmented by the existence of a chain of intermediaries who claimed large portions of the profit. Oyster exploitation was further intensified by outsiders, individuals from neighboring states, who also were usurping the region's mangrove resources. The gathering and preparation of oysters were conducted in secrecy to avoid strict sanitary and harvesting regulations.

Further constraints to consistent income generation stemmed from legal sanctions. Oyster harvesting is banned from December-February, the principle oyster reproductive period. This ecologically important period coincides with the economically important annual peak in oyster demand, as Brazilians head to the coast for summer holidays. Size restrictions also prohibit the harvest if oysters are smaller than five centimeters or larger than ten centimeters. Despite harvest regulations, open access conditions coupled with low economic return resulted in overexploitation and the subsequent decimation of oyster stocks. As a result, the Mandira

community had limited capacity to effectively secure sustainable oyster stocks and livelihoods.

The required fieldwork for this interdisciplinary study was carried out during the period of September 2003–February 2004. A multi-pronged approach with a variety of RRA tools was employed to collect the required data from the Brazilian field sites and secondary sources as these helped for better understanding the communities in different settings. Qualitative approaches were considered more appropriate than using other tools since they assist the understanding of humans in different settings through their social world; such approaches are more responsive than any other known approaches for exploring complex phenomena like rural communities and fisheries that are situated and embedded locally. These qualitative approaches were supplemented by thorough archival reviews, which were carried out at sources available within Brazilian government agencies, such as the Forest Foundation and Fisheries Institute, and at the Nucleus of Support for Research on Populations in Humid Areas in Brazil (NUPAUB; *Núcleo de Apoio à Pesquisa Sobre Populações em Áreas Umidas no Brasil*) in the University of São Paulo.

In light of the objectives of the study, oyster harvesters in the Cananéia region were chosen as the primary respondents. Primary field data were collected through direct interviews using a semi-structured research instrument. A total of 28 active oyster harvesters, most of whom were registered members of the 'Cananéia Oyster Producers' Cooperative' (hereinafter 'cooperative'), were interviewed face to face by the researchers. It was realized that the survey instrument could not cover all elements of the study objectives, and some follow-up interviews were therefore carried out with cooperative members to obtain further information.

Representatives from various organizations involved with the cooperative were considered the next most important responding group. Selected guided questions embodied in a semi-structured survey instrument were used to interview a total of 13 such members. Some follow-up interviews were also conducted with some selected representatives. For example, representatives from the São Paulo Forest Foundation and the São Paulo Fisheries Institute were interviewed regularly, on a weekly basis, to monitor progress in activities and trends.

In order to gather the required technical understanding of oyster aquaculture, the researchers participated in a three-day oyster aquaculture seminar. Further, during their fieldwork, the investigators visited private oyster aquaculture enterprises located in Cananéia and in Santa Catarina state. Along with focused discussions, face-to-face interviews were conducted with the owners of these enterprises during such visits. Participant observation of the complete cycle of oyster harvesting and

aquaculture operations in Cananéia helped the investigators to grasp the potentials and problems with oyster aquaculture and cooperative operations in the region. Additional data on the cooperative structure and functions were collected by attending meetings of the cooperative; the researchers attended nine such meetings. In the cooperative meetings, a wide range of issues were covered, including implementation of an extractive reserve, an appraisal by the Brazilian Fund for Biodiversity, and an urgent need to increase profits for the cooperative. Cooperative members and key organizational representatives were subsequently requested to verify the data collected to date.

Results

Idea for the creation of a cooperative:

Recognizing that biodiversity conservation and the socio-economic well-being of rural inhabitants were both highly threatened by the relocation of local communities and federal legislation for environmental protection, the São Paulo State Secretariat of the Environment sponsored a Coastal Management Program in 1989. The Program conducted an ecological and socio-economic zoning project, which concluded that aquaculture was the only economically important activity with the potential to alleviate poverty and simultaneously preserve environmental quality. With the experience and outcomes of the Coastal Management Program, the Brazilian Center for Sustainable Development of Traditional Communities (CNPT), and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) established a partnership with researchers at the University of São Paulo in 1991. A common goal of creating an extractive reserve in the Coastal Atlantic Rain Forest was established. Local support for the extractive reserve was attained through a multi-faceted approach focused on livelihood improvement. The provision of education, training, and new technologies (rearing beds and depuration station), provided promise to help improve livelihoods without compromising conservation regulations. The focus on attaining livelihood improvement through the establishment of a cooperative and diverse conservation measures greatly facilitated the fostering of local support and long-term commitment.

Researchers from the Forest Foundation of São Paulo assessed several rural communities in Cananéia to determine the socio-ecological viability of implementing an extractive reserve centered on the cooperative. The Mandira community was selected for its relatively richer natural and social reservoirs. The ecosystems neighboring the community have an excellent

degree of ecological integrity and the neighboring mangrove forests yield some of the highest rates of oyster production in the entire region. In addition to natural wealth, strong traditional community and family ties among the Mandira provided a high degree of social capital to help develop well-structured community organizations for the establishment of an extractive reserve and cooperative. The high level of social organization exhibited by the Mandira thus facilitated the formation of the formal organization; the cooperative and other extractors were able to join this previous level of organization. The cooperative was thus formed as a community-based organization centered on the Mandira Extractive Reserve.

Challenges of improving economic well-being and forming the cooperative:

The first attempt to transfer oyster-rearing technology occurred more than 20 years before the formation of the cooperative. In 1974, an oyster aquaculture course was offered by the São Paulo Fisheries Institute and the state organization SUDELPA (São Paulo Coastal Development Organization). Three Mandira community members attended the course, but no major changes occurred after the course due to the lack of both local interest and external initiative. Other oyster-rearing courses were offered by SUDELPA in 1981, and by the non-governmental organization SOS Atlantic Forest, from 1988-1992. Even though these courses were better developed than the initial course offered by SUDELPA in 1974, there was limited success due to the lack of competitive economic return for participants to adopt the new technology.

The SOS Atlantic Forest project distributed 1,200 dozen oyster larvae to six rural families (200 dozen oyster larvae per family). However, only 30% of the oyster larvae reached commercial size for sale within two years, and because of the poor economic returns after two years, the families and their communities did not show further interest in oyster aquaculture (Bernardo et al. 1993). Without securing economic returns, the transfer of oyster aquaculture technology could not gain local acceptance or support.

Government researchers envisioned several interventions to secure greater economic returns for oyster harvesters, such as through the formation of a cooperative, innovative use of rearing beds, procurement of health certification for oysters, and creation of an extractive reserve. With these ideas, the government official began recruiting cooperative members in the early 1990s. It took several meetings to build a relationship based on mutual trust and respect before interactive discussions were able to commence on project development. Nevertheless, scientists from the São Paulo Forest Foundation and Fisheries Institute contacted more than 125 oyster harvesters in and around Cananéia to gauge the quantity

of oysters being harvested in the region, and to gain support for the formation of an oyster producers' cooperative. Local leaders provided vital feedback to government researchers for further iterations of cooperative development. They were also important for mobilizing greater local support from oyster harvesters, who were often skeptical of the benefits of joining a cooperative. During more than 100 meetings, external leaders and local participants worked together to improve organization amongst the oyster harvesters and further develop and test oyster-rearing technology, which culminated in the formation of the Cananéia Oyster Producers' Cooperative in 1997.

Education for local capacity development:

The formation of robust institutions, such as the Cananéia Oyster Producers' Cooperative, requires extensive organizational and personal capacity development, particularly in isolated regions where formal education is extremely limited. Nearly 70% of the cooperative members have less than four years of formal schooling (Garcia 2005). The enhancement of local capacity is therefore vital to enable local communities to effectively network with diverse supporting institutions and compete in competitive markets to secure sustainable livelihoods.

Increasing financial returns to cooperative members and strengthening the organization of the cooperative's initiatives required the assistance of diverse institutions, including marketing organizations, university-based research institutes, and government agencies. Organization for the development of the cooperative was aided by courses that government researchers offered in the early 1990s. During such courses, participants were taught about efficient production methods and organizational management, competitiveness, the unfair share that middlemen claim, and the benefits from belonging to a cooperative, with emphasis on the greater economic returns they might receive by being a cooperative member. In addition to organizational education, the importance of mangrove conservation was also highlighted. Through classroom discussions, participants were exposed to knowledge of human ecological systems, focusing upon the direct links between mangrove conservation, rearing large oysters, and improved livelihoods. These links between a healthy environment and improved well-being were reinforced with the use of clear, concise diagrams such as the jigsaw puzzle depicted in Figure 2. The meetings also engaged them to contemplate the adverse ecological impacts of previously common practices, such as cutting mangrove roots to facilitate harvesting or selling small oysters in de-shelled packs. As an alternative to practices that undermine ecosystem health and sustainability,

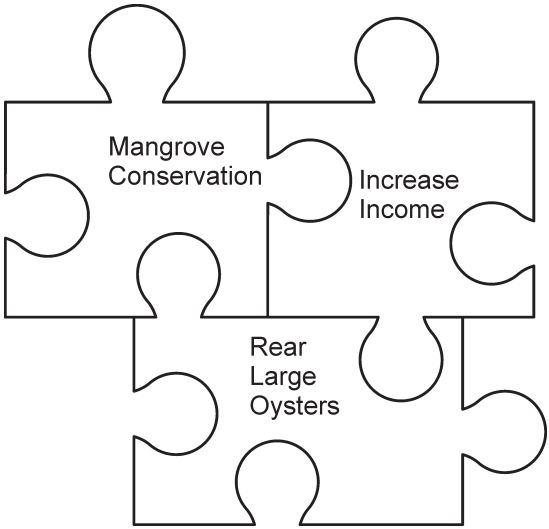

Figure 2: *Interlocking figure used by government researchers to help explain the direct links between mangrove conservation, rearing large oysters, and improved livelihoods.*

participants were encouraged to engage in innovative, socio-economically and environmentally beneficial practices such as using oyster-rearing beds.

Need for interactive learning exchanges:

Rural inhabitants have an intimate knowledge of their surroundings, which can provide important feedback on the quality and quantity of resources (Berkes 1999; Striplen and DeWeerdt 2002). This is particularly important in developing countries, where a lack of resources has prevented benchmark assessments of ecological services and resources. If detailed local knowledge is transmitted to higher-level institutions, which have greater authority and access to larger support networks, the effective mobilization of resources can take place. Higher-level institutions also need to readily accommodate local knowledge in management plans through interactive learning exchange.

Our study revealed that the transfer of knowledge for the development of the cooperative was not strictly top-down. The establishment of relationships of mutual respect provided a platform for interactive dialogue between government researchers and cooperative members. Cooperative members routinely shared their local or experiential knowledge with the government researchers. The government researchers had envisioned the

use of rearing beds to increase yields and economic returns, however, the knowledge of the cooperative members was required to determine the ideal locations for the rearing beds within the estuary.

Another example of successful fusion between external and local knowledge has been the cooperative's adaptation to high oyster mortality from solar heat stress. Cooperative members began to cover oyster beds with palm fronds in the summer to protect the oysters from intense sunlight. Researchers from the Fisheries Institute also suggested mediating heat stress by elevating the top mesh to protect the oysters from rises in temperature. Now both mechanisms are used successfully to mediate heat stress.

Innovative use of rearing beds for development and conservation:

The innovative use of rearing beds was envisioned in very early stages of the cooperative's development. Initially, the oyster-rearing beds were economically inefficient since they were used to raise oyster larvae to market size over a period of two years. However, in the 1990s, economic returns increased as the cooperative members started using oyster beds to rear small oysters harvested from the mangrove to larger sizes. In accordance with the law, oysters larger than five centimeters are harvested from mangrove roots, and then placed and grown in rearing beds for approximately six months. Oysters grown in rearing beds also have greater market appeal since they are grown detached from gnarled mangrove roots and have a uniform appearance. The value of oysters grown in rearing beds is also higher due to their greater physiological resistance, which is induced by the conditioning from the rearing process. Thus, reared oysters have lower mortality rates during depuration and shipment than oysters harvested directly from the mangrove. The use of oyster-rearing beds also enables the cooperative members to sell oysters during the peak tourist season from December to February, when the sale of "wild" oysters is prohibited by law. These direct economic benefits have greatly aided the acceptance and success of the oyster-rearing bed technology transfer.

The rearing beds also have several conservation benefits. The rearing beds allow oysters to reproduce as they attain larger, more profitable sizes, thereby increasing the total oyster reproductive yield and helping replenish the oyster stocks of the region. The use of the rearing beds has helped to prevent the genetic deterioration of the oyster stocks since large oysters are not completely removed from the reproductive population for immediate sale. Large oyster genes may thus persist through successive generations since the selective pressure for large oysters is mitigated, ensuring that remaining reproductive populations will not consist of progressively smaller individuals.

The needed financial support to purchase the materials for the construction of the rearing beds was obtained from external agencies (i.e., university and government sources). Hands-on lessons were given by the Fisheries Institute to participants through demonstrations on how to construct and use the rearing beds to the fullest potential. The transfer of this technology has been realized through an interactive process; local knowledge and experience were specifically sought and used to enhance productivity.

Adding value to oysters through depuration and certification:

Scientists from the Forest Foundation and the Fisheries Institute also envisioned increasing the value of the oysters by obtaining health certification from the Federal Inspection Service (SIF). The scientists recognized that health certification could only be obtained if the oysters underwent depuration. The depuration process consists of exposing clean, live oysters in good condition to purified water. The cooperative currently purifies water through a mechanical filter (80 µm) and a microfilter (25µm), followed by an ultraviolet light filtration system, to sterilize any biota remaining in the purified water. Oysters filter purified water during the depuration process, thus purging impurities within the body and making them safe to eat. By ensuring the oysters are safe for consumption, the cooperative could command higher prices on the market with SIF certification. The cooperative paid around R$ 1.70/dozen oysters, which compared favorably to the average black market price of R$ 0.70/dozen (the Brazilian real had half the value of the Canadian dollar). The annual sale of oysters, with usual peaks between December and April, varied between 15,000 and 35,000 dozen; there was an increasing trend in sales since the inception, with minor declines throughout 2003 and 2004. However, sales were affected by the clandestine selling of oysters by members to middlemen at half the cooperative's price without depuration and SIF certification. Most of the products were consumed by Brazilians and tourists, especially in the summer. However, the present level of sales is not enough to fetch economic self-sufficiency, and the cooperative must find more outlets in national and international markets.

The Federal Inspection Service, which is an institution under the Ministry of Agriculture and Food Supply, requires the analysis of water and oyster samples within the depuration station. Such official analyses are conducted by SIF agents in accredited laboratories a minimum of eight times a year. Microbiological analyses are conducted to detect *Salmonella spp.* and to estimate fecal coliform bacteria and *Vibrio spp.*, which are the pathogens that pose the greatest risks for the consumers of oysters. With

the assurance that the oysters are safe for consumption, SIF certification has been granted.

In accordance with SIF regulations, Fisheries Institute scientists designed the depuration station. Upon the request of the cooperative, land for the construction of the depuration station, along with the cooperative's main office, was donated by the Cananéia municipal government. Financial assistance was obtained from various national and international organizations (See Fig. 3). Nevertheless, national support received from the Brazilian Fund for Biodiversity (FUNBIO) and the Brazilian Ministry of the Environment (MMA) also has international connections since these funds originate from the World Bank.

Funds were procured from diverse institutions (See Figure 3). The Ministry of the Environment, which administers the allocation of various funds, provided funds directly. Additional direct support was provided by World Vision. Indirect funding was obtained with assistance from contacts at the Margaret Mee Botanical Foundation, which helped obtain great financial support from Shell Brazil. Funding for the cooperative was also indirectly secured for the cooperative through the Mandira Extractive Reserve Association and Gaia, a non-governmental organization. It was also difficult for the cooperative to obtain further financial support from the government or non-government organizations since it pursued lucrative endeavors. It was easier for a non-governmental, non-profit organization, such as Gaia, to obtain funding. Gaia along with Mandira Extractive Reserve Association played key roles in the successful application for funds from the Ministry of the Environment (See Figure 3).

In addition to financial support, voluntary work was also important for the construction of the depuration station. The cooperative members provided voluntary manual labour to aid the construction efforts. The completion of the depuration station was only possible with reliance on diverse institutions. However, in the case of the cooperative, reliance on diverse institutions was a very time consuming process. For instance, the proposal to purchase construction materials for the depuration station was drafted in 1995, however, the depuration station only began to operate in December 1999.

Upon completetion of the depuration station, Fisheries Institute scientists also conducted experiments on the length of depuration necessary to reduce fecal coliforms to meet safety regulations and prevent overexposure of oysters to the depuration process. During the depuration process, oysters do not obtain sustenance as they expend energy to filter water and consequently lose strength. If the oysters become very weak, they are predisposed for mortality during the stresses of shipping. To avoid such losses, the minimal duration required to purge impurities and

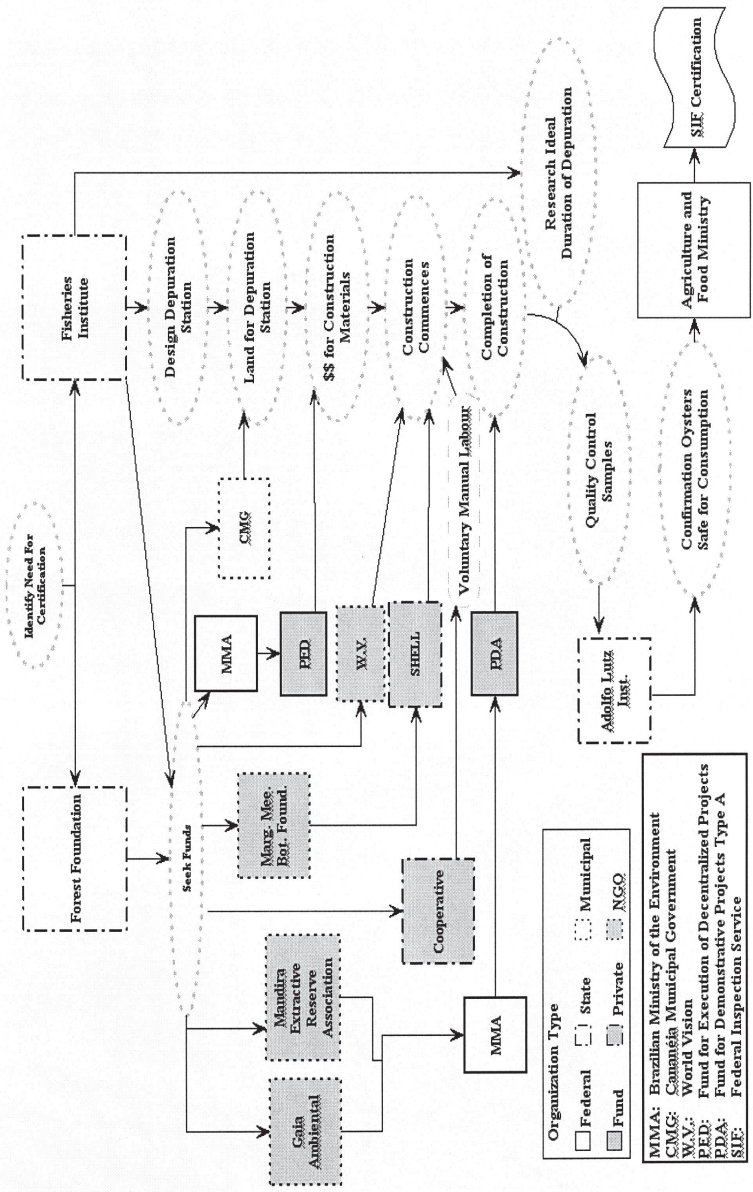

Figure 3: *Institutional cross-scale linkages which enabled Cooperostra to obtain health certification for its oysters.*

pathogens within the oysters needed to be determined to minimize overexposing the oysters to depuration. The ideal depuration time was found to be six hours in research conducted by the Fisheries Institute.

The combined efforts of both the Fisheries Institute and the Forest Foundation were vital for the development and construction of the depuration station. There is no formal written agreement between these two organizations; however, they have developed a very strong and interactive partnership. Both organizations split the work to complete tasks quickly and efficiently.

Discussion: Lessons Learned from the Cooperative

Institutions needed to devise innovative solutions:

The construction and use of oyster-rearing beds and a depuration station have helped secure the economic viability of the cooperative by increasing the value of the oysters, while providing additional employment. However, other value-adding options need further exploration and development. Processing oysters to increase the durability of the oyster product would help with market expansion since live oysters must be delivered within just five days. Oyster processing methods, such as freezing and canning, need to be explored to facilitate the transportation and sale of greater quantities. Oyster aquaculture methods also need further technological refinement to increase total yields and thus total sales. Eco-labeling via the Marine Stewardship Council would also help increase the value obtained by the oysters. Consequently, diverse institutional support is required to better develop these other value-adding options.

The cooperative case evidently showed that the development of innovative solutions is not enough; beneficial technologies and concepts must be efficiently transferred if these new solutions are to succeed. The transmission of these innovative solutions is best achieved by showing how their application has a direct link to greater economic returns. For example, the oyster-rearing bed technology only became widely adopted once its use became economically more efficient. Innovative solutions for simultaneous conservation and development will only succeed if the economic benefits of interventions are easily foreseeable or attainable by the practitioners.

Improving economic return and livelihood improvement is critical for conservation:

Investigations based on case studies with members of the cooperative revealed that the livelihood standard changed significantly; the changes

are reflected by higher enrollment in school-based education, better housing and the purchase of household electronic goods. It is estimated that around 70-80% of the family income came from the cooperative activities. The earnings were estimated around R$900 (Brazilian reals, around half a Canadian dollar per real) after the formation of the cooperative, which was around 3-4 times higher than the pre-cooperative stage income. The Forest Foundation, the Fisheries Institute, and the University of São Paulo helped cooperative members of Mandira obtain political voice and legal rights to their resource, by assisting with the designation of the Mandira Extractive Reserve. The cooperative is also currently working with the Brazilian environmental agency, the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), to ensure the active enforcement of resource-use laws within the reserve, primarily to prevent outsiders from claiming resources within the reserve. Even though the project members might be granted rights and active control of the resource, they are not yet fully economically sound to commit to long-term conservation goals.

Enhancing the financial return for the cooperative and its members has been the primary challenge for the continued success of the cooperative. The cooperative would benefit considerably from a greater demand for cooperative oysters and increased sales. For instance, such augmented demand would help prevent cooperative members from being forced to sell oysters to middlemen, which undermines the cooperative's own market. The cooperative is not currently capable of selling all the oysters its members produce, so members still sell to middlemen to supplement their incomes. Cooperative members also sell their product to middlemen to maintain ties with them in case the cooperative fails. To overcome these constraints, the cooperative would need to have access to expanding markets throughout Brazil and outside its national border. However, suitable methods for market expansion are unknown or currently not economically viable.

Project members need consistent organizational support to secure economic futures, since securing rights and active control over resources is necessary but not sufficient for sustainability. For example, rubber tappers in Amazonian extractive reserves are empowered with rights and control to their resource but are still at the mercy of highly fluctuating international rubber prices (Brown 2002). To keep conservation goals as an option and to attain them successfully, basic needs must always be sufficiently met. Consistent organizational support is necessary to assist with value-adding efforts and marketing to help secure economic viability.

Moreover, the role of middlemen as active members of the community and as distributors is often overlooked in narrowly focused attempts to

quickly increase wages for project/community members. Middlemen possess knowledge and valuable contacts with local markets that could be harnessed to help with the marketing initiatives. Middlemen could be trained to up-sell (i.e., convince current clients to buy certified oysters for health reasons) and thus assist in establishing and maintaining linkages with market networks. With some training and the provision of materials such as pamphlets, middlemen could help educate their client network on health risks associated with eating uncertified, non-depurated oysters. Mechanisms involving necessary regulatory interventions need to be set in place to ensure that middlemen are not usurping an unfair proportion of the profits.

Diverse institutions act as a safety net:

Attempts to integrate biodiversity conservation with poverty alleviation require extensive and diverse institution building (Kellert et al. 2000). New institutions for conservation and development must be adaptable, capable of managing complex ecosystems, and accommodate diverse stakeholder interests, and these institutions must work across various spatial, social, and organizational scales (Brown 2003).

Cross-scale linkages to diverse institutions have been fundamental for building the capacity of the cooperative to construct the depuration station (See Figure 3 and Table 1). Access to diverse institutions, just as with access to high levels of biodiversity, confers resilience. The diverse institutions act as a safety net or web that helps the cooperative better adapt to socio-economic changes. This safety web of institutions is crucial in socio-economic climates of developing countries, such as Brazil, which have relatively frequent fluctuations in political organization and economics. Nevertheless, in more stable environments, it might be more efficient and effective to rely on fewer, more secure organizations.

Horizontal learning key to increase scale and sustainability

The cooperative members and local community have benefited from cross-scale learning. Initially started in Mandira, the oyster rearing process then spread horizontally to individuals of neighboring communities, with the Mandira participants demonstrating the key techniques. If the cooperative could increase its sales and increase the enrollment of cooperative members, horizontal learning would then be the key to train new individuals from other neighboring communities, which also have access to bountiful oyster stocks. Horizontal learning was also crucial in

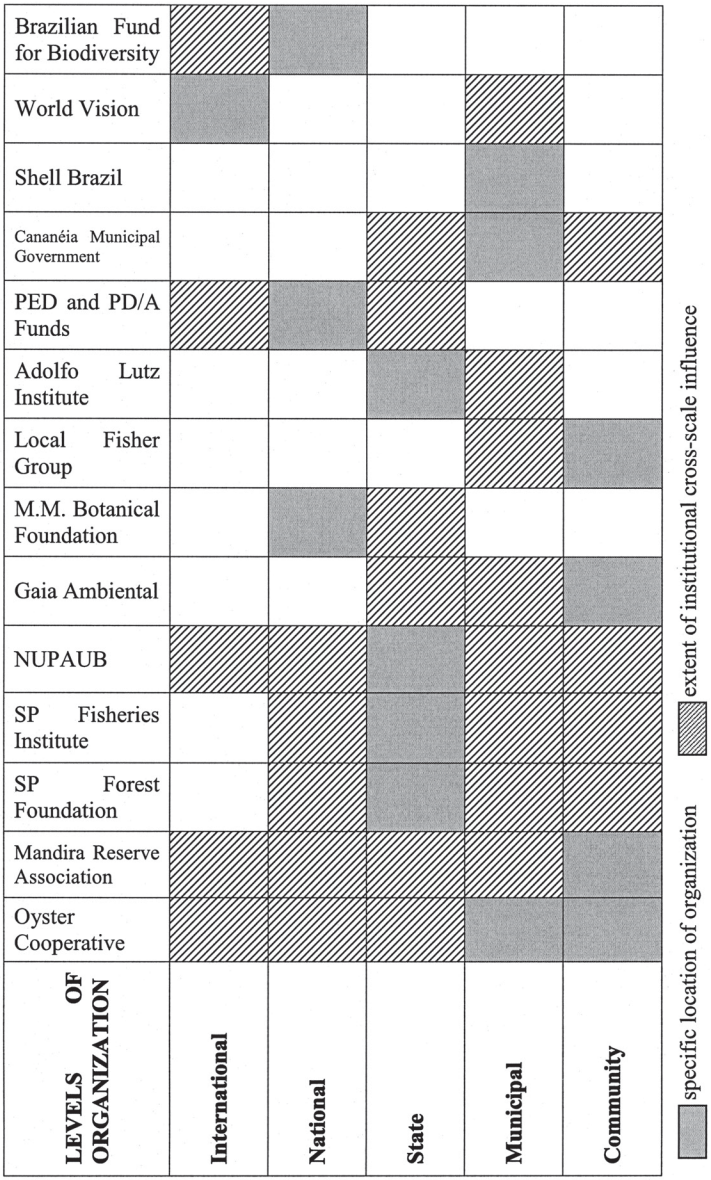

Table 1: *Cross-scale connections; names and levels of organizations linked to the Cananéia Oyster Producers' Cooperative.*

the creation of the Mandira Extractive Reserve, since people living within Amazonian extractive reserves were brought in by IBAMA to help the Mandira residents draft regulations for the extractive reserve. As stated above, the women of the community were also inspired by the organization to start their own seamstresses' cooperative, *Corte Costura*.

Vertical learning, with open exchange between external experts and local participants, is important for transferring new, potentially beneficial technology as well as indigenous knowledge for integrated conservation and development projects. However, horizontal learning is no less an important aspect for the reconciliation of development with conservation goals. Horizontal learning, i.e. learning from one's neighbor, may actually be more beneficial than vertical learning since a common language is used and a more realistic or practical approach is taught. Furthermore, horizontal learning facilitates acceptance and empowerment by demonstrating that individuals under similar situations are capable of learning and using new technologies.

Conclusions

This case of the cooperative has revealed that successful development interventions to conserve biological resources must incorporate strategies for creating employment and enhancing income. Ecological sustainability is attainable with extractive reserves but the challenge remains with securing organizational and livelihood sustainability; external support is indispensable for training local communities**.** Development interventions would only succeed by understanding the participants' resource needs, preferences, and socio-economic circumstances and constraints (Lado 1998).

Innovation to add value to oyster production and sales for reducing pressure on the mangrove ecosystem required the involvement of an array of concerned, external institutions. Various well-coordinated endeavors, such as the adoption of oyster-rearing beds, a depuration station, education, and the designation of an extractive reserve, have enabled cooperative members to earn greater economic returns for their oyster resource while reducing the enviornmental impact and harvesting smaller quantities of oysters. The implementation of the cooperative's diverse endeavors now enables cooperative members to earn higher wages by harvesting less (Garcia 2005), thereby successfully reconciling development and conservation goals. The adoption of local knowledge through interactive learning processes was key to the successful implementation of these

measures. Such a favorable resolution was made possible with the assistance of diverse, cross-scale insitutions. The cooperative members have realized the economic and ecological benefits of selling larger oysters and the importance of preserving mangroves to maintain oyster stocks. An informal assessment of the oyster stocks by cooperative members suggests that oyster stocks have increased greatly. Further improvement of oyster stocks could be achieved through enhancing research on how to successfully link local scale enterprises to larger, potential global markets and enhance their revenues. The subsequent effects of establishing such market connections also need exploration to further enhance best practices to reconcile biodiversity conservation and poverty alleviation.

The successful adoption of innovation can significantly build and enhance local organizational and management capacity; additionally, it can function as a catalyst for further initiatives. The success of the cooperative set an example that helped the women of the Mandira community to organize themselves to create a 'Seamstresses' Cooperative' (*Corte Costura*), which produces and sells clothing and handicrafts. The Mandira community members are also currently organizing themselves to capitalize on ecotourism within their region. Consequently, the success of the cooperative has empowered the community, both psychologically and technically, to seek further development opportunities in accordance with conservation regulations.

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Determining the effectiveness of remote sensing for studying boreal forest response to moisture stress

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Abstract: This study examines the effect of moisture stress on northern Saskatchewan's forests, and determines if this impact can be monitored with the use of remote sensing imagery. Meteorological data from northern Saskatchewan over three years were analyzed to determine if there were any temperature and precipitation anomalies in this area. Change detection analyses were performed on satellite images acquired in 1997, 1998, and 1999 by the NOAA AVHRR and Landsat-5 TM sensors. The results from these analyses were then examined using several statistical tests to determine if the differences were significant.
Analysis of the climate record showed that 1998 was warmer and drier than normal. The satellite image analyses highlighted large reductions in vegetation growth in this year. We also found statistically significant differences in vegetation productivity within the study area from 1997 to 1999. We conclude that the northern Saskatchewan forests undergo climate-induced stresses large enough to be detected by spaceborne sensors during periods of fluctuation in temperature and precipitation.

Introduction

Remote sensing can provide us with a large amount of information about any location on earth, regardless of how harsh the climate, or isolated the area. In particular, monitoring the effects of changing climates on the Earth's vegetation with remote sensing has given us new insights to the impacts of global warming (Lillesand et al., 2004). Remote sensing systems

with a near-infrared band, such as Landsat's Thematic Mapper (TM) sensor and NOAA's Advanced Very High Resolution Radiometer (AVHRR) sensor, are ideal for studying climatic impacts on vegetation productivity as healthy green vegetation reflects strongly in this part of the spectrum.

The purpose of this study was to determine if remotely sensed data can be used to document an effect on anthropogenically undisturbed vegetation in northern Saskatchewan that could be attributable to a reduction in moisture levels, similar to what would occur during an El Niño event. Our work was based on the hypothesis that fluctuations in moisture levels in 1997 and 1998 would create a change in vegetation productivity that was strong enough to be detectable by remote sensing.

The objectives of this study were:

1) To document temperature and precipitation anomalies over a three-year period: 1997, 1998 and 1999.
2) To determine if these anomalies had an impact on forest productivity that was large enough to be observable in remote sensing imagery.

Drought and Climate Variability in the Boreal Forest

A reduction in moisture levels in a boreal forest ecosystem results in a reduction of vegetation productivity. This ecosystem is sensitive to climatic fluctuations. Drought is identified as a major factor affecting the health of various tree species, such as trembling aspen, in the boreal forests of the Canadian prairie provinces (Brandt et al., 2006). Long-term dendrochronology studies show that over time, drought has had a significant effect on boreal forest health in Canada (Bergeron et al., 2002). Lower precipitation levels result in reduced forest productivity.

Temperature also has an effect on forest health. Initially, an increase in temperature will result in an increase in photosynthetic activity (Kellomaki and Vaisanen, 1997). However, this temperature increase will also result in an increase in soil temperature, which will eventually cause a reduction in soil moisture, therefore decreasing vegetation productivity (Kellomaki and Vaisanen).

El Niño

El Niño is a meteorological event whose effects are felt in many areas throughout the globe. It is a change in weather patterns over the Pacific Ocean, which results in a reverse in the east-west flow of ocean currents

(UNEP, 1992). This change is connected to many other changes in weather patterns in areas far beyond the Pacific Ocean (D'Aleo and Grube, 2002).

In the 1970s scientists realized that there was a connection between El Niño and world weather patterns (UNEP, 1992). These relationships between the El Niño phenomenon and other weather patterns throughout the world are called *teleconnections*. Anomalous weather associated with an El Niño event is not restricted to equatorial regions. Teleconnections - atmospheric pressure and circulation anomalies that extend between global circulation patterns – bring El Niño-related weather changes to disparate regions of the Earth. For example, scientists have noted reductions in hurricane frequency in the western Atlantic with concomitant increases in Southeast Asia during an El Niño event (UNEP, 1992). Floods and droughts can bring famine and disease, especially to developing countries that have limited coping capacities. Changes in weather can disrupt the balance of ecosystems causing the death of animals, reduce soil quality due to wind and water erosion, lower crop yields, and disrupt transportation and communication networks (UNEP, 1992).

In the 1920s, Sir Gilbert Walker suggested that El Niño may have an effect on western Canada. Although this idea was originally rejected, it has since been shown that El Niño is correlated with dryness and drought in western Canada and the northwestern and north central United States (Garnet et al., 1998; D'Aleo and Grube, 2002). Ropelewski and Halpert (1986) found that the Pacific northwestern United States, western Canada and Alaska experienced warmer than normal temperatures in eighty-one percent of El Niño years. Bonsal and Lawford (1999) looked at the years 1948 to 1991 and concluded that there were more extended dry spells in the prairies following the mature stage of an El Niño event. D'Aleo and Grube (1992) attributed this to a teleconnection change in the Pacific-North American Oscillation where a high pressure ridge develops over northwestern Canada and a low pressure trough sets up over the southeastern United States. This pattern creates dry conditions in areas under the ridge, and heavy precipitation downstream of the low pressure trough. During an El Niño winter the jet stream is usually split over western North America. In this situation, most of the energy runs through the southern part of the flow. This split results in warmer and drier weather in western and central Canada. This suggests that El Niño could have a direct effect on the growth and productivity of vegetation in northern Saskatchewan.

1997/98 El Niño:

A particularly strong El Niño occurred in the winter of 1997-98. Sea surface temperature anomalies in the Pacific Ocean were larger than those

seen during most El Niño events. The effects of this El Niño were devastating to many nations. It has been estimated that this "Super El Niño" killed 2,100 people and caused $33 billion (US) in damage (D'Aleo and Grube, 2002). The El Niño was a significant contributor to the 1998 ice storm that left millions of people in eastern Canada without power for weeks.

Remote Sensing

Much of northern Saskatchewan is sparsely populated and vegetation maps of this area are not routinely updated. Remote sensing is a valuable tool for studying changes in remote areas and can provide timely data that would otherwise not be available.

Landsat Thematic Mapper:

In the 1960s, NASA began a program whose purpose was to launch a series of earth observing satellites (Lillesand et al., 2004). The first of these satellites was put into orbit on July 23, 1972, and was called ERTS-1 (Earth Resources Technology Satellite - 1), later to be renamed as Landsat 1 (Lillesand et al., 2004). To date, there have been six successful Landsat satellites: Landsat 1-5, and Landsat 7.

In this study, data from Landsat 5 were used since this was the only Landsat system operational from 1997 to 1999. This satellite was launched on March 1, 1984 and is still in orbit. Its primary sensor is called the Thematic Mapper (TM), which records seven spectral bands of data (in the blue, green, red, near IR, mid IR, thermal IR and mid IR spectral regions) and it has a 30 meter spatial resolution (Lillesand et al., 2004).

There are many applications for Landsat data, including classifications of land use, map updating, urban growth monitoring, recognition of rock types, glacial monitoring, tracing sediment patterns, and vegetation monitoring (Jensen, 2000).

NOAA AVHRR:

The U.S. National Oceanic and Atmospheric Administration (NOAA) has several satellites in orbit that were originally designed to aid in weather prediction. These satellites, however, have also proven to be very useful in the monitoring of natural resources because they provide a high temporal resolution over a large area (Lillesand et al., 2004). In particular the NOAA -6 through NOAA -17 satellites have all carried the Advanced Very High Resolution Radiometer (AVHRR) sensor. The AVHRR records data in five bands: visible red, near infrared and three thermal infrared, and has a

nominal spatial resolution of 1.1 km at nadir. AVHRR data have been used for snow cover mapping, flood monitoring, soil moisture analysis and vegetation mapping (Lillesand et al., 2004).

Vegetation Monitoring with Remote Sensing:

The spectral reflectance characteristics of vegetation facilitate the monitoring of vegetation cover and productivity. Radiation in the red part of the visible electromagnetic spectrum is absorbed by plant pigments, while near-infrared radiation is strongly reflected (Ustin, 2004). The ratio of these two wavelengths is related to the photosynthetic activity of the plants and responds to changes in their chlorophyll contents and green biomass (Jensen, 2000).

Vegetation indices - the ratio of the red and near-infrared data from remote sensing instruments - have been developed to determine the relative abundance and state of vegetation in an area. Of the more than twenty vegetation indices that have been developed, the most robust is the Normalized Difference Vegetation Index (NDVI) (Ustin, 2004). The NDVI is a measure of vegetative quality and vigor (photosynthetic activity) (CCRS, 2005). The NDVI is calculated as:

NDVI = (Near IR – Red) / (Near IR + Red)
Where:
Near IR - near-infrared sensor band (e.g. TM 4 or AVHRR 2)
Red - red sensor band (e.g. TM 3 or AVHRR 1)

NDVI values range from -1 to +1. Features such as cloud, water and snow reflect more in the visible part of the spectrum than they do in near-infrared wavelengths so they usually have negative NDVI values. Bare soil or rock typically have NDVI values of around zero. Healthy green vegetation has stronger near-infrared reflectance than red thereby producing NDVI values close to +1 (Lillesand et al., 2004).

The NDVI can be used for many types of vegetation monitoring, such as forest clear cutting, biomass estimation, and deriving approximations of photosynthetically active radiation (Aronoff, 2005). In particular, changes in annual NDVI measurements of vegetation taken over the same region can be related to differences in growing conditions and has been successfully applied for studying vegetation responses to climate change (Ustin, 2004). There is, however, a lack of information on the use of remote sensing for monitoring the effects of El Niño on sensitive boreal environments, such as northern Saskatchewan forests.

Study Area

We examined the sensitivity of the northern Saskatchewan boreal forest to climate at two scales. The "overall" study area extends from 55º N to 60° N and from 104°W to 108º W (Figure 1). The AVHRR data cover the overall study area (Figure 2a). The majority of the vegetation in the study area is Northern Boreal Forest with a small portion of the southwest corner covered by Southern Boreal Forest (University of Saskatchewan, 1999). Black spruce and jack pines are the most common tree types in the Northern Forest, although some birch is also present. The Southern Boreal Forest has many different vegetation types, such as poplar, spruce and alder (University of Saskatchewan, 1999).

A southern section of the overall study area was selected for more detailed analysis with TM data. The "detailed" study area is bounded by 54° 59' 18" N, 104° 35' 40"W (southeast corner) and 56° 48' 11"N, 106° 35' 05"W (northwest corner) (Figures 1 and 2b). Due to persistent cloud cover in some years, a smaller Landsat subarea was chosen within the detailed area to minimize cloud contamination (Figures 1 and 2c). The detailed study area includes many lakes and rivers, such as Upper and Lower Foster Lake, Foster River, a portion of Smooth Stone River, Besnard Lake, Daly Lake and the Morin Lake Indian Reserve. This is a highly vegetated area that contains a large amount of forest with some marshy sections. The area was chosen because it is sparsely populated and the vegetation here is relatively undisturbed.

Data

Remote Sensing Data:

In order to study the effects of the El Niño we acquired data that were collected before, during, and after the event. For the overall study area AVHRR images were obtained from 1997, 1998, and 1999. For each year, two AVHRR images were acquired: one from near the beginning of the growing season (June 1) and one from the end (September 1). The AVHRR images are cloud-free NDVI composites that include only the best data from a 10-day window around the image date.

Landsat TM images were acquired for the detailed study area from the summer months of 1997, 1998 and 1999. Summer images were selected because that is the time of maximum vegetation productivity. Every effort was made to obtain images that were acquired as close to the same date as possible in order to accurately compare vegetation. In spite of this, there was some variance in the image dates due to persistent cloud cover in

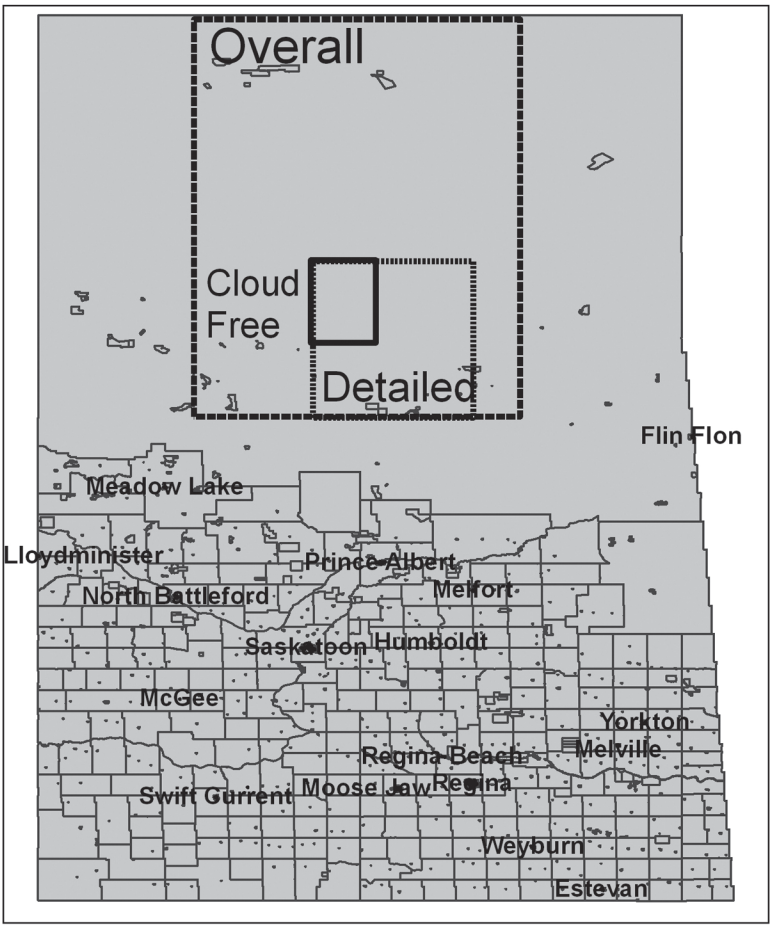


Figure 1: *Study areas.*

some years. The first image was acquired on September 1, 1997, the second on September 20, 1998 and the third on July 7, 1999.

Cloud-free subareas from the TM images were taken along the western edge of the scene in order to maximize the cloud-free coverage between dates as much as possible.

Climate Data:

Climate data were retrieved for the La Ronge weather station (55° 09'N, 105° 16' W), which is the closest weather station to the detailed study area with available data. The data included the average temperature

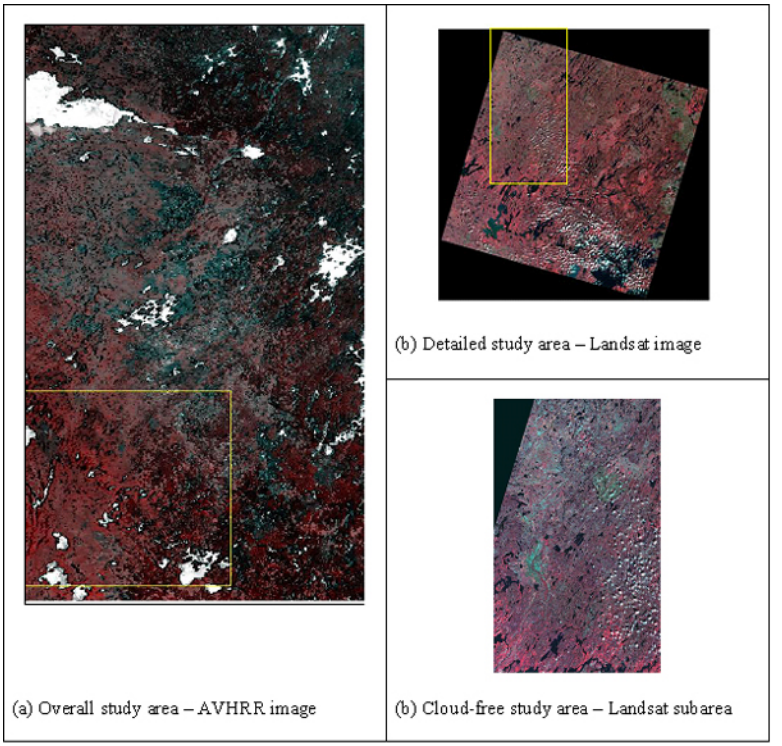


Figure 2: *Satellite images of the study areas.*

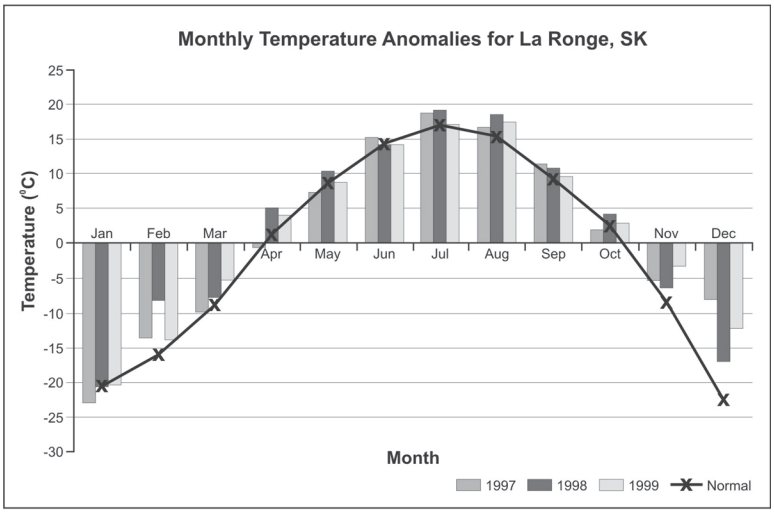
and total precipitation for each month in 1997, 1998, and 1999 (Figure 3). For comparison purposes the 1961-1990 climate normal for these parameters was also obtained.

Analysis Procedure

Our first objective was to determine if there were temperature and precipitation extremes contemporaneous with the 1997/1998 El Niño event. To answer this question we computed monthly anomalies for the three years studied by calculating the differences between the monthly values and the long-term normal. These are plotted in Figure 3.

In order to determine if these climate anomalies had an impact on forest productivity that was large enough to be observable in remote sensing imagery (our second objective), we established a multi-stage

(a)



(b)

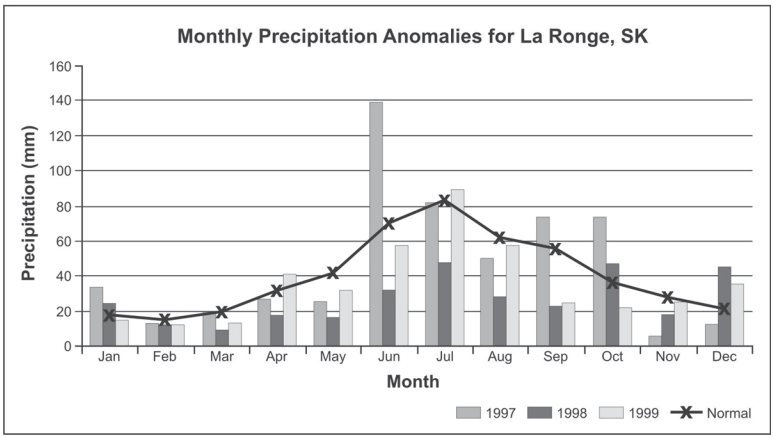


Figure 3: *Temperature and precipitation climate data for La Ronge.*

remote sensing image change analysis procedure that included change composite analysis, image classification, and image differencing. Not every change technique was applicable to both the TM and AVHRR data. In particular, we could only create image change composites and image classifications from the TM data because our AVHRR images were lacking their original spectral bands (since we obtained them as NDVI composites).

The first step in any change analysis is to co-register the images so that the data can be compared on a pixel-by-pixel basis. We did not have to process the AVHRR images since they had been previously co-registered by NOAA. The three TM images were registered to one another using ground control points. The overall RMS registration error was 0.16 pixels (approximately 5m on the ground).

Change Composite Analysis:

Once all three images were registered, visual analyses were performed using the change composite method outlined by Howarth and Boasson (1983). This method relies on colour mixing theory to highlight areas of change between two images. It is applied by displaying an image band from the first date in red and the corresponding image band from the second date in both blue and green. In the resulting colour composite image areas that appear red had a stronger spectral reflectance on the first date than on the second. Cyan (blue-green) areas, however, had a stronger reflectance on the second date. Those areas experiencing little change between the two dates will be displayed in shades of grey.

We applied the change composite method to the near-infrared (TM 4) bands from the Landsat sensor since this band has the strongest vegetation signal. We did not use the technique on the AVHRR data because we didn't have the near-infrared data from this sensor.

Image Classification:

All three Landsat TM images were classified individually, and a post classification change analysis was performed, following the method described by Lunetta and Elvidge (1998). In this method, images from different dates are classified and labeled independently from one another, and the results of the independent classifications are then compared. This allows changes in classes to be detected. The disadvantage to this method is that it relies on the accuracy of each classification. An unsupervised classification was used because little was known about the type of vegetation in the area. The images were classified using a K-means algorithm was used with a maximum of seven classes.

We did not attempt to classify the AVHRR data because we didn't have the original spectral data from this sensor.

Image Differencing:

The third change analysis method we implemented was image differencing. We applied this procedure to the AVHRR NDVI data by subtracting one image from another on a pixel-by-pixel basis. The procedure creates a new image that represents the change in pixel values

between the two data sets (Lunetta and Elvidge, 1998). The difference images were colour-coded to show areas of increase in vegetation productivity in red, and areas of decrease in cyan. Grey was used to represent areas of little or no change.

We wanted to examine the broader spatial and temporal context beyond the extents of the Landsat TM imagery so we only applied image differencing to the NOAA AVHRR data.

Results

Analysis of Climate Data:

Figure 3 highlights the temperature and precipitation anomalies – those values that differ from the long-term normal – for the three-year period from 1997 to 1999. The normal annual temperature at La Ronge is -0.1C (Environment Canada, 2005). The temperature data show that while all three years were warmer than normal, 1998 was the warmest in the three-year period. The average annual temperature at La Ronge peaked in 1998 at 1.9C, while it was 1.6C in 1999 and only 1.0C in 1997.

The year 1998 was also drier than the other years. The total precipitation for 1997 was 557mm and 426mm for 1999 while the total for 1998 was only 321mm. Normal precipitation amounts are 349 mm (Environment Canada, 2005).

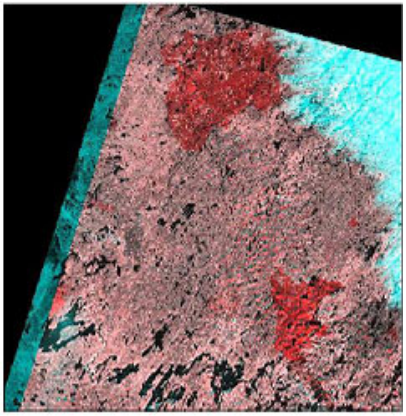
These data show that there was a difference in meteorological conditions in 1997, 1998 and 1999, with 1998 being warmer and drier than normal. This agrees with the findings of Ropelewski and Halpert (1986), D'Aleo and Grube (1992) and Garnet et al. (1998) discussed earlier, which also suggest that an El Niño event is correlated with warmer and drier conditions in Saskatchewan.

Change Composite Analysis:

We applied the change composite method to the near-infrared (TM 4) bands from the Landsat sensor since this band has the strongest vegetation signal. We evaluated colour composites between 1997 and 1998 (Figure 4a), and 1998 and 1999 (Figure 4b).

Red dominates the image tones in the 1997-1998 composite indicating a decrease in near-infrared reflectance between these years. We interpret this as a decrease in vegetation productivity in 1988.

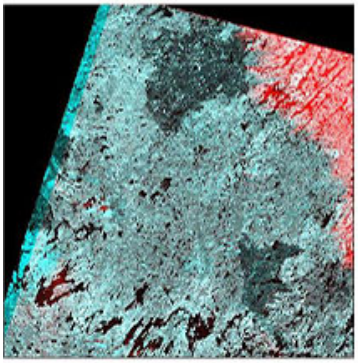
The two very large bright red areas are the scars of recent fires. The Canadian Forest Service forest fire data shows that there were two large forest fires in the study area in 1998 (Canadian Forest Service, 2005). Both fires burned before the 1998 Landsat image was acquired (September 20).



(a)

1997 vs 1998

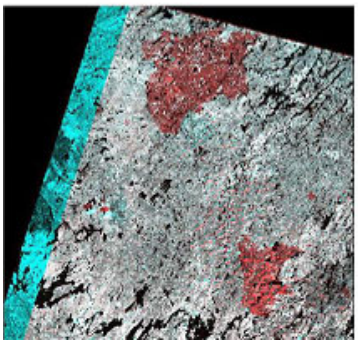
1997 (red) and 1998 (green &blue)



(b)

1998 vs 1999

1998 (red) and 1999 (green &blue)



(c)

1997 vs 1999

1997 (red) and 1999 (green &blue)

Figure 4: *Change composite images.*

One fire was located at 56° 49'N and 106°36'W, which corresponds with the fire scar in the northern portion of the images. This fire was started on August 4, 1998 and its final size was 120,000 hectares. Another fire was located at 55°44'N and 105°45W, which corresponds with the fire scar in the centre of the image. This fire was started on July 8, 1998, and its final size was 36,400 hectares.

Many of the water bodies visible in the change image are ringed with cyan suggesting a vegetation increase in 1998. A review of the precipitation data for 1997 (Figure 3b) shows a large rainfall anomaly in June. This suggests that the 1997 flooding, and 1998 re-emergence, of lake-fringe riparian areas.

There is an overall cyan tone in the 1998-1999 change composite indicating a general increase in near-infrared reflectance across the scene in the second year. We interpret this as an increase in vegetation productivity in 1999. The bright red area in the northeast quadrant of the scene is a by-product of cloud cover in 1998. The 1997-1999 change composite is dominated by grey tones (except for the fire burn scars) suggesting that the vegetation productivity was about the same in both these years.

The change composite analyses between the three years highlights 1998 as a period of a marked reduction in vegetation productivity.

Image Classification:

The three Landsat TM images were individually classified using an unsupervised k-means algorithm and labels were interactively assigned to the resulting classes. The classification is summarized in Table 1 with the individual classified images shown in Figure 5.

Table 1: *Unsupervised classification summary.*

	1997		1998		1999	
Classes	**# of pixels**	**% of image**	**# of pixels**	**% of image**	**# of pixels**	**% of image**
Image Edge	5306580	21.23	7180696	28.73	7192753	28.77
Water	3319287	13.28	2900496	11.60	3055086	12.22
Healthy Green Vegetation	7253646	29.01	4573224	18.30	4871150	19.48
Green Vegetation	5130747	20.52	6288946	25.16	5918370	23.67
Dry Vegetation	1244944	4.98	1977405	7.91	2426598	9.70
Bare Land	2422230	9.69	283220	1.13	1441315	5.76
Clouds	322566	1.29	1791013	7.17	99624	0.40

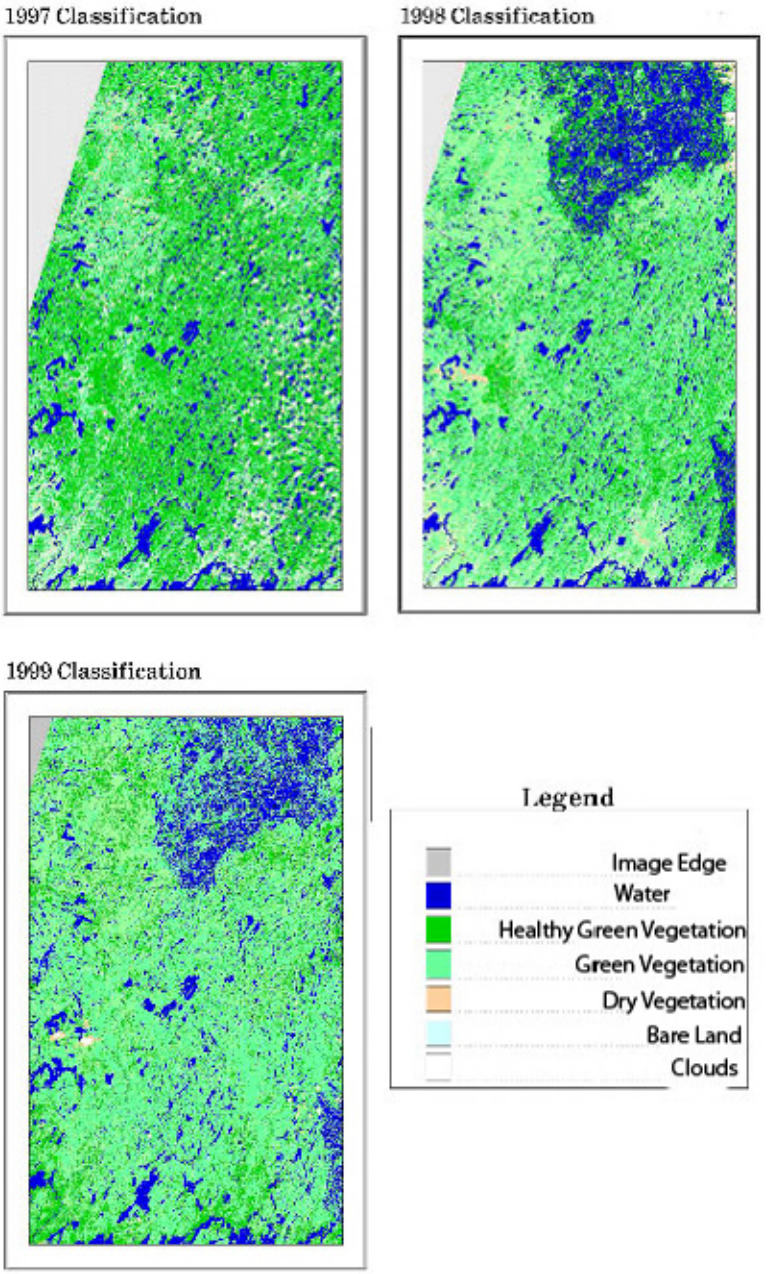


Figure 5: *Classified images.*

The 1998 image had the fewest number of pixels classified as water of all three years. The water percentage in 1997 was 13.28%, which dropped to 11.60% in 1998, and increased again slightly in 1999 to 12.22%. This suggests the presence of a moisture deficit in 1998.

There was a significant reduction in healthy green vegetation from 1997 to 1998 (from 29% to 18%) largely due to the 1998 forest fires. Importantly, this class saw an increase in 1999, thereby isolating 1998 as the year with the lowest percentage of healthy green vegetation.

The dry vegetation class showed a steady increase across all three years, perhaps indicating a "drying out" after the 1997 precipitation anomaly.

An analysis of the remaining classes produced inconsistent results. For example, the bare land class fluctuates significantly over all three years. In 1997 it has a percentage of 9.69%, which drops to 1.13% in 1998, and increases to 5.76% in 1999. This is probably an indication of some of the limitations inherent in the change analysis of classifications, particularly when site specific accuracy assessments are not possible.

Overall, however, there seemed to be drier conditions in 1998 and 1999 than those that were experienced in 1997.

Image differencing:

To examine our observed changes in a broader spatial and temporal context we analyzed the inter-annual differences in the NOAA AVHRR NDVI data. These data cover the overall study area (most of northern Saskatchewan) and represent the vegetation productivity in both early (June 1) and late (September 1) summer. The difference images, shown in Figure 6, were colour coded to show areas with a significant NDVI increase in red, significant decreases in cyan, and areas of little or no change in grey.

Grey tones dominate the difference image for June 1997 to 1998 (Figure 6a) indicating that there was little change between these dates. Notable exceptions are the red areas of NDVI increase near Lake Athabasca in the north and in the Churchill River basin in the south-central section of the image. This was likely due to the warm spring in 1998 (Figure 3a). In contrast, the cyan tones spread across the September difference for the same years reflect significant decreases in vegetation productivity (Figure 6d). The two fire scars that dominated the detailed Landsat TM change composite image (Figure 4a) are clearly visible as deep blue patches in this overall image. The hot, dry summer of 1998 is clearly illustrated by this image.

The effects from the anomalous weather of the summer of 1998 appears to have been carried forward through the spring of 1999 where cyan tones

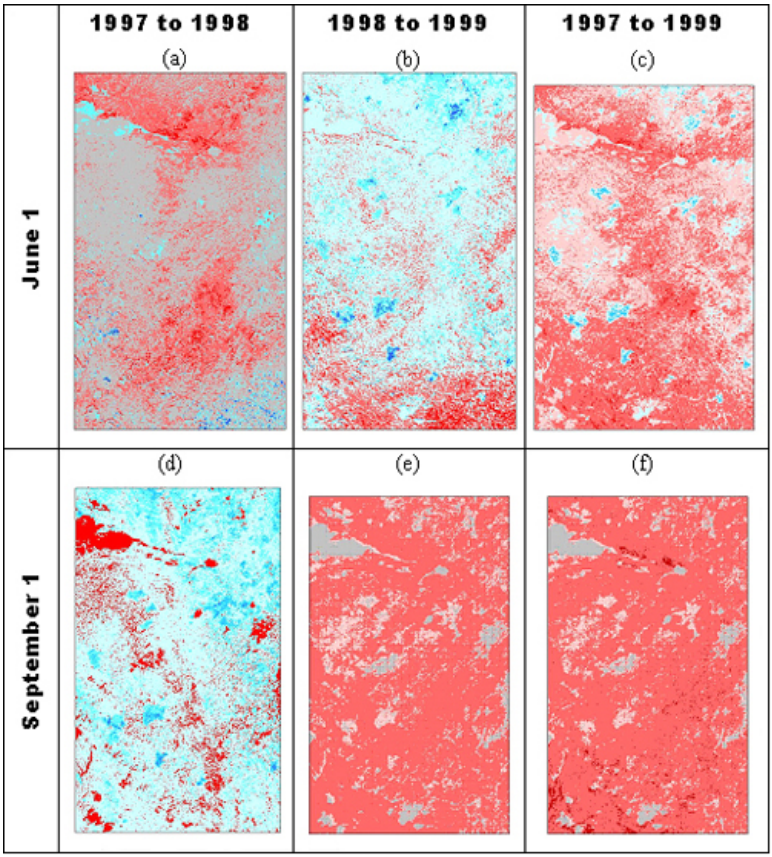


Figure 6: *NDVI image differences for NOAA AVHRR data.*
Red: significant NDVI increase
Cyan: significant NDVI decrease
Grey: no significant change

continue to dominate the June 1998 to 1999 difference image (Figure 6b). Interestingly, this effect is not pronounced in the region of the detailed study area, where we see more of a balance between NDVI increases and decreases. In contrast to the June image, the September 1998 to 1999 difference image documents strong vegetation productivity increases across the entire overall study area (Figure 6e). The summer of 1999 saw a return to near-normal temperature and precipitation (Figure 3) allowing the forests to recover from their climatically-induced stresses of the previous year.

Across the three years there was a general increase in vegetation productivity, particularly in the late summer (Figures 6c and 6f). The scars of burned forests stand out particularly clearly in the June difference image.

Statistical Analysis:

We were interested to know if the observed changes in vegetation productivity between 1997 and 1999 were statistically significant. We used the Kruskal-Wallis test (H) to determine if there were any differences between the AVHRR NDVI values for the month of September in the years 1994, 1997 and 1998, and for the month of June for the years 1994, 1998 and 1999. Our null hypothesis was that there was no difference among the NDVI values for the three years being studied. With two degrees of freedom, the critical value for the test statistic at a confidence interval of 0.05 was 5.99. In both cases our calculated values for H were less than the critical value so the null hypothesis could not be rejected. Therefore, there was not enough evidence to suggest that there is a difference among the measured NDVI values across the years tested.

We also used the Kolmogorov-Smirnov test (D) to determine if there was any difference in the NDVI values by comparing just two years at a time. The test was performed on the years 1997 and 1998, 1998 and 1999 and 1997 and 1999 for both the June and the September data. The null hypothesis for these tests was that there was no difference among the NDVI values for the two years. In all of our tests, the calculated value of D was greater than the critical value, which means that the null hypothesis can be rejected. Thus, there is enough evidence to suggest that the NDVI values are significantly different among the three years. Further, the calculated D value was higher for the September NDVI values, signifying that in September, the differences among NDVI values were more significant. We think that this was a result of higher vegetation productivities in September than in June.

We attribute the different results from the Kruskal-Wallis and Kolmogorov-Smirnov tests to the way in which the years were grouped by each method. Although there was a change from 1997 to 1998 and from 1998 to 1999, the NDVI values for the years 1997 and 1999 were quite similar. For this reason, when comparing all three years using the the Kruskal-Wallis test there was not enough of a difference in the 1997 and 1999 values for the results to be significant. However, when comparing just two years at a time with the Kolmogorov-Smirnov test, significant differences were observed.

When we applied the same statistical analyses to NDVI values calculated from the Landsat TM images we obtained similar results.

Summary and Conclusions

The purpose of this study was to assess the capability of remotely sensed data for identifying impacts on anthropogenically undisturbed vegetation in northern Saskatchewan that could be attributable to fluctuations in temperature and precipitation. We focused our work on:

1) Determine if there were any temperature and precipitation anomalies from 1997 to 1999; and
2) Establish if these anomalies had an impact on forest productivity that was large enough to be observable in remote sensing imagery.

An examination of the meteorological data from 1997, 1998 and 1999 showed that 1998 was an anomalously hot, dry year, particularly during the summer months. The annual average temperature in 1998 was 1.8C warmer than normal and precipitation amounts were 8% lower than the long-term average.

An examination of medium- and small-scale satellite imagery acquired during the summer months of 1997, 1998, and 1999 has also highlighted 1998 as a year of reduced vegetation productivity. Digital change analyses of Landsat TM and NOAA AVHRR images identified strong decreases in near-infrared reflectance in 1998. We conclude that the weather anomalies of 1998 did have an impact on forest productivity. Further support to this conclusion comes from the presence of two prominent burn scars evident in the detailed study area were produced by forest fires ignited in the summer of 1998.

A statistical analysis of the remotely sensed data showed that, while there was no difference among the NDVI values when all three years were compared to one another, there was a significant difference in NDVI values when just two years were compared. We conclude that the changes in forest productivity arising from temperature and precipitation anomalies from 1997 to1999 were large enough to be observable in medium- and small-scale remote sensing imagery.

Acknowledgements

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Applying GIS for assessing wildfire risks to climate change in Saskatchewan

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Abstract: Unprecedented challenges are being placed on Saskatchewan's forest fire management program through expanding forest uses, increasing northern populations, and escalating costs of fire suppression. Previous studies have found a correlation between wildfire frequency and available moisture levels, suggesting that climate plays a significant role in wildfire characteristics. Since the moisture regime of many forested regions has been changing due to global warming it is important to try and understand how climate change could impact the distribution, occurrence, and intensity of wildfires in different regions in the province. Assessing wildfire risks to climate change impacts is a complex and challenging issue, however, since the occurrence and intensity of wildfires are influenced not only by climate, but also by other factors such as vegetation type, topography, and soil condition. In this article we present a wildfire index to examine the potential climate-induced forest wildfire risk changes in northern Saskatchewan. The index is based on three indicators including the density of lightning-caused wildfires under current climate conditions, and expected changes in temperature and precipitation under future climate scenarios. June wildfire data from 1959 to 1999 were used to plot the spatial distribution of fire occurrence under current and future climate scenarios. We found significant shifts in the high wildfire risk regions in northern Saskatchewan.

Key words: wildfire, climate change, risk, forest, Saskatchewan, ArcGIS

Introduction

Wildfire is a natural process that threatens forest values including timber supplies, recreational opportunities and wildlife habitat. Reducing the risk of wildfire is a critical issue for protecting forest resources, minimizing endangered animal losses, and maintaining the sustainability of local forestry-based communities (Prevedel, 1995). The issue is

particularly challenging, however, due to the temporal and spatial complexities of wildfire occurrences. The spatial inventory and analysis capabilities of Geographic Information Systems (GISs) can help derive regional scale descriptions of wildfire configurations (Greer, 1995; Didon et al., 1996).

GIS has become a popular and effective tool for wildfire management (Ambrosia et al., 1998; Pew and Larsen, 2001; Theodore, 2004). For example, the GIS embedded in the Canadian Wildfire Threat Rating System (WTRS) allows resource managers to explore the effect of management actions on the threat of wildfires, the potential impact of those fires on forest resources, and the various options available for reducing the probability of large, intense wildfires (Hawkes and Beck, 1997). The Airborne Wildfire Intelligence System (AWIS) is a commercial and automated system that can provide integrated fire intelligence and higher level decision support products in near real time via GIS and the Internet (Campbell et al., 2002). Further management strategies involving space-time models are continuing to be developed (Yuan, 1994).

Increasing forest uses, growing populations, and the escalating costs of fire suppression are placing unprecedented challenges on Saskatchewan's fire management program (Kafka et al., 2001). Such a situation could be much worse under a changing climate regime since forest wildfires are sustained mainly by soil and tree moisture levels. Thus, weather plays a significant role in a wildfire's characteristics. In general, warmer and drier weather leads to more severe fire behavior. This has already been observed in some regions that are experiencing more intense global warming (Weber and Flannigan, 1997). If trend towards warmer and drier conditions continue into the future – as projected by some climate change scenarios - wildfire risks would be increased.

Saskatchewan's forest resources are particularly vulnerable since they already exist at the margins of climatic suitability (Flannigan et al., 1998). Climatic changes in Saskatchewan might produce one of the largest increases in fire danger in North America and have far-reaching implications on sustainable forest management policies and practices in regions that are already experiencing high recurrence of fire. It is important and urgent for resource and fire managers to have tools to assess fire risk and to assist them in strategic planning and risk mitigation based on current and possible future weather conditions conducive to fire. (Parisien et al., 2004)

In addition to temperature and precipitation, the wildfire regime is governed by topography, forest type, wind, lightning, and other factors. Ideally, all these risk factors need to be considered in order to analyze the potential of wildfire under climate change (Parisien et al., 2005). Some of these factors are interrelated, however, and including them all can produce

less parsimonious models. For example, an increase in atmospheric moisture often leads to more frequent lightning-caused fire ignitions. Further, some factors, such as topography and forest type, can be considered to be constant under changing climate conditions. Yet other factors, such as wind, need to be removed from future wildfire models simply because we do not yet have the capacity to project these conditions into the future. Only temperature and precipitation projections obtained from general circulation models (GCMs) are widely available; future scenarios for most of the other factors are either non-existent or poorly developed.

In this research we investigate the potential impacts of climate change on wildfire risks in the forest covered area of Saskatchewan. Our objective was to determine if the regions of highest wildfire risk could be shifted under a changing climate. The spatial distribution of fire occurrence from 1959 to 1999 was analyzed in conjunction with averaged monthly precipitation and temperature data for the same period. We then employed a climate change scenario to project these data into the 2050s and developed a wildfire index as a tool for assessing the potential risks of fire under climate change for the forest-covered regions of the province.

Study Area

Overview of the Study Area:

This study encompasses all of the Province of Saskatchewan, Canada (Fig. 1). Saskatchewan's environment can be divided into three hierarchical levels, based on the ecological land classification. At the highest level there are four *ecozones* that span the province in broad latitudinal ranges (Agriculture and Agri-Food Canada, 2005). The ecozones are subdivided into eleven *ecoregions* (Fig. 1) and then 157 *landscape areas*. The area and climate conditions of the eleven ecoregions are summarized in Table 1.

The recent Intergovernmental Panel on Climate Change (IPCC) report (Watson et al. 1996) suggests that of all the world's forests, the boreal forest is expected to be the most vulnerable, because warming is expected to be particularly large at high latitudes, and because boreal forests are more strongly affected by temperature than forests in other latitudinal zones (Kirschbaum and Fischlin 1996). Increased forest fire activity is expected to be an early and significant result of a trend toward warmer and drier conditions (Stocks 1993).

Examination of the spatial distribution of all large (>200 hectares) Canadian fires showed that by far the greatest area burned occurred in the boreal region of Saskatchewan (Stocks et al. 2002). They attributed this to a combination of fire-prone ecosystems, extreme fire weather, lightning

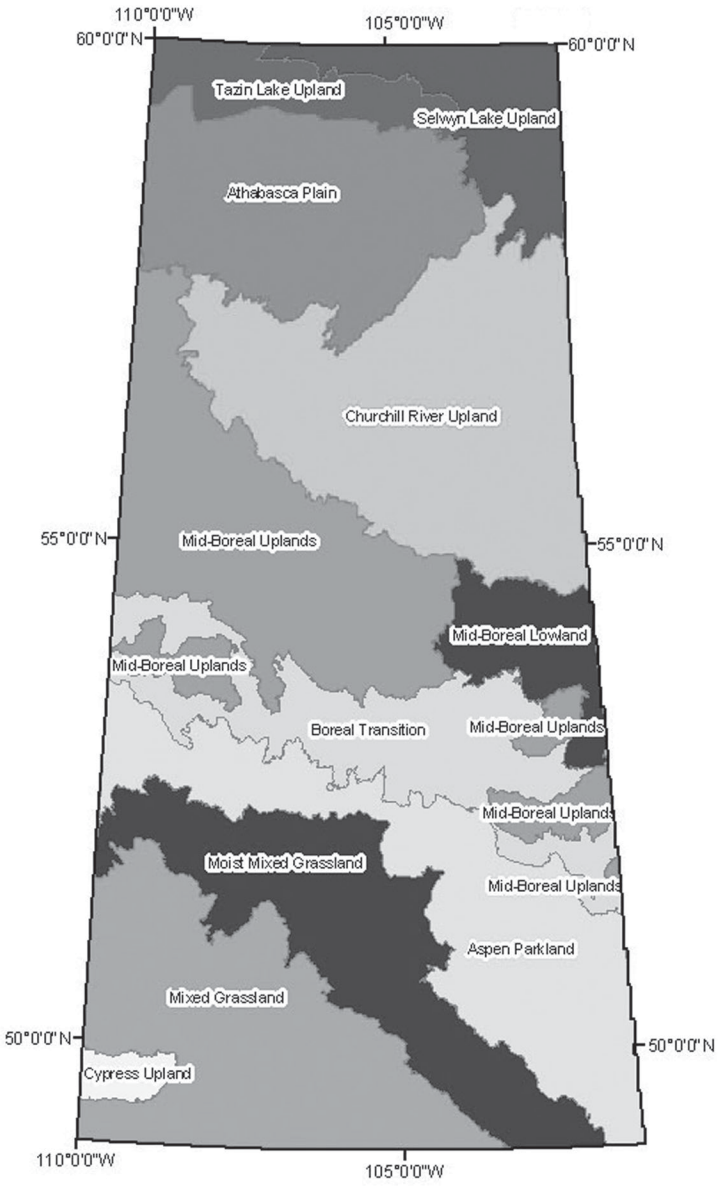

Figure 1: *Map of Saskatchewan ecoregions.*

Table 1: *Area and climate conditions of Saskatchewan ecoregions.*

Ecoregions	Area (km^2)	Total annual precipitation (mm)	Mean July temperature (^0C)	Water deficit (mm)
Selwyn Lake Upland	28,600	262	15.6	---
Tazin Lake Upland	18,060	362	16.2	---
Athabasca Plain	73,980	451	15.8	---
Churchill River Upland	113,110	528	16.0	124
Mid-Boreal Upland	101,500	456	16.3	180
Mid-Boreal Lowland	21,540	452	17.7	169
Boreal Transition	54,030	452	17.4	297
Aspen Parkland	81,570	420	18	332
Moist Mixed Grassland	67,890	380	18.8	425
Mixed Grassland	86,710	352	18.9	524
Cypress Upland	4,860	450	16.0	439

activity, and reduced levels of protection in this region. Globally, the boreal forest stretches in two broad transcontinental bands, generally between 45 and 70 degrees north latitude, across Eurasia and North America. In Saskatchewan, the Boreal Plains and Boreal Shield ecozones encompass seven ecoregions starting with the Boreal Transition in the south and proceeding north to the Selwyn Lake Upland. We analyzed wildfire risk by ecoregion because the consistent vegetation and climate conditions within each region are generally mirrored by consistent wildfire characteristics over the same area.

Data:

Ecoregion boundary files were obtained from Agriculture and Agri-Food Canada as ArcView shapefiles.

Wildfire data were obtained from the Canadian Large Fire Database (LFDB, Canadian Forest Service, 2002). The LFDB is a compilation of all fires greater than 200 ha that have occurred in Canada for the period 1959–1999. The information of each fire include the year, month, day, province, fire ID, latitude, longitude, start date, detect date, cause, size, fire region, fire zone, ecozone, ecoregion, and ecodistrict. Although these data represent only 3% of all fires, they account for more than 97% burned area and can be used for spatial and temporal analyses of landscape-scale fire impacts.

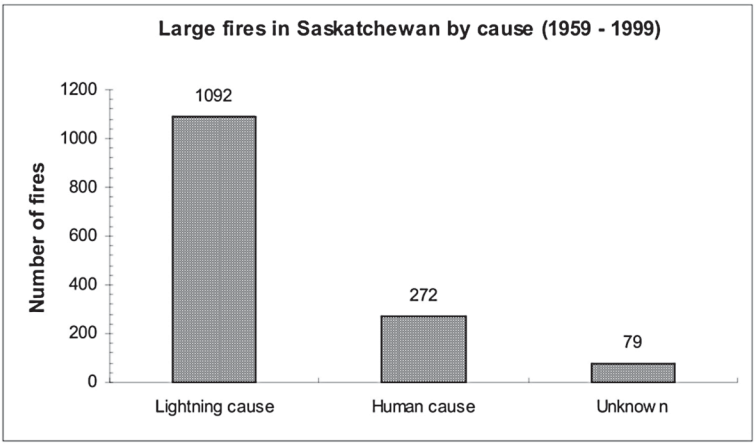

Figure 2: *Large fires in Saskatchewan by cause.*

Wildfires can have natural origins (i.e., lightning) or be caused by human activities. Only those fires caused by lightning were used in this research since they are much more common (Fig. 2) and since their natural origins will make them more sensitive to changes in climate.

Further, since most wildfires in Saskatchewan occur in summer (Fig. 3) and the total number of lightning-caused fires in June increased by decades since 1960s which is likely to correlate with the trend of temperature change decades since 1960s, only data from June were incorporated in our analyses.

The Canadian Ecodistrict Climate Normals 1961-1990 were used to determine present monthly climate conditions (Agriculture and Agri-Food Canada, 1997). This data set includes monthly maximum, minimum, and mean temperatures, and monthly rain, snow, and total precipitation.

Climate projections to 2050 were based on the first generation coupled Canadian General Circulation Model, greenhouse gas with aerosols simulation 1 (CGCMI GA1) developed by the Canadian Institute for Climate Studies (CICS, 2005). Five hundred arc-second grids of monthly values for average maximum temperature and total precipitation were used.

Analysis Methods

Climate Change Wildfire Index:

Assuming the vegetation types within each ecoregion would not change significantly in our analysis timeframe (fifty years), we hypothesized

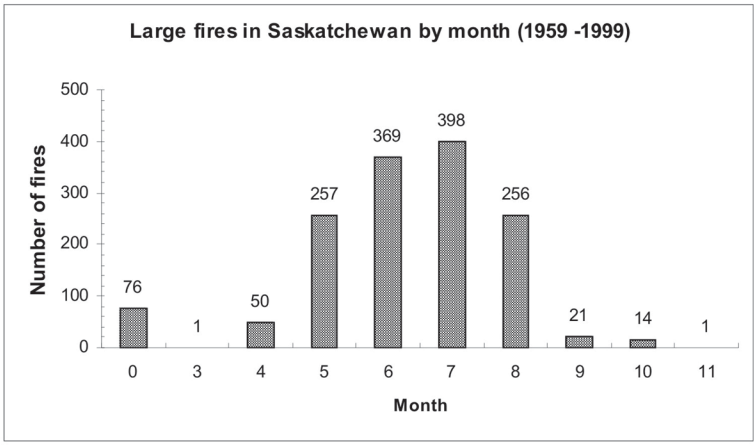

Figure 3: *Large fires in Saskatchewan by month.*

that changes in the wildfire regime arising from climate change could be modelled primarily as a function of temperature and precipitation. Thus, we formulated a *climate change wildfire index* (U) based on temperature and precipitation projection and the propensity to wildfire in a region:

$$U = 0.5*F + 0.3*”T + 0.2*”P$$

Where: U is the index to measure fire regime under climate change, and high value of U means high risks of fire occurrence under the future climate scenario; F is the propensity to fire occurrence under present climate conditions; ”T is the change in averaged monthly maximum temperatures between the current and future climates; and ”P is the change in averaged monthly precipitation between the current and future climates. In order to distinguish the positive and negative relationship for each variable in the equation, we rank ”T and ”P to values from 0 to 10, respectively. The low limit of ”T is assigned as 0 and upper limit of ”T assigned as 10, meanwhile, the low limit of ”P is assigned as 10 and the upper limit of ”P is assigned as 0.

A split sample of the data was used to adjust the model parameters' weighting factors. That is, part of the earlier data were used to project conditions at a later period within the temporal range of the data. These forecasts were then compared to the actual conditions and the parameter weights adjusted accordingly. With manually adjustment, we adopted weights for the fire indicator as 0.5, the temperature indicator as 0.3, and the precipitation indicator as 0.2.

GIS Analysis:

We used ArcGIS V8.3 to assess the present wildfire regime and to apply the climate change wildfire index to future climate scenarios (Fig. 4). First, kriging was used to estimate statistical surfaces of present and future temperature and precipitation data.

These data were then differenced and reclassified to produce projected temperature and precipitation changes.

The spatial distribution of recorded June wildfire occurrences was analyzed through the creation of a density surface. These surfaces were combined through map algebra to compute the climate change wildfire index. The future wildfire risk map was derived from the climate change wildfire index through a reclassification.

Results

Present distribution of wildfire occurrences:

Fig. 5 shows the location, size, and ignition source of all large wildfires that burned in Saskatchewan over the period of 1959-1999. It is clear that most of the lightning-caused fires have occurred in northern Saskatchewan while fires of human origin dominated the south. In terms of quantity, many more fires have burned in the north than in the southern part of the province, likely because of the enhanced fuel supply (i.e., forests) and the remoteness of northern regions.

When we analyzed the distribution of wildfires by ecoregion, we found that the Churchill River Upland had the largest number of fires during the 40-year period (Fig. 6). The number of fires decreases continually as you move north through the Athabasca Plain, Mid-Boreal Uplands, Selwyn Lake Upland, and Tazin Lake Upland. These five ecoregions alone account for 90% of the total fires in Saskatchewan. Since these fires occurred in northern Saskatchewan and since they were mostly started by lightning, we conclude that northern Saskatchewan has the highest risks of wildfire occurrence and focused our subsequent analyses there.

Fig. 7 shows marked increases in wildfire occurrences during the 1980s and 1990s, especially in summer (June to August). In contrast, the percentage of human-caused fires appears to have decreased since the 1960s, especially in May, June (Fig. 8). When taken in combination, we conclude that the number of fires of lightning origin has increased since 1960s. Fig. 8 also shows that most fires of human origin occurred in spring (April) and autumn (October). Since there has been a constant increase in

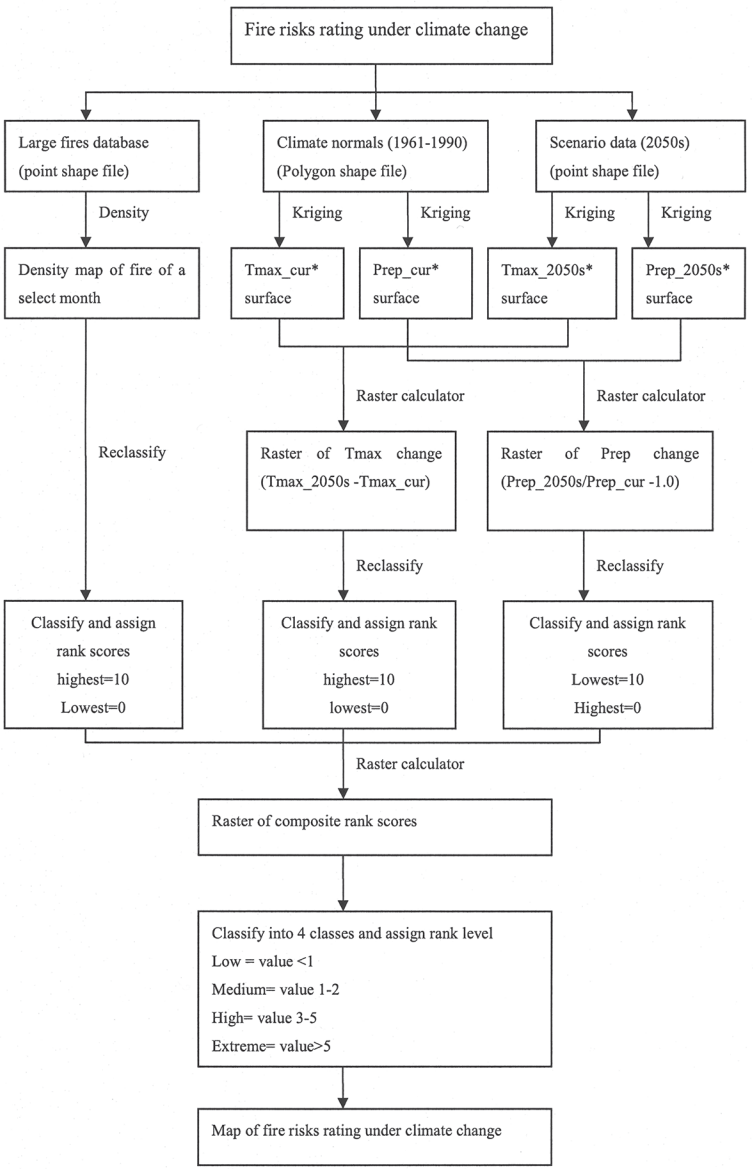

Figure 4: *GIS analysis flowchart for assessing fire risks under climate change.*

** Tmax_cur means averaged monthly maximum temperature for 1961-1990; Tmax_2050s means averaged monthly maximum temperature for 2040-2069; Prep_cur means averaged monthly precipitation for 1961-1990; Prep_2050s means averaged monthly precipitation for 2040-2069.*

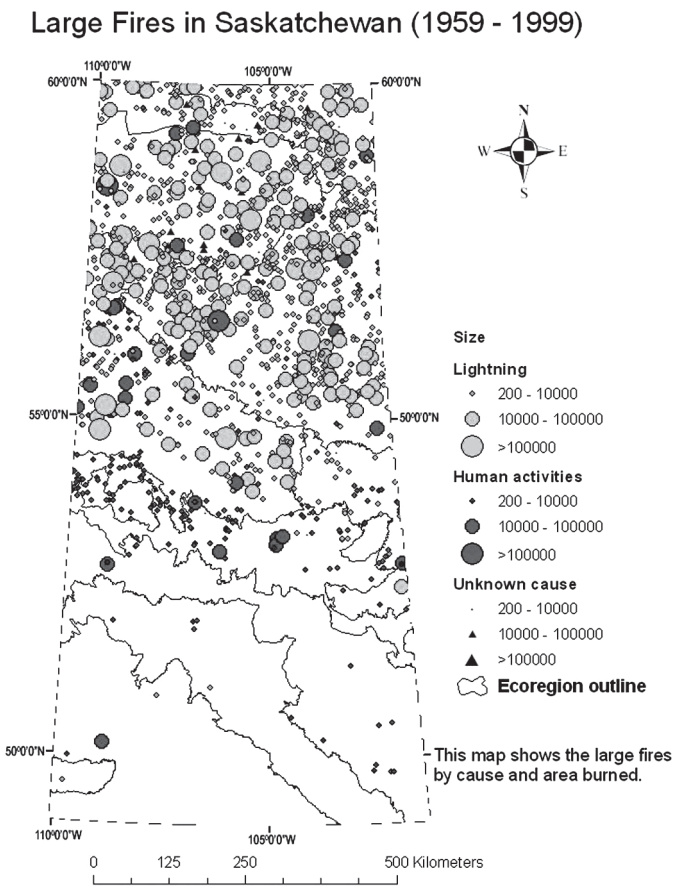

Figure 5: *Large fires in Saskatchewan.*

the total number of fires burning in June since the 1960s (Fig. 7) and a continual decrease in the percentage of human-caused wildfire in June since the 1960s (Fig.8), we conclude that June is a representative month to analyze the fire risks under climate change.

Present and future distributions of climate variables

In general, wildfire occurrence is directly proportional to temperature and inversely proportional to precipitation. That is, we would expect to see an increase in wildfire activity in hot, dry weather. The spatial distribution of wildfires plotted in Fig. 5 follows the measured temperature

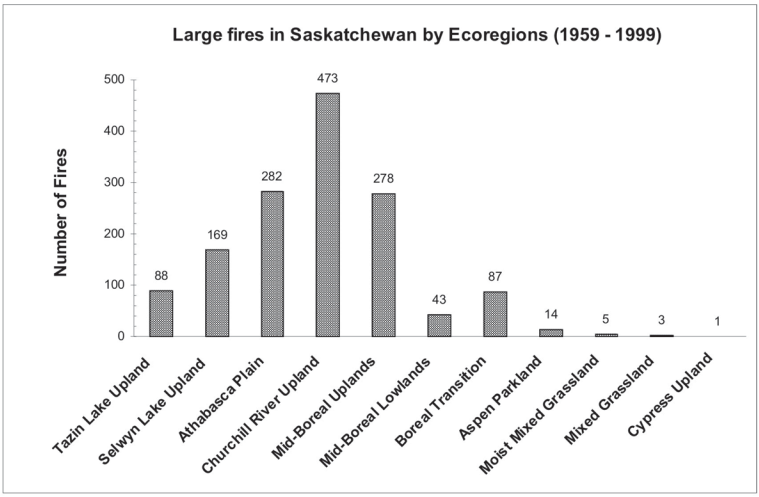

Figure 6: *Large fires in Saskatchewan by ecoregion.*

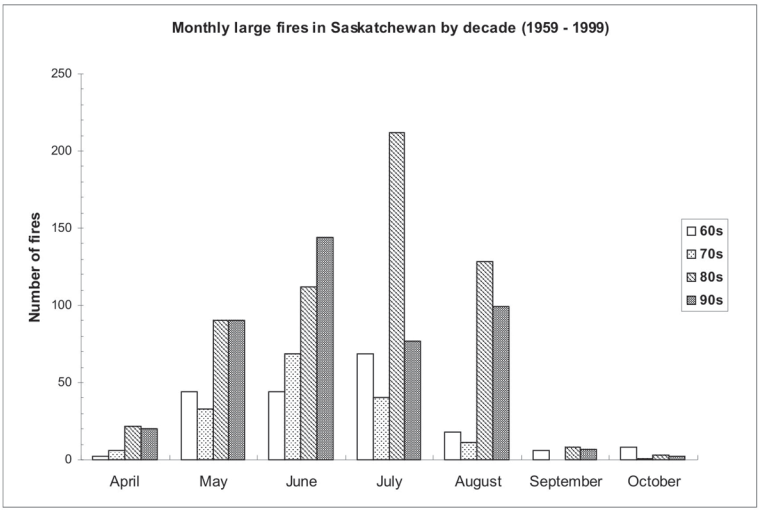

Figure 7: *Large fires in Saskatchewan by month and decade.*

and precipitation patterns in Saskatchewan, thereby supporting our development of the climate change wildfire index to model wildfire activity.

According to the Intergovernmental Panel on Climate Change (IPCC, 2001), the global average temperature increased during the twentieth century, with 1980s and 1990s as the hottest decades in the instrumental

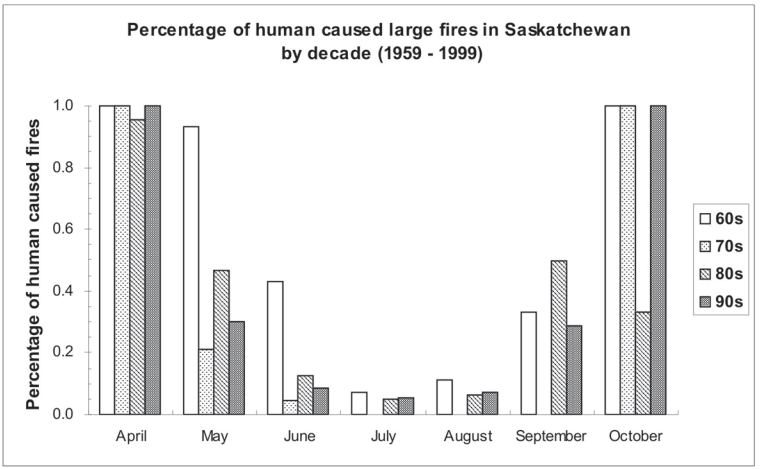

Figure 8: *Percentage of large fires of human origin in Saskatchewan.*

record. This has implications for the wildfire regime in Saskatchewan. For example, Fig. 7 shows marked increases in wildfire occurrences during the 1980s and 1990s.

Fig. 9 presents the average maximum June temperatures for the 1960-1990 climate normal, the CGCMI GA1 projection for 2050s, and the differences between them. The modeled temperature scenario projects an overall increase in maximum June temperatures. The highest increase range is 4-5 ^{0}C, found between the Tazin Lake Upland and Athabasca Plain ecoregions in the northernmost reaches of the province. In general, greater temperature changes are expected in northern Saskatchewan than in the south.

Fig. 10 illustrates the average June precipitation for both the current climate normal and the modelled climate for 2050, as well as their differences. Most regions in Saskatchewan will experience precipitation increases under this climate scenario. The largest precipitation increase will occur in eastern Churchill River Upland along the boundary between Saskatchewan and Manitoba. However, the model also projects precipitation decreases in some regions with the largest negative changes occurring in the western Tazin Lake Upland, western Athabasca Plain, and western Mid-Boreal Upland ecoregions.

Climate change wildfire index:

We input the projected temperature and precipitation data into our climate change wildfire model to map the distribution of potential wildfire risks in 2040-2069. Fig. 11 shows the spatial distribution of the wildfire

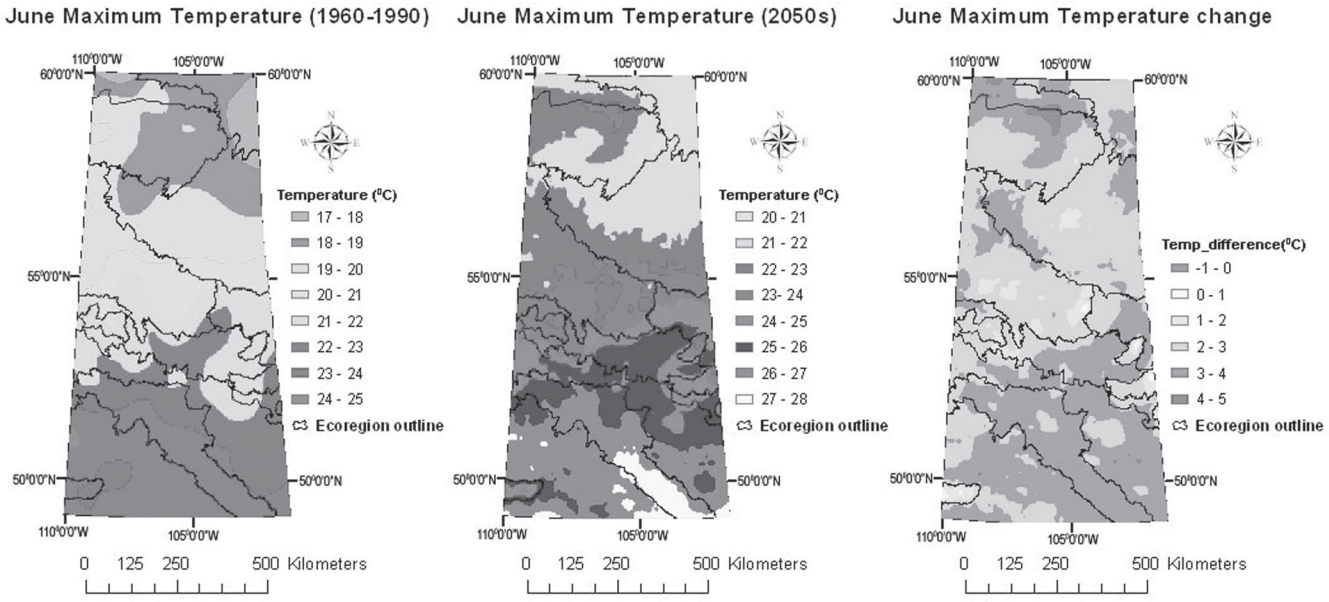

Figure 9: *June maximum temperature maps: left - June maximum temperature for 1960-1990; center – June maximum temperature for 2040-2069(2050s); right – June maximum temperature change between current period (1960-1990) and future period (2040-2069).*

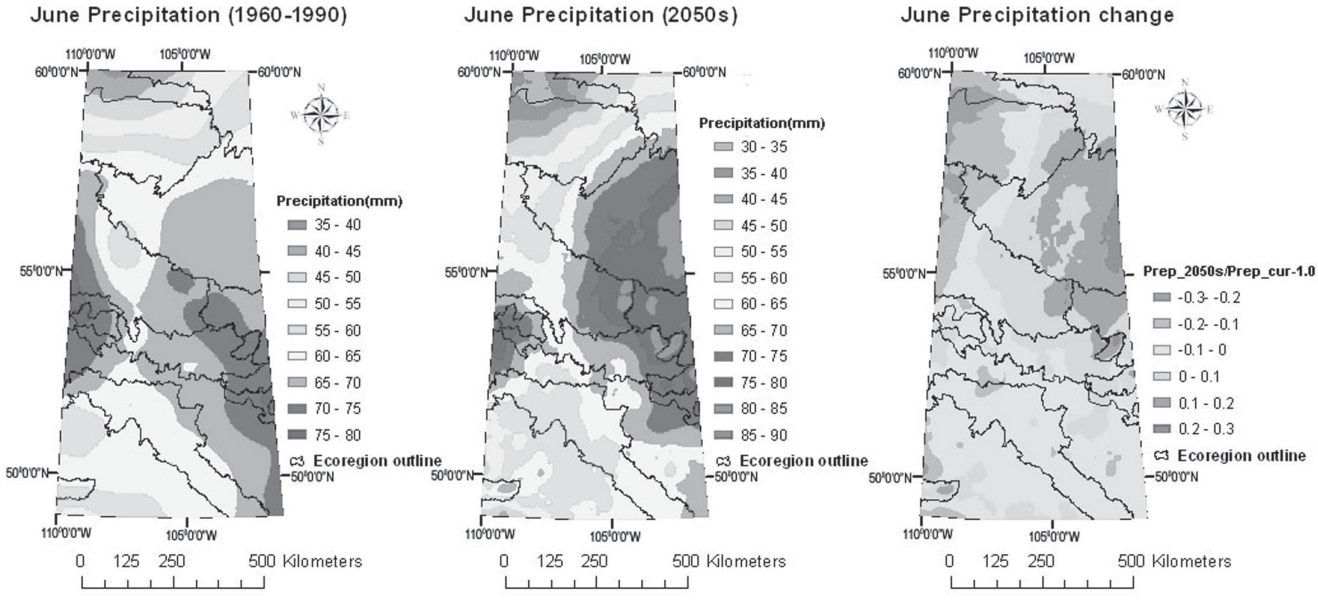

Figure 10: *June precipitation maps: left - June precipitation for 1960-1990; center – June precipitation for 2040-2069(2050s); right – June precipitation change percentage for future period (2040-2069) based on current period (1960-1990).*

index in comparison to the location of present wildfires. The density map in Fig.11 shows that the larger number of lightning-caused wildfires occurred in the eastern Churchill River Upland, central Mid-Boreal Upland and eastern Athabasca Plain (red and brown area) while the green area in the density map represents the regions that could experience a reduction in lightning-caused fires. The wildfire risk map in Fig.11 shows that the high and extreme wildfire risk area (brown and red region) has moved from east side of northern Saskatchewan to west side of northern Saskatchewan. The model projects enhanced fire risks in the Churchill River Upland, Tazin Lake Upland, Athabasca Plain, and Mid-Boreal Upland ecoregions. In general, our model projects the high fire occurrence regime will shift to the west in northern Sasktchewan.

Summary and Conclusions

In this research, we applied a climate change wildfire index to analyze the wildfire risks in Saskatchewan under a future climate scenario. The index is calculated from three indicators: present wildfire occurrence, future temperature projection, and future precipitation projection. The results showed that the region of highest risk in June would shift to the west under climate change in northern Saskatchewan. The change has many implications for current fire management activities, such as pre-positioning of resources, preparedness planning, prioritization of fire and forest management activities, and fire threat evaluation. The recent studies show that adaptation strategies such as fire-smart communities (Partners in Protection 2003) and fuels management to limit area burned (Hirsch et al. 2001) are likely to be evident solutions created to respond to climate change.

In this study we intentionally restricted our climate projection to the output from a single general circulation model to simplify our wildfire index development and testing. In the future, different climate change scenarios could be applied to examine the robustness of the index. Further, including higher temporal and spatial scale satellite data would enable more detailed fuel and burn models to be incorporated into the projection analyses.

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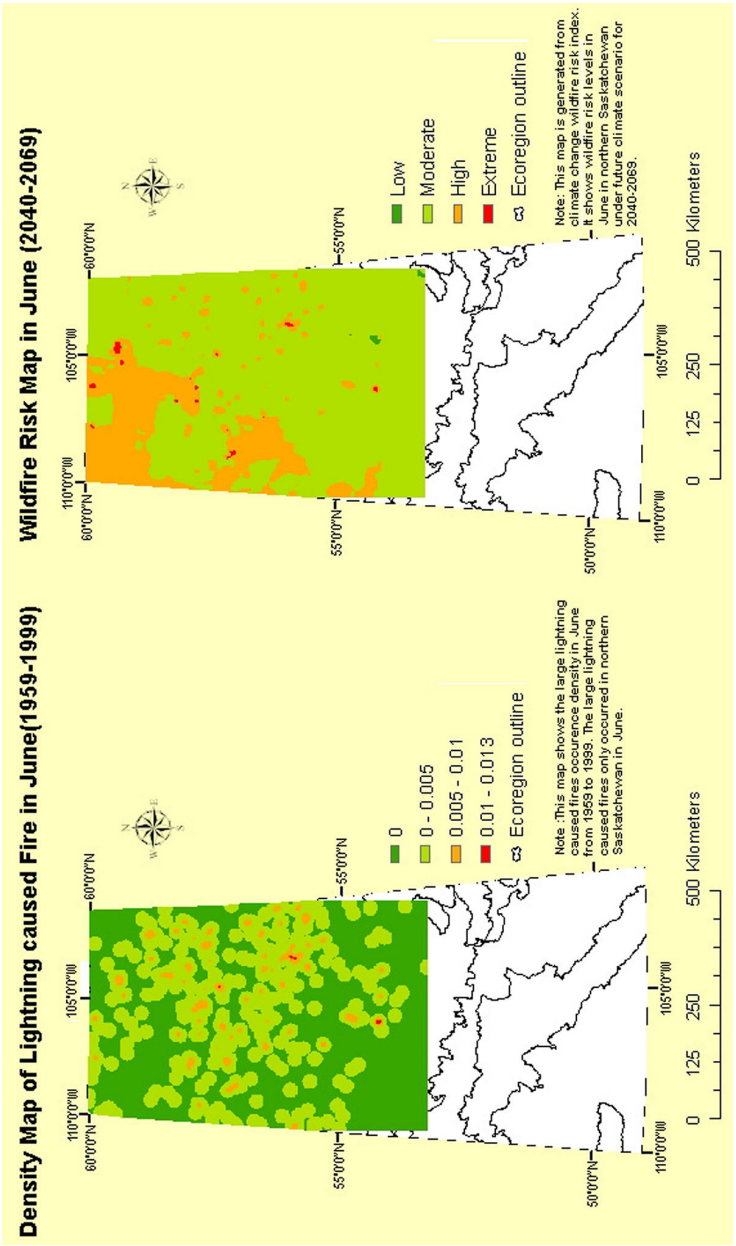

Figure 11: *Maps of fire risks under climate change: left – Density map of lightning-caused fire in June for 1959-1999; right – Wildfire risk map in June for 2040-2069.*

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The extent and characteristics of glaciolacustrine and other deposits in the Otter Lake basin, Riding Mountain, Manitoba

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Abstract: The 2005-06 core-sampling program in the Glacial Lake Proven basin was designed to provide subsurface sedimentological data to the base map data and provide estimates of lacustrine sediment thickness in Glacial Lake Proven. Four cores extracted from the Otter Lake sub-basin indicate that Glacial Lake Otter, a contemporaneous and contiguous supra-terminoglacial lake covered an area significantly larger than previously described.

The sediments appeared to represent a variety of lacustrine environments: lacustrine complexes and lake-margin deposits. Coarser sediments associated with fluvial environments overlay these. An Upper Rolling River core sample, located near the eastern end of the valley, indicates the presence of terminoglacial lacustrine sediments whose full depth remains unknown. A second core, placed to the west of the Scandinavia pit, on the present-day Otter Lake shoreline, closely matched the thick sequence of deposits exposed in the west Scandinavia pit. The core deposits are underlain by an unknown depth of deep-water glacial lacustrine silts/clays.

In addition to the cores, new exposures in the Scandinavia Pit were also described and interpreted. The facies showed a mix of glaciofluvial and debris flow sediments.

Introduction

Glacial ice covered the entire Riding Mountain Uplands during the late Wisconsinan (20,000 - 12,000 B.P.) with ice flow generally towards the southeast (Klassen 1966, 1979; McGinn 1991). Waning and downmelting of the last ice advance, named the Falconer Ice Advance (Fenton et al. 1983), resulted in the stagnation of glacial ice on the Riding Mountain

Uplands, first on the higher Eastern Uplands later on the Western Uplands (Klassen 1966). The Horod Moraine (Figure 1) is believed to be the hinge point for a two-stage ice stagnation model first postulated by Klassen in 1966 (McGinn 2002). Meltwaters ponded over the stagnant ice on the Eastern Uplands, creating small thermokarst supraglacial lakes and later an integrated network of ice-walled supraglacial lakes (McGinn 1991). Klassen (1966) named the largest of these ice-walled lakes Glacial Lake Proven (Figure 1).

Glacial Lake Proven appears to have begun as an elongated shallow ice marginal supraglacial lake formed in a transition zone between the stagnating ice of the Eastern Uplands and the neutral ice of the Assiniboine Lobe to the southwest (McGinn 2002). The eastern ridge of the Horod Moraine was deposited at the northwestern extension of this transition zone (Figure 1). Stratigraphic sections in the moraine indicate that this feature is an ice marginal ridge (Jurgaitis and Juozapavicius 1988) characterized by stratified and unstratified sands and gravels, large till inclusions and slump features (McGinn 1997). Incipient supraglacial Glacial Lake Proven drained towards the east paralleling the eastern extension of the stagnating ice - Assiniboine Sublobe transition zone (McGinn 2002).

Depositional evidence suggests that there was a rich sediment supply in that over 5 to 8 m of silt to coarse sands are exposed in sections east and southeast of the Eastern Ridge of the Horod Moraine (Klassen 1979 and McGinn 2002). The lithofacies and textural characteristics of the sediments suggest that they were deposited and remained in a subaqueous position. Some of the lacustrine deposits depict the characteristics of a supraglacial lacustrine complex (Brodzikowski and Van Loon 1991), with alternating layers of sands and silt. There is some regular lamination of the finer sand and silt, evidence of coarse intercalations and dropstones. Most of the sequence, however, can be classified as supraglacial lacustrine bottomsets (McGinn 2002). Early Glacial Lake Proven drained over stagnant ice into the Otter Lake sub-basin and then eastward into the Upper Rolling River - McFadden Valley - Polonia Trench spillway system Figure 1). As Glacial Lake Proven enlarged, transitioning from a supraglacial lake to a terminoglacial lake, the higher elevation ice marginal outlet channel was abandoned in favour of the relatively lower elevation Upper Rolling River outlet (Figure 1), which drained into the same eastern spillway system (McGinn, 1991, 2002). This spillway system was in operation for a long period of time, probably throughout the history of Glacial Lake Proven.

There are no known exposures of the terminoglacial lacustrine sediments in the Glacial Lake Proven basin. Consequently the authors undertook a "Geoprobe "coring project in the summers of 2005-2006. The Geoprobe is a truck-mounted direct push hydraulic coring rig that can

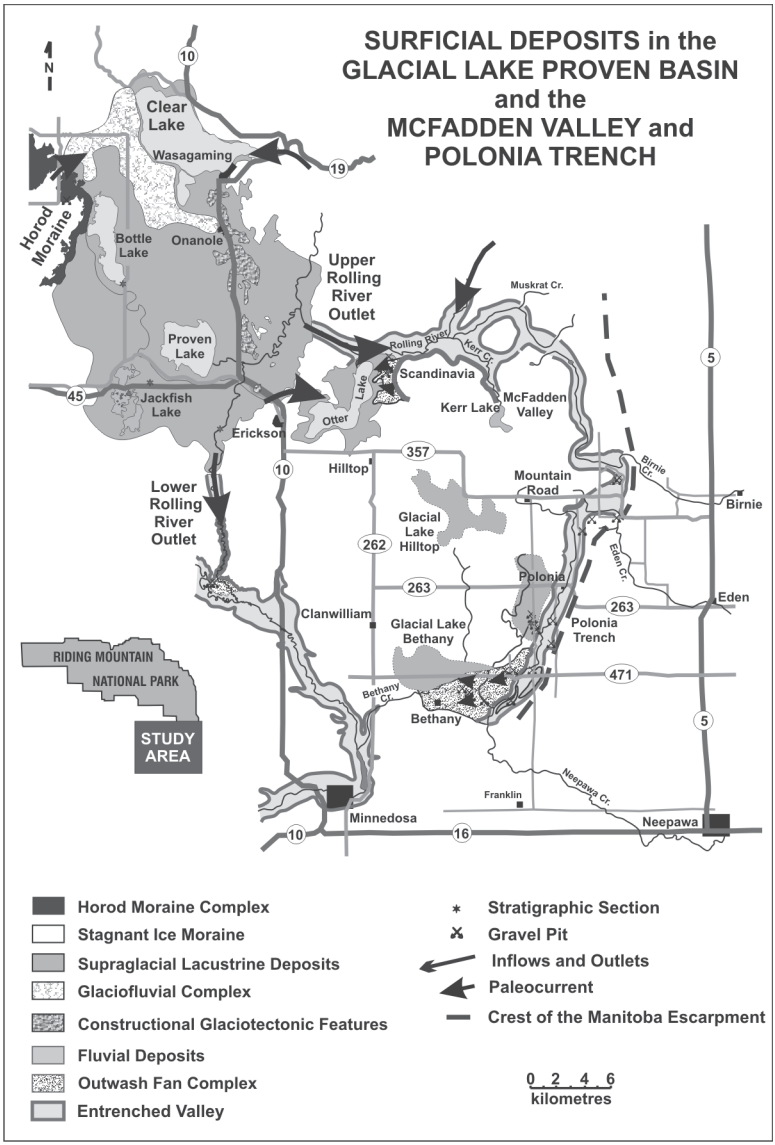
SURFICIAL DEPOSITS in the
GLACIAL LAKE PROVEN BASIN
and the
MCFADDEN VALLEY and
POLONIA TRENCH
N
Clear Lake
Wasagaming
Horod Moraine
Bottle Lake
Onanole
Proven Lake
Jackfish Lake
Upper Rolling River Outlet
Lower Rolling River Outlet
Muskrat Cr.
Rolling River
Kerr Cr.
Scandinavia
Lake
Otter
Kerr Lake
McFadden Valley
Erickson
Hilltop
Mountain Road
Birnie Cr.
Birnie
Glacial Lake Hilltop
Eden Cr.
Eden
Polonia
Clanwilliam
Glacial Lake Bethany
Polonia Trench
Bethany Cr.
Bethany
Franklin
Neepawa Cr.
Minnedosa
Neepawa
RIDING MOUNTAIN
NATIONAL PARK
STUDY AREA
10
19
45
357
262
263
471
5
16
Horod Moraine Complex
Stagnant Ice Moraine
Supraglacial Lacustrine Deposits
Glaciofluvial Complex
Constructional Glaciotectonic Features
Fluvial Deposits
Outwash Fan Complex
Entrenched Valley
Stratigraphic Section
Gravel Pit
Inflows and Outlets
Paleocurrent
Crest of the Manitoba Escarpment
0 2 4 6
kilometres

Figure 1

extract up to 15 m of soft unconsolidated sediment such as fine gravels, sands and silt (Wiseman *et al*. 2002). Thick diamicts are rarely penetrated. Six cores were extracted in the Glacial Lake Proven basin and up to 7.5 m of terminoglacial lacustrine sediments described. During the summer of 2006, four cores were extracted in the Otter Lake-Upper Rolling River spillway, the Otter Lake sub-basin (Figure 2).

Objective of the 2006 Coring Project

The objectives of the Otter Lake sub-basin coring project were threefold:

1. To verify the presence of glaciolacustrine sediments in the Glacial Lake Otter sub-basin and its natural extension; the Upper Rolling River spillway,
2. To define the mapable limits of these glaciolacustrine sediments and
3. To identify the types of glaciolacustrine sediments.

Glacigenic Sediments

In 1989, the INQUA Commission on the Genesis and Lithology of Quaternary Deposits published a Genetic Classification of Glacigenic Deposits (Goldthwaite and Matsch, eds. 1989). In this volume, Jurgaitis and Juozapavicius (1989) outline the importance of the geomorphic and lithologic parameters, which are recommended for study when investigating glaciofluvial deposits, and they developed a genetic classification of glaciofluvial deposits. In the same publication, Ashley (1989) reviews the sedimentary processes and lithofacies units in glacier-fed lakes and establishes lithofacies groups with commonly occurring lithofacies units. The lithologic criteria outlined in this publication will be used in this research.

Brodzikowski and Van Loon (Developments in Sedimentology 49, 1991) present a synthesis of Glacigenic Sediments and establish a systematic classification based on depositional subenvironment, facies and the characteristics of the deposits. The Brodzikowski and Van Loon nomenclature is also employed in this research.

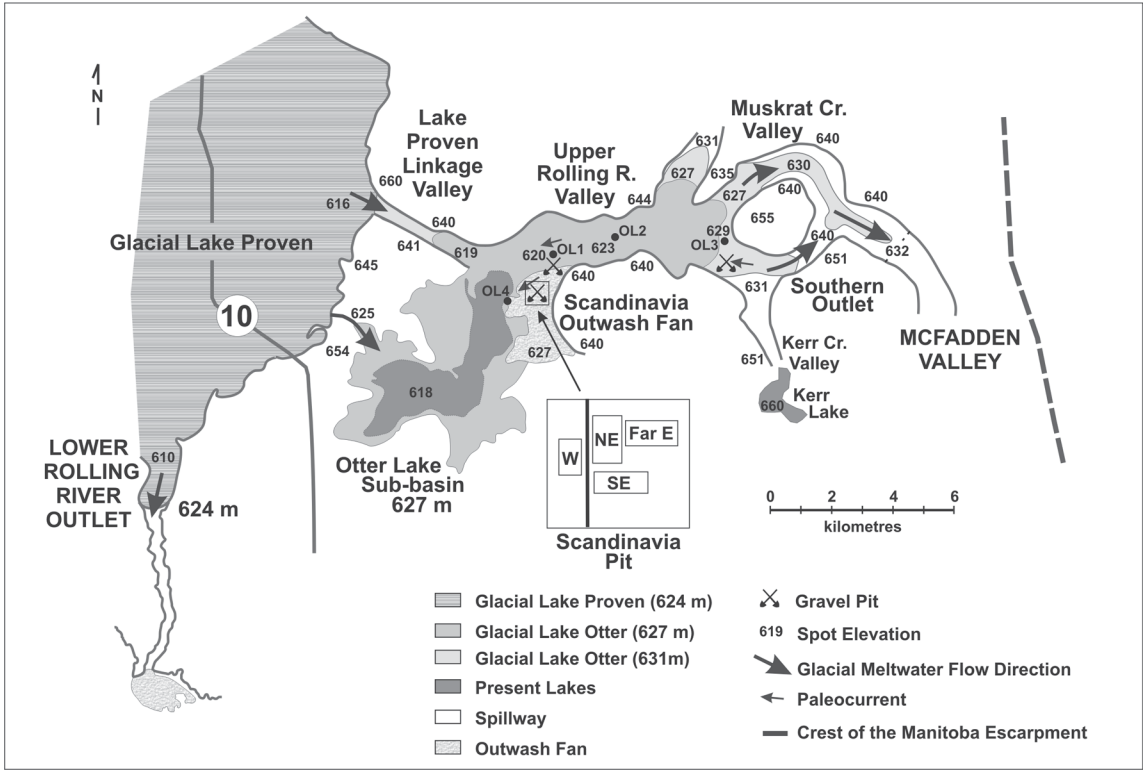
N
Glacial Lake Proven
10
Lake Proven Linkage Valley
Upper Rolling R. Valley
Muskrat Cr. Valley
Southern Outlet
MCFADDEN VALLEY
Kerr Cr. Valley
Kerr Lake
Scandinavia Outwash Fan
Otter Lake Sub-basin 627 m
LOWER ROLLING RIVER OUTLET
624 m
OL1
OL2
OL3
OL4
W
NE
Far E
SE
Scandinavia Pit
0 2 4 6
kilometres
Glacial Lake Proven (624 m)
Glacial Lake Otter (627 m)
Glacial Lake Otter (631m)
Present Lakes
Spillway
Outwash Fan
Gravel Pit
Spot Elevation
Glacial Meltwater Flow Direction
Paleocurrent
Crest of the Manitoba Escarpment

Figure 2

Otter Lake Sub-basin Physiography

The Otter Lake-Upper Rolling River Spillway system can be subdivided into three spillway/ valley reaches and a storage basin: the Muskrat Creek valley, the Upper Rolling River valley, the Proven Lake basin valley linkage and the Otter Lake storage basin (Figure 2).

Table 1 summarizes the reach and storage basin geometric parameters (McGinn and Zaniewski 2003). The data were derived from the National Topographic Database and included a hypsometric elevation layer. The Spatial Analyst extension of the ArcGIS 8.2 was used to generate the TIN surface representation and to obtain numerous morphometric measurements, summarized in Table 1. The area analyzed corresponds with the NTS map sheet 62J12.

The physiography suggests 9-11m of fluvial scoured depths in all three valley reaches (Table 1). The width of the Upper Rolling River valley segment, however, is twice that of Muskrat Creek tributary valley and twice the width of the Proven Lake basin linkage valley (Table 1), suggesting greater lateral scour in the Upper Rolling River valley. McGinn

Table 1: *Physiography of the Otter Lake-Upper Rolling River sub-basin.*

Spillway Valley Component		Length	Width	Depth
Spillway Valley Channels				
Muskrat Creek Valley		5400 m	602 ±129 m	10-11 m
Rolling River Valley		6500 m	1531 ±158 m	10-11 m
Proven Lake Basin Link		5200 m	693 ±130 m	9-10 m
Spillway Valley Rim				
Maximum height	650 m			
Minimum height	632 m			
Outwash Fan				
Surface elevation	627 m			
Otter Lake Sub-basin				
Lake surface elevation		618 m	Maximum Depth	2 m
Lake surface elevation		625 m	Maximum Depth	9 m
Storage capacity		205,000 dam^3		
Lake surface elevation		631 m	Maximum Depth	13 m
Storage capacity		683,000 dam^3		

and Zaniewski (2003) suggested that this could be associated with an outburst flood in the Upper Rolling River valley. Alternatively, the wider Upper Rolling River valley could represent a northeastern extension of the Otter Lake sub-basin, a glaciolacustrine genesis.

Storage in the Otter Lake sub-basin has been calculated to exceed 205,000 dam^3 if water levels were to rise seven metres from the current lake level (618 m) to 625 m elevation, the estimated mean surface elevation of the Scandinavia outwash fan (Table 1). It is probable that the water levels in the Otter Lake sub-basin achieved at least 631m since the outlet sill in the McFadden Valley is estimated to be just less than 632 m. Storage capacity at 631m elevation was estimated to be 683,000 dam^3 (Table 1).

The Scandinavia deposit (Mihychuk and Groom 1979) has the planimetric shape of a composite sandur or Hjulstrom-type delta deposited in the Otter Lake sub-basin by the sediment-rich water entering the basin from north-east and east (Figure 2). An Hjulstrom-type delta is a gently sloping, shallow water (subaqueous)-landform deposited at the distal end of a sandur plain (Benn and Evans, 1998).

Sediments in Exposed Stratigraphic Sections in the Otter Lake Basin

Upper Rolling River Borrow Pits:

The Upper Rolling River borrow pit (> 2m of fluvial sands and gravels) mapped by McGinn in 1989 has been landscaped. However a second borrow pit recently excavated in the lower reaches of the Kerr Creek exposed a 2 m thickness of fluvial sands and gravels. While there was no evidence of small-scale paleocurrent indicators (ripples, dune foresets etc.), the sand and gravel plane beds dip slightly towards the west. Pebbles were elongated down flow towards the west and the a-b planes paralleled the sedimentary surface.

The Scandinavia Pits:

The Scandinavia Pits expose the sedimentary sequence deposited in the northern part of the Scandinavia deposit. The site was visited on seven different occasions 2002-2006. Observations and photographs were taken. Six stratigraphic sections were described and textural, lithologic and fabric samples were collected. The Scandinavia Pits can be subdivided

into four working units: the inactive Far East Pit, the Northeast Pit, the Southeast Pit and the newly exposed and active West Pit (Figure 2). The Far East and Southeast pits have been inactive for many years. There appears to be no information available from the Mihychuk and Groom (1979) or Groom (1980) mappings. McGinn visited the Northeast Pit in 1989. Two photographs and west wall section notes are available for evaluation.

The Northeast Pit: Description and Interpretation of the Stratigraphic Section:

The general description of the west wall of the Northeast Pit is derived from 1989 notes, sketches and photographs and published in McGinn and Zaniewski, 2003. Three stratigraphic units are described. Unit 1 is interpreted as a fluvial or glaciofluvial deposit of fine to medium gravels with well-sorted sand lenses. Unit 2 is described as a diamict-type deposit, a glacial till (melting ice facies), or more likely a mass transport deposit, perhaps laid down in an aqueous environment (a "flowtill"). Unit 3 is interpreted as massive glaciofluvial (ice contact) sands and gravels. Paleocurrent indicators (dune foresets) suggest a flow towards the west or southwest.

The West Pit: Description and Interpretation of the Stratigraphic Sections:

McGinn and Zaniewski (2003) mapped four stratigraphic sections in the active West Pit, two along the south wall and two along the west wall. In their 2003 paper, the four sections were combined to produce a south wall view, a west wall view and a composite stratigraphic section (Appendix 1).

Three stratigraphic units were identified. Unit 1 was described as a fining upwards, stratified, horizontally laminated deposit of sand and gravel. The a-b planes of flattened clasts parallel the sedimentary surface. The unit was interpreted to be a transition from terminoglacial deltaic complexes and/or topsets of an Hjulstrom-type delta to a terminoglacial fluvial facies (McGinn and Zaniewski 2003).

Unit 2 is a 1.5m thick diamict-type deposit. The deposit is massive and unsorted but can be sub-divided into five relatively distinct sub-units. The matrix composition generally fines upward. The largest cobbles and boulders, however, occur at the top of the unit (2a). Most of the fines appear to have been washed out during transport as the matrix composition is described as very coarse gravels to coarse sands. Clast fabrics in Unit 2B2 show a strong NNE to SSW fabric. Fabrics in Unit 2B1 are bi-directional, ENE to WSW and perpendicular to the primary direction (ESE to WNW).

The unit was interpreted to be a subaqueous mass transport facies, a high concentration debris flow (McGinn and Zaniewski 2003).

McGinn and Zaniewski (2003) described Unit 3 as a supraglacial fluvial or terminoglacial fluvial facies. The fluvial complexes and streamflood deposits were a poorly sorted massive coarse-grained deposit with gravel or diamict-type mixtures. Clast imbrications, particularly at the base of the sediment indicate the presence of strong currents. The deposits are interpreted to be associated with high-energy flow conditions and rapidly changing flow regimes. Waning flows result in a general fining upward (McGinn and Zaniewski 2003).

The West Pit, Northern Extension Sections:

In 2006 the authors revisited the Scandinavia Pits and mapped two "New" sections in a recently extended West Pit. The "New" West Wall section is a continuation of the previously described McGinn and Zaniewski (2003) West Wall section. All three units are present. Unit 1 is 0.55 m clast-supported coarse sand to medium gravel that has a diamict-like appearance. The distinctive 1.86 m thick diamict units 2A, 2B1, 2B2, 2C1 and 2C2 (McGinn and Zaniewski 2003) can be traced along the entire west wall, however the unit appears to thin significantly and interfinger with a thicker and more obvious stratified fluvial Unit 1 in the undescribed North Wall section. Unit 3, in this "New" West Wall exposure, is described as coarse to medium sand and gravel foreset beds with an apparent SSW dip of 20^{o} - 30^{o}. The contact with Unit 2C2, a lower grey shale gravel diamict, is erosional and there is significant ironstaining in the moderately well-sorted Unit 3.

The East wall section, approximately 60 m to the east of the "New" West Wall section, is described as 1.90 m of stratified fluvial sands, granules and gravel with fine grained intercalations. There is some evidence of cross-bedding. The a/b planes of flattened clasts are orientated parallel to the respective sedimentary surface. Unit 2, is a 0.68 m thick, diamict similar in appearance (colour, texture and lithologies) to unit 2A and 2B1 (McGinn and Zaniewski 2003). The unit matrix is sandy, containing few fines and numerous large clasts. All cobble/boulder size clasts are of shield metasedimentary or Interlake carbonate lithologies. Unit 3 is described as a moderately well sorted sands and gravel foresets. Foresets dip towards the SSW at 20^{o}-30^{o}. Lateral variations in texture (sand foresets, gravel foresets to coarse sand foresets) are common. Ironstaining throughout the unit is common. Along the northern edge of the section, the unit is suddenly truncated by a diamict similar in colour, texture and lithologies to Unit 2C (McGinn and Zaniewski 2003). This diamict is overlain by the northern extension of the Unit 2 diamict.

The Otter Lake Basin Cores

Four "GeoProbe" cores were taken in the Otter Lake basin-Upper Rolling River Valley (Figure 2). Otter Lake 1 (OL1) was extracted in the Upper Rolling River Valley approximately 2.5 km ENE of the present day outlet of Otter Lake (Figure 2). The site elevation is was recorded to be 620 m a.s.l., approximately 2 m above current lake level. The 7.35 m core is generally described as 2.08 m of laminated fine sand and silt grading upward to thinly bedded sands and silts (Figure 3). Below this unit, 0.80 cm of oxidized massive fine sand overlie 2.57 m of rhythmiticly bedded fine sand and silt. This stratigraphic unit contains a 30 cm thick diamict at a depth of approximately 3.10 m. Below the diamict the laminated fine sand and silt show evidence of loading deformation and faulting. The basal 1.91 m is logged as massive silty clay. The sedimentological evidence in OL1 was interpreted to represent a supraglacial-terminoglacial lacustrine facies arguably overlain by 3 m of Holocene lacustrine sediments.

Two additional cores, OL2 (623 m a.s.l.) and OL3 (629 m a.s.l.) were collected progressively up-valley (Figure 2). The Otter Lake 2 core (Figure 3) is generally 3.25 m of glacial fluvial/fluvial sands and gravels overlying 2.17 m of shallow water lacustrine complexes consisting of beds of well-sorted medium to coarse sands and granules alternating with laminated fine sands and silt. This unit overlies rhythmiticly bedded massive silty clay with laminated fine sand and silt; deep-water supraglacial-terminoglacial lacustrine bottomsets. OL3 records a similar sequence although in this core the glacial fluvial sequence is approximately 9.0 m thick and the inferred supraglacial-terminoglacial lacustrine bottomsets are exposed in the bottom 0.20 m of core (Figure 3). This unit is described as massive silty clay with a few core barrel size clasts. The sediment is definitely water laid and the clasts are considered to be dropstones.

A fourth "GeoProbe" core (OL4) was extracted a few metres from the shore of Otter Lake, 0.8 km to the west and downslope of the West Pit sections in Scandinavia Fan (Figure 2). The objective of this coring was twofold: to determine the origin of present day Otter Lake and to search for downslope evidence of the Scandinavia fan deposit. The surface 1.2 m of saturated sands and gravels was lost from the core. A 1.3 m thick "brown diamict" overlies a 0.67 m thick "grey" diamict (Figure 3). These diamicts are interpreted to be the downslope extension of Units 2B and 2C exposed in the West Wall section of the West Scandinavia Pit. Over 6 metres of sands and gravels underlie the diamicts (Unit 3?) itself underlain by over 0.8 m of massive silty clay (Figure 3). Core barrel size dropstones are common in this proximal deep-water glaciolacustrine deposit.

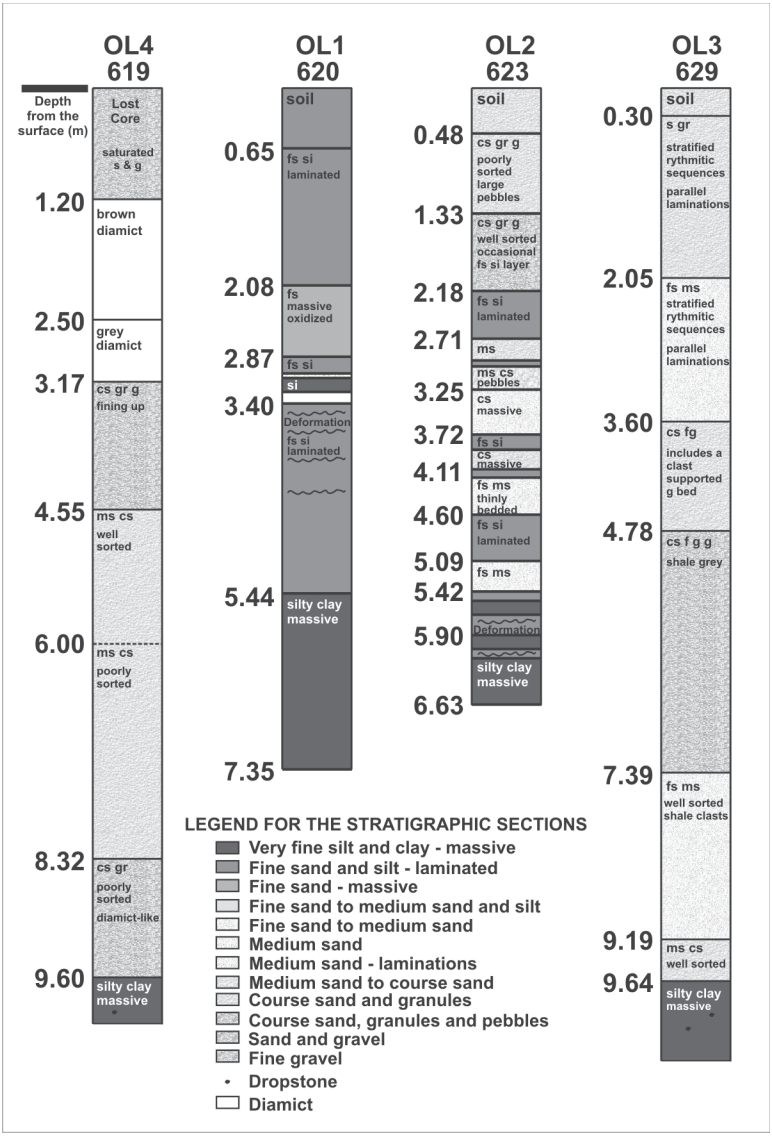
OL4
619
Depth from the surface (m)
Lost Core
saturated s & g
1.20
brown diamict
2.50
grey diamict
3.17
cs gr g
fining up
4.55
ms cs
well sorted
6.00
ms cs
poorly sorted
8.32
cs gr
poorly sorted
diamict-like
9.60
silty clay massive
OL1
620
soil
0.65
fs si
laminated
2.08
fs
massive
oxidized
2.87
fs si
si
3.40
Deformation
fs si
laminated
5.44
silty clay massive
7.35
OL2
623
soil
0.48
cs gr g
poorly sorted
large pebbles
1.33
cs gr g
well sorted
occasional fs si layer
2.18
fs si
laminated
2.71
ms
ms cs
pebbles
3.25
cs
massive
3.72
fs si
cs
massive
4.11
fs ms
thinly bedded
4.60
fs si
laminated
5.09
fs ms
5.42
Deformation
5.90
silty clay massive
6.63
OL3
629
0.30
soil
s gr
stratified rythmitic sequences
parallel laminations
2.05
fs ms
stratified rythmitic sequences
parallel laminations
3.60
cs fg
includes a clast supported g bed
4.78
cs f g g
shale grey
7.39
fs ms
well sorted
shale clasts
9.19
ms cs
well sorted
9.64
silty clay massive
LEGEND FOR THE STRATIGRAPHIC SECTIONS
Very fine silt and clay - massive
Fine sand and silt - laminated
Fine sand - massive
Fine sand to medium sand and silt
Fine sand to medium sand
Medium sand
Medium sand - laminations
Medium sand to course sand
Course sand and granules
Course sand, granules and pebbles
Sand and gravel
Fine gravel
Dropstone
Diamict

Figure 3

Interpretation and Discussion

Glacial Lake Otter and the Upper Rolling River Valley:

The presence of a deep-water glaciolacustrine complex at the base of the Otter Lake 4 core challenges the hypothesis that present-day Otter Lake is a kettle lake, specifically that the sub-basin was a stagnant ice block. It appears that Glacial Lake Otter began as an ice-walled supraglacial lake located in the present day Otter Lake area. This thermokarst lake expanded rapidly towards the northeast, probably incorporating other smaller supraglacial lakes, along a zone of weakness between stagnant ice on the higher Eastern Uplands to the north and the stagnating ice towards the south. Sedimentary sequences exposed in the Upper Rolling River Valley cores indicate that the supraglacial/terminoglacial lake Otter extended far up the Upper Rolling River Valley, probably to the Southern Outlet channel (Figure 2) and the confluence of the Muskrat Creek valley (the Northern Outlet channel). Water levels in this "river lake" are estimated to have risen quickly during a supraglacial lake stage from 627 m to at least 631 m. Lake levels probably exceeded 640 m, the minimum surface elevation in the Southern Outlet channel. As a consequence, the wider physiography of Upper Rolling River Valley (Table 1) is interpreted to be of glacial lacustrine origin. Glacial Lake Otter initially drained into the McFadden Valley-Polonia Trench Spillway System by way of the Southern Outlet channel (Figures 1 and 2).

The Nature of the Glaciolacustrine Sediments in Glacial Lake Otter:

Glaciolacustrine sediments appear in all four Otter Lake sub-basin cores.

Depositional evidence suggests that there was a rich sediment supply into Early Glacial Lake Otter depositing over 7.0 m in deeper parts of the lake and an undetermined depth of sediment near the southern outlet. The sediments are classified as glacial lacustrine complexes, in that there is no sedimentological distinction evident between lacustrine bottomsets and lake margin deposits. These lacustrine complexes consist of mixtures of dropstone-rich fine sand and silty clay varvites, and debrisflow mass transport diamicts. The deeper water lacustrine complexes grade to lake margin deposits as water levels fluctuated. The lake margin deposits are relatively thick units (up to 1.5 m) of laminated medium sands/fine sands or fine sands/silts. There is often evidence of coarse intercalations and material supplied by mass movement or wash-off, and numerous dropstones. Massive coarse sands and gravelly beds are indicative of periods of higher energy.

Outburst Flood Hypothesis:

McGinn and Zaniewski (2003) proposed that a glacial lake outburst into a much smaller Glacial Lake Otter was responsible for some of the sedimentary evidence (Unit 3) exposed in the west Scandinavia Pit. The hypothesis stipulated that the meltwater and sediment carried by the outburst would have flooded into the Glacial Lake Otter basin from a smaller supraglacial lake located to the north or northeast of the Upper Rolling River valley. The magnitude and the extent of this event should have resulted in significant sedimentary deposits within or above the lacustrine sediments of the Upper Rolling River valley.

The Otter Lake Cores (OL1, OL2, and OL3) indicate that a terminoglacial lake, Glacial Lake Otter, at one time occupied the entire Upper Rolling River Valley. This evidence radically changes the McGinn and Zaniewski (2003) hypothesis. Specifically, the outburst flood could not enter Glacial Lake Otter in the Scandinavia Pit area but must have discharged into the lake several kilometres up valley. Consequently, sedimentological evidence of a major jokulhlaup-like glacial outburst should be present in the Otter Lake cores, specifically OL1 and OL2. There is no evidence of these types of deposits. In addition fresh exposures of Unit 3B in the west Scandinavia pit, suggest a reinterpretation of the unit previously described as "similar to the vertical lithofacies profiles of Icelandic 'limno-glacial jokulhlaup sandurs' described by Maizels (1993)" (McGinn and Zaniewski 2003). The new exposures of Unit 3B are described as ironstained sand, coarse sand and gravel foresets, deposits associated with a terminoglacial delta/outwash fan.

Summary and Conclusions

The 2005-06 core-sampling program in the Glacial Lake Proven basin was designed to provide subsurface sedimentological data to the base map data previously collected and provide estimates of nature and thickness of lacustrine sediment in Otter Lake sub-basin. Four cores extracted from the Otter Lake sub-basin indicate that Glacial Lake Otter, a contemporaneous and contiguous supra-terminoglacial lake to Glacial Lake Proven covered an area significantly larger than previously described.

The sediments appeared to represent a variety of terminoglacial lacustrine environments: lacustrine complexes grading to shallow water lake-margin deposits. Coarser sediments associated with fluvial environments overlay the glacial lacustrine deposits.

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Appendix I

The composite section of the West Pit (South Wall and West Wall)
(McGinn and Zaniewski, 2003)

Unit 1 interpreted to be a deltaic topset to fluvial facies transition and has been sub-divided into three sub-units:

0.0 Unit 1A.
Approximately 40 cm thick. Matrix supported silt/fine sand with fine-medium gravels lineations. A gradational boundary to 1B. No bird holes.

0.5 Unit 1B.
Approximately 1.0 m thick. A progressive non-erosive contact with 1A. Stratified medium to fine gravels with well-sorted sand lenses. A fluvial facies (plane beds) with alternating flow regimes. Bird holes. Bird holes tend to be constructed in the sand lenses. The floor of the bird holes tends to be finer sands, silt or gravel size clasts. There are no apparent sedimentary structures, deformation structures or paleocurrent indicators.

1.45 Unit 1C.
Approximately 0.05 - 0.1m thick. A progressive non-erosive contact with 1B. A coarse gravel matrix transition to 1B. No bird holes. There are no apparent sedimentary structures, deformation structures or paleocurrent indicators.

1.50 Unit 2A is interpreted to be a washed over diamict type deposit. Variable thickness, approximately 0.15-0.25m thick. An erosive contact with 1C. Cobbles/boulders and large clasts. All cobble/ boulder size clasts are of shield metasedimentary or Interlake carbonate lithologies. The matrix Graphic Mean size [(f84 + f50 + f16)/3] (Folk and Ward 1957) is approximately +0.05f, (0.96mm diameter). The matrix median size is +0.40f, (0.75mm). The Graphic Standard Deviation [(f84 - f16)/2] (Folk and Ward 1957), which can be interpreted as a sorting coefficient is equal to 3.52 f units. The sample contained only 6% by weight fines.

1.70 Unit 2B is approximately 0.7-0.9 m. thick and is sub-dividend into two sub-units. The unit is interpreted to be a subaqueous mass transport flow.

Unit 2B1
Variable thickness, approximately 0.3-0.4m thick. A progressive non-erosive contact with 2A. A diamict type deposit fining upward with occasional gravel stringers. The matrix Graphic Mean size is approximately +0.22f (0.84mm). The matrix median size is +0.75f (0.60mm). The Graphic Standard Deviation is 3.45 f units, very poorly sorted (Folk and Ward 1957). The sample contained approximately 9% by weight fines and fewer clasts and cobbles than 2A. The obvious higher moisture content as evidenced by a darker colour and a wetter feel may be attributed to the higher percentage of silt and clay than any other sub-unit. A bi-directional fabric. Primary azimuths of 60°-240°, secondary azimuths of 120°-300°.

2.05 Unit 2B2
Variable thickness, approximately 0.4 - 0.7m thick. Progressive non-erosive contact with 2B1. A diamict type deposit, fining upward but coarser than 2B1. The matrix Graphic Mean size is approximately –0.83f (1.78mm). The matrix median size is calculated to be -0.55f (1.45mm). The Graphic Standard Deviation is 2.73 f units, very poorly sorted (Folk and Ward 1957). The sample contained approximately

4% by weight fines and there are more clasts and more frequent gravel stringers than in 2B1. A strong fabric, azimuths of 30°-210°.

2.50 Unit 2C
Approximately 0.5-0.7m thick.

Unit 2C1
Variable thickness, approximately 20-40cm thick. Progressive non-erosive contact with 2B2. A matrix supported gravel diamict type deposit, coarser than B. The matrix Graphic Mean size is approximately –0.57f (1.48mm). The median size is -0.12f (1.10mm). The Graphic Standard Deviation of 2.55 f units indicates very poor sorting (Folk and Ward 1957). The sample contained approximately 3% by weight fines.

2.80 Unit 2C2
Variable thickness, approximately 20-40cm thick. A progressive non-erosive contact with 2C1. An extrapolated matrix Graphic Mean size of approximately –2.50f (5.65mm). The median size is –2.5f (5.65mm). The extrapolated Graphic Standard Deviation of 2.49 f units indicates very poor sorting. The sample contained less than 1% by weight fines. Matrix supported poorly sorted sands and gravels. A field lithology sample indicates 31% Shield igneous and metasedimentaries, 40% Interlake carbonates and 29% shales.

3.10 Unit 3.
Greater than 2.10 m thick. The unit is interpreted to be a supraglacial fluvial or terminoglacial fluvial facies composed of fluvial complexes and streamflood deposits.

Unit 3A
Massive glaciofluvial coarse sands and gravels. An erosive contact with 2C2. Distorted ripple and horizontal laminations occur in the 20cm-40cm thick sand lenses exposed in the west wall of the section. In the same sand lenses there are prominent compressive folds and minor reverse faults, perhaps associated with the deposition of Unit II and later dewatering.

3.35 Unit 3B
Greater than 1.80 m thick. A progressive non-erosive contact with 3A. Massive matrix supported medium to coarse gravels. There is

the impression of coarsening downwards with cobbles at base of section. Shale pebble imbrications are common in the poorly sorted, clast supported, gravel beds, particularly at the base of the sediment. The a-b plane of other lithologies parallels the sedimentary surface and generally dips towards the west

Wastewater reclamation and re-use in the Clear Lake watershed, Riding Mountain National Park, Manitoba

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Abstract: Wasagaming/Clear Lake in Riding Mountain National Park is a major attraction to the general public throughout the summer months. This has required the construction of appropriate infrastructure to treat sewage and other wastewater. The current system consists of three stabilization ponds in series. Research indicates that this lagoon cell system generally operates well and produces an effluent that consistently complies with Manitoba license effluent requirements. The third cell routinely has been discharged in late June into Ominnik Marsh, which connects to Clear Lake.

Recent policy decisions require that additions of nutrients to Clear Lake from all sources be reduced. This paper assesses the feasibility of fertigating hayland with sewage effluent as a means of avoiding further nutrient enrichment of Ominnik Marsh/Clear Lake.

Data gathered on effluent chemistry and toxicology support the reuse of this wastewater in an ecologically sustainable manner.

The biomass harvests of a 3-fold increase in the volume of fertigation wastewater per unit area were compared to the 1-fold wastewater fertigation per unit area and zero fertigation (controls). The 3-fold application of wastewater effluent resulted in no significant increase in yield or quality.

Pre and post fertigation soil sample were used to assess the cumulative and or negative impacts on soil chemistry, fertility and other physical properties and the potential for nitrite contamination of groundwater was examined. Soil chemistry and fertility showed no significant differences between fertigated plots and the control plots. There was no indication of nitrite or phosphorus build-up or leaching.

Forage biomass was assessed for toxicology, nutritional quality and commercial value in each replicated treatment both in an early and late harvest. Forage yields were consistent in biomass and nutritional quality. There were no significant differences between fertigated yields and the control yields.

Introduction

Proper treatment of municipal and industrial wastewater can provide water of such quality that should not be wasted but put to beneficial use. This thesis coupled with the increased frequency of water shortages, the high costs of water supply development and environmental protection, has provided an incentive to consider wastewater reclamation, recycling, and reuse in many parts of the world (Asano 1998; van de Graff *et al.* 2002; Magasan and Wang 2003; Velez *et al.* 2002). Among the variety of non-potable water reuse projects, agricultural and landscape irrigation have received the most research evaluation and actual implementation (Kubo and Sugiki 1977; Page and Chang 1984; Shelef 1990; Shuval *et al.* 1986; Strauss and Blumenthal 1990; U.S. EPA 1981).

During the last quarter century, the benefits of wastewater reuse as a means of supplementing water resources have been recognized by most state legislatures in the United States, as well as by most of the countries in the European Union. Since the 1960s, intensive research efforts have provided valuable insight into health risks and reliable treatment design concepts for water reuse engineering.

In the Canadian Prairies, too, it has been acknowledged that there is considerable potential for effluent irrigation (Hogg *et al.* 2003). While some jurisdictions view effluent irrigation as a means of wastewater disposal, others view effluent as a resource for economic development such as cash crop fertigation and golf course irrigation. Treated wastewater reuse is a well-established practice in western Canada where approximately 65 projects irrigating a total of 5700 ha (Alberta - 3050 ha; Saskatchewan - 2620 ha; Manitoba - 53 ha) have been established (Hogg et al. 2003). These projects, however, account for less than 5% of the total discharge of effluent on the prairies. Potentially 115,000 hectares could be irrigated if the practice were to be expanded (Hogg *et al.* 2003). Forage crops are favoured for treated wastewater irrigation because of their long growing season, high evapotranspiration demand and their ability to remove large quantities of nutrients from the biosystem.

At the Agricultural and Agri-Food Canada research facility in Lethbridge, Alberta, scientists have studied the use of wastewater for irrigation (Agriculture Canada 2001). Municipal sewage effluent applied to forage crops and supplemented with nitrogen fertilizer, proved to be a satisfactory source of nutrients for reed canarygrass, bromegrass, tall wheatgrass and Altai wildrye. Alfalfa, because of its nitrogen-fixing ability, did not require fertilizer. Potentially harmful bacteria in the wastewater were killed within 4 days of exposure to bright sunlight; within 2 weeks no risk of contamination remained for livestock consuming forage or for humans

working on the land. This practice for the use and disposal of wastewater has been adopted by more than 25 municipalities and 30 agricultural industries (Agriculture Canada 2001).

In the late 1960s, the Federal-Provincial Okanogan Water Basin Study concluded that phosphorus from sewage treatment plants discharging into Okanogan Lake was a major cause of the proliferation of aquatic weeds in the lake. The City of Vernon, B.C., embarked on a project to reclaim its wastewater by using it to irrigate farmland adjacent to the city. After a 6 year pilot project, a full-scale system was put into operation in 1977. Since 1977, the irrigated land base has been continuously expanded to meet the increased wastewater flows. All the reclaimed water generated has been used beneficially for irrigation, except for three instances when the storage capacity of the reservoir was exceeded.

In Saskatchewan, there are three major centers, Swift Current, Moose Jaw and Lloydminster, and 28 smaller communities which conduct effluent irrigation (Cameron and Crosson 1994). A project was initiated as part of the Irrigation Sustainability component of the Canada-Saskatchewan Agriculture Green Plan Agreement (CSAGPA) to evaluate the long-term impact and sustainability of effluent irrigation practices in Saskatchewan. As part of that study a comprehensive literature review including a review of international criteria was completed (Cameron 1996 and 1997).

The Moose Jaw project was started in 1982. Approximately 1194 ha of agricultural land are irrigated with treated wastewater. Nineteen center pivots and gated pipes are used. Forage, cereal and oilseed crops are grown. An hydrogeological study identified a shallow drift and deep bedrock aquifer underlying the irrigation site. Aquifer deterioration was predicted to occur from downward migration of the high nitrate content effluent leachate (Menely 1975). A laboratory soil column study indicated that a 25% leaching was required to prevent soil productivity reduction due to salinity buildup from the high soluble salt content of the effluent (DeJong 1976). The Moose Jaw effluent had an average electrical conductivity (EC) of 1.69 dS m^{-1} and an average total dissolved solids (TDS) level of 1238 mg l^{-1}. The effluent had high levels of ammonium, nitrate nitrogen, total phosphorus and soluble phosphate. Heavy metals and trace element concentrations were low in the effluent. The moderate sodium adsorption ratio (SAR) level of 4 was not considered to be problematic. The surface soils of the irrigation site are predominantly loamy sand and there have been no reported permeability problems. Average salt levels have increased in the irrigated soil (EC values increasing from 0.75 dS m^{-1} to 1.60 dS m^{-1}).

Shallow ground water quality data from 1981 to 1989 indicate no effect on ground water quality upstream from the irrigated area. Entry of effluent

into the groundwater within the project area, however, has resulted in increased concentrations of sodium, chloride, sulfate and bicarbonate. The deep aquifer appears to be unaffected. Nitrate-nitrogen levels varied from 0.03 - 33 mg l^{-1} in the groundwater samples and phosphorus levels ranged from 0.07 - 0.44 mg l^{-1}. Outward migration of salts was detected in piezometers indicating that lateral migration of soluble ions is occurring. There is no evidence of contamination of groundwater with infectious viruses or bacteria.

The Swift Current site began in 1973 as a pilot project conducted by the Agriculture and Agri-Food Canada Research Station (Jame *et al.* 1984). A full-scale project was initiated in 1978 using a total of 338 ha. Effluent is supplied from a secondary lagoon to 3 center pivots, 11 laterals, 2 volume guns and 3 hand-move sprinkler systems (Clifton Associates Ltd. 1993). The City of Swift Current initiated groundwater monitoring of wells and springs in 1976. Both a shallow drift aquifer and a deep bedrock aquifer are monitored.

The effluent has a high salt load with a mean EC of 2.6 dS m^{-1}. Preliminary results indicated that a leaching fraction of 10 - 15% was needed to ensure sufficient leaching to maintain salt content in the root zone below deleterious levels. After 8 years of effluent irrigation, steady-state soil salinity profiles developed, approaching the salinity of the effluent. Beginning in June of 1995 Sask Water has conducted an electromagnetic survey (EM 38) of the irrigated lands in the project area which also indicates that the soil salinity levels have risen to levels found in the effluent.

Changes in the shallow groundwater quality from 1978 to 1991 displayed increases in chloride, hardness, sodium, magnesium and total dissolved solids (Clifton Associates Ltd. 1993). Values for sulfate in one well were 414 mg l^{-1} indicating contamination by effluent applications. There has been no observed change in water quality for the deep bedrock aquifer. Groundwater bacteriology has found faecal coliforms present at greater than 30 most probable number (MPN) in the shallow wells. These observations contradict the pilot project study (Biederbeck and Bole 1979b).

The Northminster Effluent Irrigation Project is located approximately 11 kilometers north of Lloydminster and began operation in 1989. The project stores effluent received from the City of Lloydminster in a reservoir. The effluent is pumped to ten individual parcels of land through pressurized pipelines. One additional parcel receives effluent directly from the City's discharge line. The effluent is used to irrigate forage and annual crops. Soil salinity and trace metal monitoring have shown that soil salinity of the irrigated lands has increased marginally. These increases were in sodium, chloride and sulphate. The effluent has an EC of 1.6 dS m^{-1} and an moderate

SAR of 3.3. Expected increases in EC and SAR have been observed on the irrigated sites. Abnormally low precipitation in recent years has limited leaching. Water quality analysis of samples from most of the piezometers has shown some increase in nutrient concentrations, however it is not apparent if this increase is from the effluent supply or from fertilization. Major ion analysis suggests that there is little change over the background levels.

Roblin, Manitoba uses a lagoon to treat its residential sewage like many communities on the prairies. Typically, towns using this type of sewage system discharge effluent into local streams or rivers often during periods of high water flow. This was not an option for Roblin since they were prohibited from discharging sewage effluent into the nearby Shell River.

In January 1996 Roblin purchased 80 acres of land next to its lagoon system of which 40 acres is used for wetland and 20 acres for a poplar plantation. By the summer of 2001 the wetland was fully operational and complements the irrigation system. A total of 12,500 hybrid poplar trees were planted around the wetland and these can act as an additional user of wastewater in high precipitation years. Roblin won a 2002 FCM-CH2M Hill Sustainable Community Award for its wetland project. It was noted that salt accumulation on irrigated land has become a problem over time (Boddy 2003).

In March of 1993, a workshop entitled "A Vision for Water Quality in the Clear Lake Basin" identified the principal pollution related threats to water quality in the Clear Lake watershed. Among these were sewage disposal systems and particularly the Wasagaming Lagoons/Ominnik Marsh System (Figure 1b). Of specific concern was suspected leakage from the forcemain and lagoon cells and the effectiveness of the marsh to absorb sewage effluent discharged from the lagoon system.

A three-year (1999-2002) performance evaluation of the Wasagaming lagoons/Ominnik Marsh system followed. Highlights of the unpublished report include: the lagoon cells contained the required motile green algae essential to the oxidative degradation of the wastes and the minimization of odour problems. There is minimal sludge buildup over many years of operation in a cold climate due to fungal bulking of sludge in cell 1. Final nutrient polishing is accomplished by submerged aquatic plants which contribute through their photosynthetic activity super-saturation with oxygen in cell 3 during summer daylight hours, resulting in no problems in the effluent with unionized ammonia which is extremely toxic to aquatic biota. Cell 3 also develops a very rich population of invertebrates indicating that the polished effluent does not present toxicity problems for aquatic organisms. The polished effluent still contains some nutrients and these

have the potential to contribute to eutrophication in Ominnik Marsh and by through flow to Clear Lake.

Belke and McGinn (2003) carried out measurements of a number of physical and chemical parameters at various points in the Ominnik Marsh system (Figure 1b). The study found support for the leaking forcemain hypothesis. Other observations were: that there was effective uptake by marsh vegetation of nutrients released during the spring freshet. That a significant area of marsh was being short-circuited during the annual lagoon discharge release in June and that during this release significant concentrations of sediment bonded phosphorus were being released by discharge agitation. Following this report and on-going evaluation by Parks Canada and their consultants the decision was made to relocate the forcemain so as to bypass the marsh. Consultant engineers also examined the issue of upgrades to the sewage system to avoid the addition of nutrients to Ominnik Marsh and eventually to Clear Lake. The proposed changes included a sand filtration system at the exit to lagoon cell 3 (discharge channel) added aeration and the prevention of any leakage from the lagoons cells. Estimated costs might exceed $4.5 million (Stantec 2003).

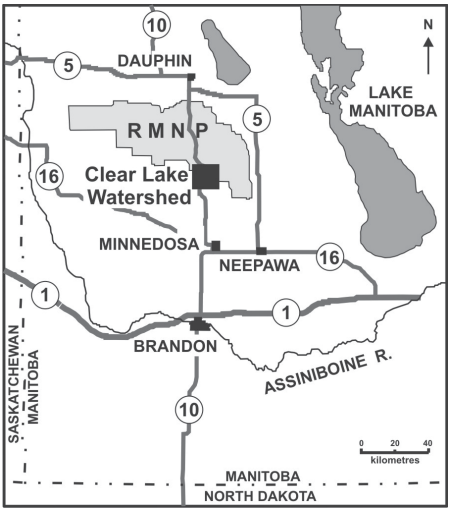

Figure 1a: *General location of the town of Wasagaming and the Clear Lake watershed.*

Objectives of the Study

The objective of this study is to assess the feasibility of fertigating hayland with treated (polished) sewage effluent as more cost efficient means of avoiding additional nutrient enrichment of Ominnik Marsh, South Lake and Clear Lake.

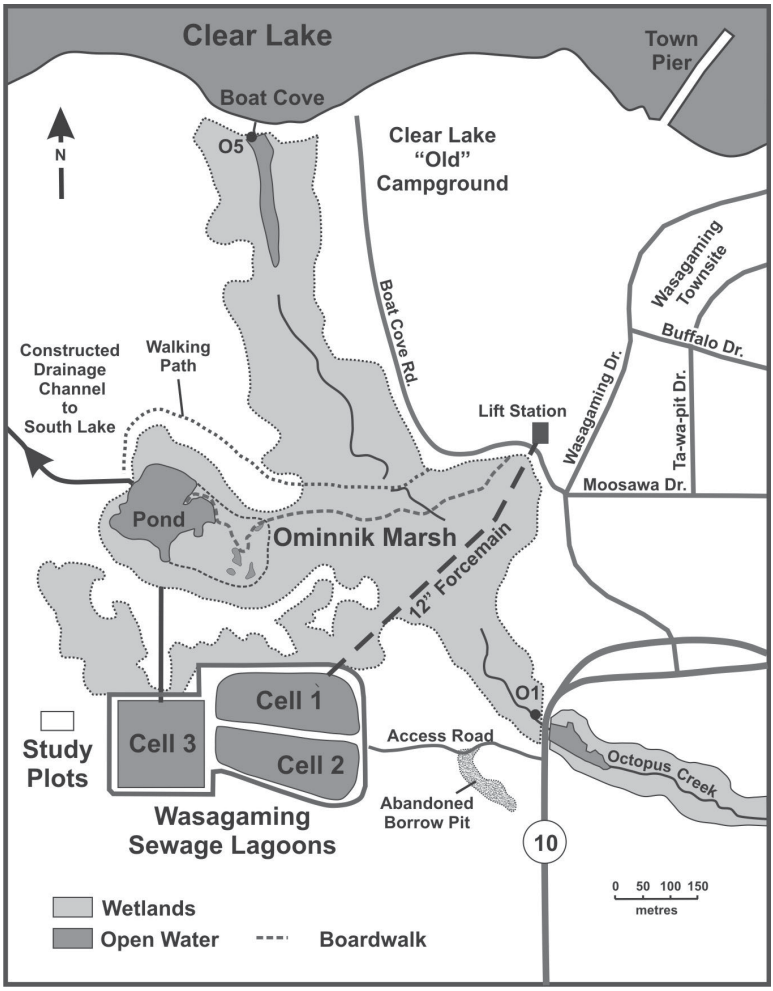

Figure 1b: *The Wasagaming Lagoons/Ominnik Marsh wastewater treatment system.*

Procedures and Methodology

Location of selected study plots:

To the west and adjacent to the Wasagaming lagoons are two parcels (19.8 ha and 13.7 ha) of non-gazetted hayland (Figures 1b and 2). The land has no present use, although in the past it had been harvested to provide forage for the livestock. A 30 m by 60 m study area was selected from the

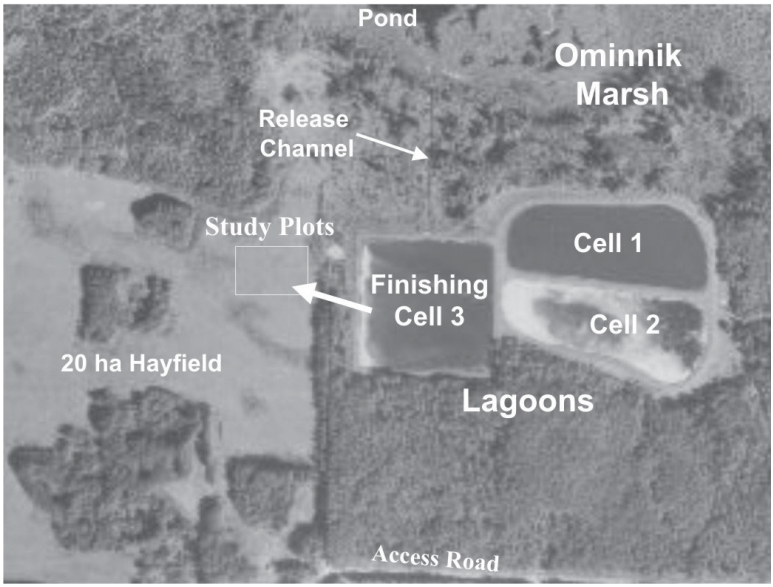

Figure 2: *Aerial photograph of the Wasagaming sewage treatment lagoons and the Hayfield study plots.*

larger hayfield and subdivided into 54 sample plots (Figure 3)**.** Each sample plot is 5 m by 5 m. All of study plots were within 300 m of the finishing lagoon cell 3.

Soils:

A 7.59 "Geoprobe" core was extracted from the west end of the study plot. The uppermost 2.72 m contains the Rackham Fine Sandy Loam, underlain by the medium sand glaciolacustrine parent material. Wet (saturated) fine to medium sands with occasional silt layers are found between 2.72 m and approximately 5.0 m below the surface. These glaciolacustrine complexes overlay an additional 2.5 m of deep-water rhythmiticly bedded fine sands and massive silt/clay. A fluctuating water table is estimated to lie between 2 and 4 m below surface, depending on annual precipitation.

A soil pit, approximately 1 m by 1.5 m by 1.5 m depth, exposed the Rackham Fine Sandy Loan soil profile and verified that the water table was deeper than 2.0 m below the surface. Four samples from the A-horizon (16 cm deep) were extracted every 2.5 cm. A fifth soil sample was taken at 30 cm depth in the B-horizon. All samples were tested for organic carbon (loss on ignition analysis, Oliver 2000).

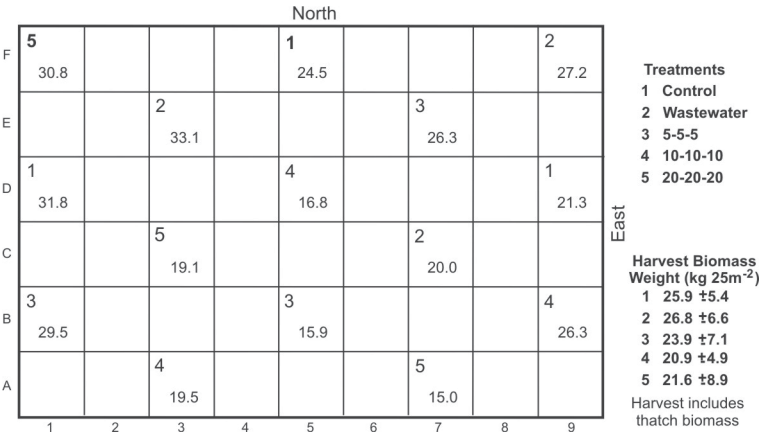

Figure 3a: *Hayfield study plots: biomass harvest September 23-30, 2003.*

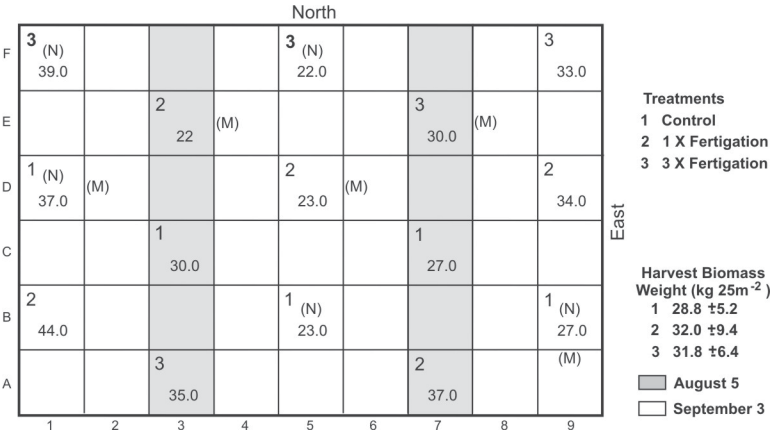

Figure 3b: *Hayfield study plots: biomass harvest August 5 and September 3, 2004.*

The Rackham Fine Sandy Loam is a Grey Wooded Soil, developed on medium texture glacial lacustrine sediments. The soil is considered to be friable, well drained and of moderate to high natural fertility (Ehrlich *et al*. 1956). The soil has been placed in the SCS hydrological soil group "A"; low overlandflow potential, high infiltration capacity, and a saturated hydraulic conductivity > 7.6 mm h^{-1} (Aho 1997). Organic carbon is estimated to be approximately 6% (Appendix 4). There is medium to low available nitrogen and phosphorus and good moisture retention. These soils are recommended for hay and controlled grazing and "Grass and

legumes will produce well, especially when nutrient deficiencies are offset by nutrient application." (Ehrlich *et al*. 1956).

Vegetation:

The predominant forage present was brome grass (*Bromus inermis*), with lesser amounts of quack grass (*Agropyron repens*) and Kentucky blue grass (*Poa pratensis* and *Poa sp.*). No toxic species were present and no rare or endangered species were observed in the 30m by 60 m study area.

The 2003 Study

Treatments:

Five irrigation treatments were tested on 15 randomly stratified plots (Figure 3a). Three sample plots each were irrigated with lagoon-polished effluent (2); 5-5-5 NPK fertilizer (3); 10-10-10 NPK fertilizer (4); 20-20-20 NPK fertilizer (5) and three plots were left as a control (1) (Figure 3a). All plots were colour flagged and the wastewater (effluent) irrigation was carried as a one-time application on June 10, 2003. The effluent was pumped from lagoon cell 3 by fire hose and sprayed on to the selected plots. The volume of wastewater applied (the emptying of lagoon cell 3) was determined by dividing the total volume of cell 3 (27,600 m^3) by the total irrigable land available (334,670 m^2), giving an equivalent depth of effluent (0.082 m) required for each 25m^2 plot. The delivery rate of the pump and fire hose system was derived from determining the time to fill a 5-gallon pail (22.7 l) and then calculating the delivery time (8 minutes and 12 seconds) required to apply the desired depth of water. The NPK fertilizer plots were irrigated with an equivalent depth of fertilized water on June 11 and 12.

The 2004 Study

On June 9, 2004 five of the 2003 sample plots were fertigated with 3 times the fertigation volume (3) applied in 2003 (Fig 3b). Similarly, five sample plots received a one-time effluent fertigation treatment (2) and the remaining five 2003 sample plots were designated control (1) (Figure 3b). The five-plot sub-samples selected had, in the 2003 season, undergone one of five 2003 treatments. That is, application of one time polished effluent; 5-5-5 NPK fertilizer; 10-10-10 NPK fertilizer; 20-20-20 NPK fertilizer and control, respectively.

Sampling and Testing:

In 2003 and 2004 effluent samples were collected prior to fertigation and the annual release. Enviro.Test Laboratories of Winnipeg provided all sampling bottles reagents etcetera. Replicate analyses were carried out for elemental composition, microtox bioassay, phenols and other trace organics of potential concern in sewage effluents. September 3 2003, samples of Coons tail (*Ceratophyllum demersum L.*) the predominant plant in lagoon cell 3 were also collected, dried at 80 degrees Celsius and digested in 3 ml of sulphuric acid in Kjeldahl flasks. The digests were cleared dropwise with hydrogen peroxide and diluted to 100 ml with deionized water for elemental analysis. Chemical analyses indicate total phosphorus content of 23 mg P g^{-1} dry weight; Total Kjeldahl Nitrogen of 875 mg N g-1 dry weight (Appendix 5).

Maintenance:

The study plots were checked on a weekly basis for vandalism or other problems. The plots were also examined from time to time during the summer to determine the major plant materials present.

Harvest 2003:

On September 23, 2003, 6 plots were harvested before rain stopped work. The remaining 9 plots were harvested on September 30, 2003. A large tarp and spring balance were used to weigh the freshly cut forage.

Soil Analysis 2004:

Prior to fertigation, on May 5, 2004, soil core samples (15-20 cm deep) were extracted from five plot boundaries; two associated with a one-times application, two outside control plots and one sample adjacent to a three-times application plot. Similarly, on November 4, 2004, post application and the growing season, soil samples were extracted from the five sample plots that experienced fertigation applications: three from three-times application and two from control plots. All soil samples were analyzed for pH, electrical conductivity, total phosphorus, potassium, ammonium, nitrite and total Kjeldahl nitrogen.

Harvest 2004:

In 2004 the seven sample plots were “early” harvested on August 5 2004; two plots each of control and three-times application (3X) and three one-time application (1X) plots. On September 3, 2004 the remaining eight plots were harvested. The “green” harvest biomass was collected into a large tarp and weighed on a spring balance to the nearest kilogram.

Forage Analysis 2004:

Biomass yields were sampled and analyzed for total phosphorus, total Kjeldahl nitrogen and crude protein. In addition the samples were sent to Norwest Laboratories in Winnipeg for Near Infrared Reflectance Spectroscopy (NIRS) analysis; including fiber, crude protein, mineral content and relative feed value.

Results

Two weeks prior to the 2003 and 2004 discharge into Ominnik Marsh the effluent in lagoon cell 3 was tested by Parks Canada and found to meet license requirements for discharge, specifically, biological oxygen demand five day test (BOD5) and soluble solids were less than 25 mg l^{-1}; faecal coliforms less than 200 colony forming units (CFU) 100 ml^{-1} and total coliforms less than 1500 CFU 100ml^{-1}.

The 2003 inorganic chemical analysis of the effluent (Appendix 1) indicates that concentrations of heavy metals or other elements identified as an irrigation, surface or drinking water concern in Manitoba fall below the provincial guidelines (Williamson 2001). The wastewater, however, contains the macronutrients, nitrogen, phosphorus and potassium and the intermediate nutrients calcium, magnesium and sulphur and the micronutrients, boron, copper, iron, manganese and molybdenum (Appendix 1).

There are no trace organics present at levels above the detection limit (Appendix 2). Phenols were present in the wastewater but at extremely low levels, 0.005 mg l^{-1}, just above the limits of detection (0.002 mg l^{-1}).

The pH of the effluent was 7.1 and the electrical conductivity 410 mS cm^{-1}. The total phosphorus concentration was recorded to be 1.5 mg l^{-1} with a soluble phosphate concentration of 0.52 mg l^{-1}. Total Kjeldahl nitrogen was 5.2 mg l^{-1}. The Sodium Adsorption Ratio (SAR) was calculated to be 0.67 (Appendix 3).

Microtox bioassay tests found no toxicity to the test bacterium, *Vibrio fisheri* present when the effluent pH was adjusted to the test pH of 8.5. Slight toxicity to the bacterium was detected in the non-adjusted pH sample (8.91). May/June 1999-2004 coliform tests for lagoon cell 3 have never exceeded 10 CFU 100 ml^{-1} for faecal coliforms and 50 CFU 100 ml^{-1} for total coliforms. Although a detailed analysis was not conducted in 2004 there is no reason to assume that the results would vary significantly.

Biomass Yields:

2003: Biomass yields ranged from 15.0 kg $25m^{-2}$ to 31.8 kg $25m^{-2}$, including undergrowth of residual thatch. The greatest productivity was associated with a one-time fertigation application (a mean value of 26.8 kg $25m^{-2} \pm 6.6$). The 10-10-10 application resulted in the lowest biomass yield (20.9 kg $25m^{-2} \pm 4.9$). Control plots produced the second highest yields (25.9 $25m^{-2} \pm 5.4$). However, there was no significant difference in the mean yields regardless of fertigation application (Figure 3a).

2004: Biomass yields ranged from 23 kg $25m^{-2}$ to 44 kg $25m^{-2}$. In 2004, there was no undergrowth of thatch as that had been collected in the 2003 harvest. The greatest productivity was associated with a one-time application (a mean value of 32.0 kg $25m^{-2} \pm 9.4$). Control plots produced the lowest yields (28.8 $25m^{-2} \pm 5.2$). However as in the 2003 study, there was no significant difference in the mean yields regardless of fertigation application (Figure 3b).

Soil Analysis:

The soil samples extracted on May 5, 2004 from the outer edge of the study plots (M on Figure3b) indicate that there is no significant difference in the physical and chemical parameters between pre-fertigation study plots designated as control, one-times fertigation and three-times fertigation (Table 1). Generally, total phosphorus (TP) and total Kjeldahl nitrogen (TKN) ion concentrations increase with depth. Potassium (K) ion concentrations decrease with depth.

The post fertigation soil samples collected November 4, 2004 (N on Figure 3b) from within study plots recorded parameter values similar to those measured in the pre-fertigation soil samples (Table 1). Generally, the Racham soil within the study control and three-times fertigation plots indicated a slight increase in total phosphorus, potassium ion concentration decrease with depth. Total Kjeldahl nitrogen arguably increases with depth. It is interesting to note that the slight increase in nutrient concentrations in the control plots post fertigation was actually greater than the nutrient increases in the three-times fertigation plots (Table 1; D1, B5, B9 vs. F1, F5).

Forage Analysis:

Table 2 summarizes the bulk forage analysis for total phosphorus (TP), total Kjeldahl nitrogen (TKN) and crude protein. Estimated nutrient values per kilogram biomass are relatively low, averaging 1.77 g kg^{-1} TP, 50.49 g kg^{-1} TKN and 30.7 % kg^{-1} of crude protein regardless of treatment. There was no significant difference in nutrient values among the treatments.

Table 1:

2004 RACKHAM FINE SANDY LOAM ANALYSIS

Date	Study Plot	Treatment	Sample Depth	pH	Conductivity (S cm^{-1})	TP ($mg\ g^{-1}$)	K (ppm)	TKN ($mg\ g^{-1}$)
05-May-04	D1	Control	1-5 cm	6.4	270	0.000	13	105
			5-10 cm	6.5	190	0.012	8	160
			10-15 cm	6.7	200	0.076	7	8
			25-20 cm	7.0	210	0.120	7	125
05-May-04	B9	Control	1-5 cm	5.6	420	0.000	15	175
			5-10 cm	6.2	180	0.000	7	175
			10-15 cm	6.5	110	0.024	9	159
			25-20 cm	6.7	90	0.080	7	
05-May-04	E3	1 X	1-5 cm	6.9	270	0.360	10	158
			5-10 cm	6.9	200	0.104	7	175
			10-15 cm	7.2	150	0.480	7	173
			25-20 cm					
05-May-04	D5	1X	1-5 cm	6.9	390	0.040	14	113
			5-10 cm	7.2	320	0.132	10	17
			10-15 cm	7.1	160	0.008	8	175
			25-20 cm	7.1	180	0.000	7	175
05-May-04	E7	3X	1-5 cm	6.0	370	0.020	12	175
			5-10 cm	5.8	180	0.040	8	141
			10-15 cm	6.0	190	0.000	10	12
			25-20 cm	6.3	140	0.000	5	5
04-Nov-04	D1	Control	1-5 cm	5.8	160	0.080	9	96
			5-10 cm	6.1	370	0.120	10	175
			10-15 cm	6.0	100	0.000	8	175
			25-20 cm					
04-Nov-04	B5	Control	1-5 cm	5.8	330	0.100	14	175
			5-10 cm	6.2	230	0.000	10	151
			10-15 cm	6.1	150	0.000	7	175
			25-20 cm					
04-Nov-04	B9	Control	1-5 cm	9.6	350	0.080	11	113
			5-10 cm	5.6	170	0.000	10	15
			10-15 cm	6.1	110	0.000	8	129
			25-20 cm					132
04-Nov-04	F1	3X	1-5 cm	6.7	300	0.000	10	105
			5-10 cm	6.4	260	0.000	10	175
			10-15 cm	6.9	200	0.080	7	175
			25-20 cm					
04-Nov-04	F5	3X	1-5 cm	7.1	280	0.200	13	148
			5-10 cm	6.8	350	0.000	25	175
			10-15 cm	6.5	190	0.000	5	88
			25-20 cm					

Table 2:

BULK FORAGE ANALYSIS

Date	Study Plot	Treatment	Bulk Weight (kg)	TP (g kg^{-1})	TKN (g kg^{-1})	Crude Protein (% kg^{-1})
5-Aug-04	3a	3X	35	3.30	68.9	43.1
5-Aug-04	3c	Control	30	2.40	51.2	31.9
5-Aug-04	3e	1X	22			
5-Aug-04	7a	1X	37	1.90	28.1	17.6
5-Aug-04	7c	Control	27	3.37	54.1	33.8
5-Aug-04	7e	3X	30	0.58	38.8	24.2
3-Sep-04	1b	1X	44	0.92	52.3	37.7
3-Sep-04	1d	Control	37	2.35	49.1	30.6
3-Sep-04	1f	3X	39	1.37	61.4	38.3
3-Sep-04	5b	Control	23	1.05	40.0	25.0
3-Sep-04	5d	1X	23	1.13	57.0	35.6
3-Sep-04	5f	3X	22	1.62	34.0	21.3
3-Sep-04	9b	Control	27	2.10	51.9	32.4
3-Sep-04	9d	1X	34	1.93	64.6	40.4
3-Sep-04	9f	3X	33	1.50	55.7	34.8

NUTRIENT SUMMARY

Nutrient	TP (g kg^{-1})	TKN (g kg^{-1})	Crude Protein (% kg^{-1})
Control Mean	2.25	49.27	30.7
Standard Deviation	0.83	5.48	3.4
1X Mean	1.47	50.47	32.8
Standard Deviation	0.52	15.76	10.3
3X Mean	1.6	51.74	32.3
Standard Deviation	0.9	14.88	9.3
All Sample Mean	1.77	50.49	31.9
Standard Deviation	0.75	12.04	7.7

Table 3 summarizes the NIRS analysis of the 2004 Harvest biomass as livestock feed including fiber, protein and mineral content. Upon completion of the NIRS analysis samples are assigned a relative feed index value that ranges from Prime, 1 to 5. The one-time fertigation received a grade of 2; three-times fertigation and control plots were graded as 3.

Table 3:

2004 FORAGE ANALYSIS BY NIRS

Replicate Samples	1X	3X	Control
Moisture	7.60%	7.60%	7.50%
Dry Matter	92.40%	92.40%	92.50%
Crude Protein	9.80%	8.90%	8.40%
Acid Detergent Fibre	32.40%	33.50%	33.30%
Neutral Detergent Fibre	49.00%	52.10%	51.10%
Available Protein	9.70%	8.60%	8.00%
Digestible Protein	6.60%	6.00%	5.70%
Heat Damaged Protein	1.10%	1.10%	1.10%
Non Structural Carbohydrates	23.60%	21.40%	22.90%
TDN	56.90%	56.10%	56.30%
DE	2.51 Mcal kg^{-1}	2.47 Mcal kg^{-1}	2.48 Mcal kg^{-1}
NE/GAIN	0.63 Mcal kg^{-1}	0.59 Mcal kg^{-1}	0.60 Mcal kg^{-1}
NE/LACT	1.29 Mcal kg^{-1}	1.27 Mcal kg^{-1}	1.27 Mcal kg^{-1}
NE/MAINT	1.28 Mcal kg^{-1}	0.24 Mcal kg^{-1}	1.25 Mcal kg^{-1}
Ca	0.90%	0.77%	0.81%
P	0.16%	0.16%	0.15%
K	1.13%	1.09%	0.89%
Mg	0.22%	0.20%	0.22%
Relative Feed Value (RFV)	**108**	**100**	**102**
Hay Grade	**2**	**3**	**3**

(Stokes and Prosko, 1998)

HAY GRADES (RFV)

Prime	>150
1	125 - 150
2	103 - 124
3	87 - 102
4	75 - 86
5	< 75

Discussion

Water quality characterization is the first step in the evaluation of the biological and chemical safety of using reclaimed wastewater for forage irrigation. The inorganic chemical analysis of the 2003 and 2004 effluent indicated no problems with heavy metals or other elements identified as an irrigation, surface or drinking water concern in Manitoba. In this respect it is of interest to note that irrigation of pastures by treated and untreated sewage near Melbourne, Australia for more than a century was reported to

have increased heavy metal concentrations in the soil, but did not increase their concentrations in the herbage or in the animal tissues of animals grazed on these pastures (van de Graaf *et al.* 2002). There are no trace organics present at levels above the detection limit; consequently, there will be no problems for use of the forage by herbivores. Phenols are also present in the effluent at extremely low levels and are not a concern from a pollution perspective. The wastewater, however, contains the macronutrients, nitrogen, phosphorus and potassium, the intermediate nutrients calcium, magnesium and sulphur and the micronutrients, boron, copper, iron, manganese and molybdenum.

Salts in soil and/or water can reduce water availability to the crop to such an extent that yield can be affected and as such salinity can be a serious problem for long-term sustainability of a wastewater irrigation projects. A measure of salt content in water is its electrical conductivity (EC) and for irrigation purposes a value of greater than 1000 mS cm^{-1} can affect the growth and yield of the most sensitive species (Manitoba Agriculture 1999). Electrical conductivity values measured in the 2003 and 2004 effluent from lagoon cell 3 (410 mS cm^{-1}) suggest that salinity buildup will not be a problem and no restrictions are required. Some dissolved salts, however, are worse than others and the concentrations of certain elements in relationship to each other are important. For example, the relative proportion of sodium cations to other cations can give rise to soil permeability problems. Specific ion toxicities may arise with sodium levels exceed 70 mg l^{-1} and chloride levels are greater than 100 mg l^{-1} (Halliwell *et al.* 2001). Sodium Adsorption Ratio values below 4 are considered safe (Peterson, 1999) and the irrigation wastewater is significantly below this standard (0.67; Appendix 3) and therefore suitable for crop irrigation.

In order to transmit infectious disease the infectious agent must be present and in numbers adequate for the infection of an exposed and susceptible individual. Domestic sewage can be contaminated with any microbial agent that can enter the sewer. The number and types of pathogens present in untreated wastewater is a function of the infectious disease prevalence in the community from which the waste is derived. A series of stabilization ponds like those at Wasagaming are suggested by the World Health Organization to be the most effective means to reduce helminthes ova to one or less per liter and a faecal coliform number of 1,000 MPN per 100 ml (WHO, 1989). The levels of faecal and total coliforms are consistently below the provincial and US EPA guidelines for the irrigation of forage crops.

Concerns about impacts of municipal wastewater on the normal soil microflora in Jordan were assessed by Malkawi and Mohammad (2003).

The bacteriological analysis of all the soils at the end of the growing season found no difference in total aerobic bacteria counts suggesting that the use of wastewater did not stimulate or inhibit these microflora.

The soil in the lagoon and irrigation area is the Rackham Fine Sandy Loam and the excavated soil pit confirmed the typical profile. This soil is considered to be of moderately high natural fertility. The available nitrogen, phosphorus and potassium is medium to low, but the soils are friable and have good moisture retention capacity. Grass and legume crops will produce well on these soils, especially if the deficiencies in natural fertility are offset by nutrient application (Ehrlich *et al*. 1956). The soil, however, is not suited to arable agriculture and it is recommended that the Rackham Fine Sandy loam be used for hay and controlled grazing, forestry, and the preservation of wildlife. No indication of groundwater presence was found at 2 m from the surface.

The 2003 Trials:

The irrigation trials in 2003 indicated best forage production on the wastewater plots but the variability was high and the differences between the controls and wastewater treatments were not statistically significant (Figure 3a). The fertilizer treatments resulted in lower than average yields. Unfortunately the very dry growing season may have influenced the results obtained on all plots. It should also be noted that the harvested yields included significant thatch from previous years growth. Indeed, calculations made from the biomass yields to assess production per hectare indicate values several fold greater than the average tame hay yields reported by Manitoba Agriculture over the past 20 years (Manitoba Agriculture and Food 2002). No significant inhibitory effects of the wastewater on forage growth were found.

The total nutrients added to Ominnik marsh from the lagoon cell 3 discharge in the 2003 season was 153 kg of nitrogen and 38 kg of phosphorus. This quantity of nutrients if used to fertilize the 19.8 hectare parcel of hayland would provide approximately 7.5 kg of nitrogen and approximately 2 kg of phosphorus per hectare. If the 13.8 hectare parcel was used then the fertilization provided by the wastewater would be approximately 11 kg of nitrogen and approximately 2.7 kg of phosphorus. Both of these scenarios represent very low fertilization rates.

The 2004 Trials:

The 2004 fertigation trials examined the potential buildup of salts and nutrients in the Rackham Sandy Loam, forage quality and biomass harvest as a response to fertigation volume; specifically control plots, a one-time fertigation volume (1X) and a three-times fertigation volume (3X).

Pre and post fertigation soil analyses of the 1X and 3X effluent treatments were comparable with the controls, regardless of depth of samples taken and demonstrate that the long-term viability of the soil will not be affected by fertigation. Nitrates are of concern because of downward mobility in the soil and the potential impacts on groundwater, however in this study, recorded NO_2 – N concentrations were below the detection limits of the instruments. Total Kjeldahl nitrogen, a measure of total organic and inorganic nitrogen, was insignificant in terms of comparison between control plots and the 1X and 3X effluent treatment plots. Soil samples taken early and late in the growing season to indicate insignificant short and long-term effects on the Rackham Fine Sandy loam following fertigation.

The 2003 trials demonstrated that the lagoon cell #3 polished effluent was safe to use for fertigating hayland, but for quality assurance, an analysis of the nutrients in the forage was required. This study assayed various nutrient concentrations in the control and treatment vegetation: total phosphorus, total Kjeldahl nitrogen, and crude protein.

A comparison of forage from control, 1X effluent and 3X effluent treatments revealed that these nutrient concentrations were not present at levels which are cause for concern, nor are there significant differences between the treatments and control (Table 4).

Two harvest dates were established for the purposes of examining the potential of short-term nutrient accumulation in forage following fertigation. The forage analysis from mid-season and late-season harvest did not demonstrate cause for concern in terms of nutrient levels. An interesting observation following the mid-season harvest was that growth seemed to be encouraged as there was a healthy population of clover, which was established shortly after harvest. The potential to achieve two abundant crops of hay could be possible in a fertigation program, depending on how early in the season the first crop could be harvested.

The variation in crude protein content of the forage from control and treatment was insignificant (Tables 2 and 3). The percent crude protein ranged from 8.4% to 10.6%, with the highest content found in the 1X treatment forage. This is comparable with the percentage of protein typically found in prairie hay, which is 5% (Porteous 1979). The relative feed value, obtained from the NIRS analysis, was used to grade the forage from the control, 1X and 3X effluent treatments, grade 3, grade 2, and grade 3 respectively (Stokes and Protsko 1998)

The volume of forage produced was comparable between the treatment and control plots, however the 1X treatment plots produced the highest average yield. The economic value of a production system such as this can be established by examining the overall yield. The biomass from the

study can be compared with 2002 statistics from Manitoba Agriculture regarding average hay production (Manitoba Agriculture and Food 2003). From 1962-2002, tame hay production values were 3,899.3 kg ha^{-1}, whereas the 2004 trials produced an average of 2,677.51 kg ha^{-1}. The value of hay is approximately 6.6 cents kg^{-1}, which would mean the total biomass, would be worth \$180.00 ha^{-1}. The entire area available for hay fertigation would therefore return about \$4,300 per year in forage production.

Conclusions

A preliminary assessment of the feasibility of using polished effluent from the Wasagaming sewage lagoon system was carried out in 2003. Data gathered on effluent chemistry and toxicology support the reuse of this wastewater in an ecologically sustainable manner.

In the second year (2004):

a. The biomass harvests of a 3-fold increase in the volume of wastewater per unit area were compared to the 1-fold wastewater fertigation per unit area (the 2003 application rate) and zero fertigation (controls).
b. Pre and post fertigation soil sample were used to assess the cumulative and or negative impacts on soil chemistry, fertility and other physical properties and the potential for nitrite contamination of groundwater was examined.
c. Forage biomass was assessed for toxicology, nutritional quality and commercial value in each replicated treatment both in an early and late harvest.

The 3-fold application of wastewater effluent resulted in no significant increase in yield or quality. Soil chemistry and fertility showed no significant differences between fertigated plots and the control plots. There was no indication of nitrite or phosphorus buildup or leaching. Forage yields were consistent in biomass and nutritional quality. There were no significant differences between fertigated yields and the control yields.

The results of this study provide additional support for the use of lagoon wastewater for fertigating hayland in a sustainable irrigation program for the Town of Wasagaming, Riding Mountain National Park.

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Appendix 1

Effluent Analysis (Enviro.Test Laboratories)

Inorganics	Concentration	Manitoba Water Quality Guideline (Williamson, 2001)
Aluminum	0.42 mg l^{-1}	5.0 mg l^{-1}
Antimony	0.001 mg l^{-1}	none
Arsenic	0.0029 mg l^{-1}	0.1 mg l^{-1}
Barium	0.0466 mg l^{-1}	none
Beryllium	< 0.001 mg l^{-1}	0.1 mg l^{-1}
Bismuth	< 0.0001 mg l^{-1}	none
Boron	0.14 mg l^{-1}	0.5 - 0.6 mg l^{-1}
Cadmium	< 0.0002 mg l^{-1}	0.0051 mg l^{-1}
Calcium	44.8 mg l^{-1}	none
Cesium	< 0.0001 mg l^{-1}	none
Chromium	0.002 mg l^{-1}	none
Cobalt	0.0004 mg l^{-1}	0.05 mg l^{-1}
Copper	0.001 mg l^{-1}	0.2 – 1.0 mg l^{-1}
Iron	0.25 mg l^{-1}	5.0 mg l^{-1}
Lead	0.0007 mg l^{-1}	0.2 mg l^{-1}
Lithium	0.03 mg l^{-1}	2.5 mg l^{-1}
Magnesium	35.9 mg l^{-1}	none
Manganese	0.0239 mg l^{-1}	0.2 mg l^{-1}
Mercury	< 0.0003 mg l^{-1}	none
Molybdenum	0.0022 mg l^{-1}	0.01 - 0.05 mg l^{-1}
Nickel	< 0.002 mg l^{-1}	0.2 mg l^{-}
Phosphorus	1.15 mg l^{-1}	0.05 mg l^{-1}
Potassium	10.4 mg l^{-1}	none
Rubidium	0.0062 mg l^{-1}	none
Selenium	0.002 mg l^{-1}	0.02 - 0.05 mg l^{-1}
Silver	< 0.001 mg l^{-1}	none
Sodium	25 mg l^{-1}	none
Strontium	0.168 mg l^{-1}	none
Tellurium	< 0.001 mg l^{-1}	none
Thallium	< 0.001 mg l^{-1}	none
Tin	< 0.0005 mg l^{-1}	none
Titanium	0.0073 mg l^{-1}	none
Zinc	< 0.01 mg l^{-1}	1.0 - 5.0 mg l^{-1}
Uranium	0.0023 mg l^{-1}	0.01 mg l^{-1}
Vanadium	0.002 mg l^{-1}	0.1mg l^{-1}

Appendix 2

Trace Organics (Enviro.Test Laboratories)

All of the following potential pollutants were below the level of detection:

1-Methyl Naphthalene	2-Methyl Naphthalene
Acenaphene	Acenaphthylene
Anthracene	Benzene
Benzo (a) Anthracene	Benzo (a) Pyrene
Benzo (b) Fluoranthene	Benzo (g h i) Perylene
Benzo (k) Fluoranthene	Chrysene
Dibenzo (a h) Anthracene	Ethyl Benzene
Extractable Hydrocarbons (<100 µg l^{-1})	Fluoranthene
Fluorene	Indeno (1 2 3 cd) Pyrene
Naphthalene	Pentochlorophenol
Phenanthrene	Pyrene
Toluene	Volatile Hydrocarbons
Xylene (meta and para)	Xylene (ortho)
Xylene total.	

Appendix 3

Sodium Adsorption Ratio

The concentrations of calcium (Ca), magnesium (Mg), and Sodium (Na) were used to calculate the sodium adsorption ratio. Sodium Adsorption Ratio (SAR) describes the amount of excess sodium in relationship to calcium and magnesium.

$$SAR = \frac{0.043\ (Na)}{[0.025\ (Ca) + 0.04\ (Mg)]^{1/2}}$$

where the concentrations are in mg l^{-1}

$$SAR = \frac{0.043\ (25)}{[0.025\ (44.8) + 0.04\ (35.9)]^{1/2}}$$

$$SAR = \frac{1.075}{(2.556)^{1/2}} = 0.67$$

Appendix 4

Soil Analysis

Organic carbon content (LOI methodology, Oliver *et al*. 2000)

A1 6.6% (0.0 - 3.0 cm from surface)
A2 6.3% (4.0 - 7.0 cm from surface)
A3 5.7% (8.0 - 11.0 cm from surface)
A4 4.9% (12.0 - 15.0 cm from surface)

Mean 5.9% ± 0.8%

Appendix 5

Aquatic Plant Analysis (Coon's Tail) – September 9, 2003

Total Kjeldahl Nitrogen	875 mg N g^{-1} dry weight
Total Phosphorus	23 mg P g^{-1} dry weight

Thinking globally, acting locally: the London-based Hudson's Bay Company Governor's 1934 tour of its Canadian operations in the eastern Arctic

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Abstract: Drawing on film recordings, personal diaries and other materials deposited in the Hudson's Bay Company archives in Winnipeg, Canada, this paper examines an extended tour of the eastern Arctic in 1934 by Ashley Cooper, Governor of the Hudson's Bay Company, Director of the Bank of England and representative of His Majesty King George V. The paper offers interesting insights into the use of these forms of archival material for the study of the administration of Canada's northern territory, the trappings and symbols of power, perceptions and treatment of the native population and perspectives on the future prospects of the region. The records evoke the late imperial encounter with the exotic and the 'other'. They also demonstrate how global perspectives can be distorted or even rejected when trying to translate them into local policy.

Introduction

The 1930s were years of global economic turmoil and social instability. Partly as a result of this world-wide turbulence, the Hudson's Bay Company (HBC) - Canada's oldest and one of the world's most venerable corporate bodies - found itself (like many other companies at the time) in a state of crisis. By 1934, after convulsive changes in its management structure, the Company had weathered the worst of the storm, but was by no means restored to the profitability it had enjoyed in the previous decade. This paper deals with a limited part of the reconstructive process, focusing on

the activities of Governor Patrick Ashley Cooper in trying to improve the HBC's sullied reputation and the threat this posed to the wider, international financial picture. The paper also addresses the relationships between those global concerns and how they were translated into local action.

Our previous studies have been concerned with the Hudson Bay Company's place in the global economy during the early years of the twentieth century. The first of these highlighted the Company's linkages at the international scale through a preliminary examination of the interlocking directorships between its directors and other national and international firms, demonstrating that although the HBC was a force to be reckoned with within Canada, it appeared to be only a relatively minor player in the world economy (Selwood, 2000). The second paper, a comparative study using a broader sampling of British companies with international connections, reinforced this view in investigating more comprehensively just how complex and extensive were the business networks of the British corporate elite during the period (Brayshay *et al*., 2005). Our third paper explored the nature of these networks, examining the social, cultural and political characteristics of the corporate elite and how these were likely to have shaped their behaviour (Brayshay *et al*., 2006). The fourth paper zeroed in on Patrick Ashley Cooper, appointed Governor of the HBC in 1931 after a crisis of confidence in the corporate leadership (Brayshay *et al*., 2007). This latter paper examined Cooper's business associations in more detail, indicating that the HBC's policies were very much directed from London and linked with global policies through his position on the Bank of England's Board of Directors. It became clear that Cooper had been appointed Governor of the HBC as the Bank's representative in an effort to rescue the Company from the dire straits into which it had fallen. Furthermore, it revealed just how influential Cooper was in supporting and managing the business interests of the British Empire, including those of the HBC, showing the extent of his international travels and the exceptional range of his personal business connections. Within that global context, the current paper places Governor Cooper's activities under the microscope, as it were, in examining his work with the HBC during an extended and unprecedented inspection tour of the HBC's operations on Canada's north-eastern periphery undertaken in the summer of 1934.

The 1934 inspection tour is particularly significant for a variety of reasons. It was the first occasion since its founding in 1670 that a Governor of the HBC had actually ventured into the far north-eastern and most remote reaches of the Company's territory. Because of the importance of the tour, it was fully documented, through film, through photography, a book commissioned by the company, through Cooper's official

correspondence and his personal diary, in which he made copious notes of the journey. These records, all held in the Hudson's Bay Company Archives in the Provincial Archives of Manitoba, provide invaluable insights into the geography of the region, the native peoples, and its distinctive local economies.

The records highlight many of the difficulties of survival in the north, the extraordinary skills of the native population, their lifestyles and the impact of white intrusions into the territory. Although there were servants and administrators of the Canadian Government based in the north, they still relied almost entirely on the good offices of the HBC for transport into and out of the territory, for all essential supplies, and for support of their official functions. It thereby demonstrates the continuing importance of the Company's presence in Canada's north, indicating that, in many respects, even though the HBC gave up its exclusive territorial claims in Canada in 1870 (some 65 years earlier), the Company nonetheless still retained its 'sovereignty' well into the twentieth century. Canada's North was still more directly linked with the British Empire than it was to rule from Ottawa. However, a pivotal element of Cooper's task during his tour was both to maintain and reinforce the Company's commercial interests in the region, and to (re)assert its importance in Canada as the principal – symbolic and tangible - representative of the British Empire.

Three principal themes emerge within this paper. First, our study exemplifies the 'global' perspective of Empire and the broader issues involved in holding the 'family' together by incorporating all the symbols and trappings of power over the 'little brown people' on the Empire's outer periphery.[1] Second, there is the more mundane, but ultimately more critical, concern over commercial domination, wherein Cooper was dedicated to rescuing the Company's operations in Canada and its northern territory. This involved consideration of some of the micro-managerial aspects of the HBC's activities, showing how Cooper, the 'globally oriented' director, sought to influence the internal affairs of the Company on the margins of its operations and on the edge of Empire. Third, there is the North's impact on Cooper, which inevitably had some influence on his thinking. His observations were grounded not only in his wider, global experiences and knowledge, but also by his immediate exposure to the environment and people of the north country. Unquestionably, the Governor was deeply impressed by the work of some of the Company's officers working in the North, by the northern environment and its people, and by the attitudes of other influential personalities who were in a position to have an impact on HBC operations. The paper will show how dominant a role the Company played in the social economy of the North and how it was essentially an extension of the government and administration of the British Empire.

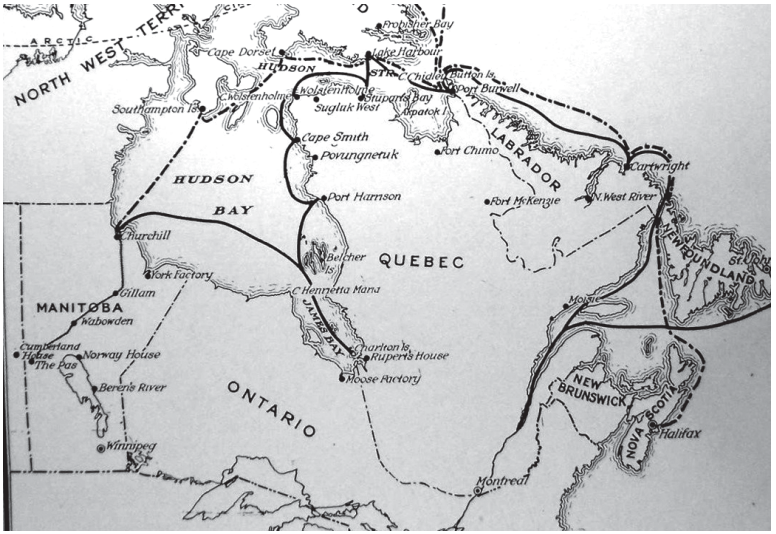

Figure 1: *Governor Cooper's itinerary.*

Indeed, second only to concerns about the Company's dire financial circumstances and what might be done to remedy the situation, the Governor's journey was deliberately designed and orchestrated to generate continued allegiance to the Crown.

The Symbolic Trappings of Empire

Cooper's tour provides a classic example of the relationships between Britain, its dominions and their subjects. It was replete with the pomp and circumstance associated with the British Crown, beginning with his ceremonial boarding of the Company's northern supply ship, the *Nascopie*, at its home port of Montreal on 7 July 1934, his leaving the ship at Churchill on 22 August, and his eventual departure from Canada for New York almost a month later (Cooper 'Diary' – hereinafter Cooper - 21 September) (Figure 1). Cooper was accompanied by his wife, Kathleen, a retinue of HBC staff, an official writer/recorder and a film production team. The ship's complement also included an archaeologist, an astronomer and an ornithologist, several other government personnel and RCMP officers.

Scenes from the film[2] show the governor being played aboard the *Nascopie* by a piper of the Canadian Black Watch 'in his full war paint' (Cooper, 7 July). He was waved off by a large crowd of well-wishers including

Figure 2: *The Governor being piped ashore .*

senior Canadian officials of the Company, government representatives, relatives and friends, and even 'two old pensioners with gold medals and two bars each'. (Cooper, 7 July). Each of the ship's ports of call was accorded similar ceremony. In anticipation of his arrival, Cooper insisted that the HBC flag should be flying at the mainmast of all of the Company's trading posts in announcement of his visit (Newman 1999, p. 294). R. H. H. Macaulay, commissioned to write the published account of the tour, records Governor Cooper and his party led ashore by the piper in full highland regalia at the posts (Figure 2); at Cartwright passing through a 'triumphal arch of evergreens and flags'; and at Moose Factory being greeted with volleys of gunfire and cannon and met with due solemnity by the local HBC post manager, servants and apprentices (Macaulay 1934, pp.22 and 66). To impress upon the resident native population that they were all part of the same 'family,' the local people were given a central role in the welcoming party, although they were obviously coached in how they were to participate. Cooper describes his arrival at Port Burwell (now Killiniq) at the entrance to Hudson Strait:

> . . . as we got near to the Post I suddenly heard plaintive music beginning. It was the sound of the Eskimos [*sic*] beginning to sing. . . . As we rounded the end of a big rock we saw the Eskimos drawn up in two lines, the men on the right and the women on the left, and to our intense surprise I found they were singing 'God Save the King'. We came to attention at a point between the two lines and waited until they finished. Then I walked up the line of men and K [Kathleen, Cooper's wife] up

> the line of women, shaking hands with them and saying: Auktional!'. We then crossed over and I shook hands with the women and K with the men' (Cooper, 26 July).

Macaulay (p. 34) adds: 'Every Eskimo head was bowed, and every pair of eyes was glued to a small piece of paper about three inches square

> . . . it was impossible to detect either tune or time in the slow and dismal dirge which came from their lips'.

Another critical component of the opening ceremonial was a reading of the King's message to his subjects, along with a speech by the Governor with translation, 'followed by a short reply by a native'(Cooper, 26 July). Typically, Cooper's speech began with an opening line in the local language: 'Koh vee ah shoo poonga ee lip see nik takoh gama' (i.e. 'I am very pleased to see you'); the remainder of the speech was thereafter delivered in English but translated for the onlookers by an interpreter:

> I then spoke to them telling them how glad I was to see them, but I was sorry that times had been bad with them; that in the White Man's country it had been worse, even to the point of starvation; that God had been good to them here by giving them fish and seals which they could catch; recommended them, when their immediate supply was provided, to trap so that they could trade with the Store and get better equipment for fishing, etc.; explained to them that, although *they* lived so far off, we had been determined to see them and now that I had seen them I was confident that they would work well and live happily one with another (Cooper, 23 July).

After this grand welcome, the natives 'were then dispersed until tomorrow,' 'sent off to their tents,' while the Governor spent time with the Company's officers and examining the Company's books. The 'little brown people' were later recalled for additional ceremonies including the exchange of gifts, entertainment, and demonstrations of their culture, lifestyles and skills.

The exchange of gifts and presentation of HBC awards were additional representations of the authority of the Company designed to cement the allegiances of both its servants and of the native population. Eligible HBC servants were awarded long-service medals, while post managers, clerks, police and missionaries received one of the Governor's specially struck, commemorative bronze medals[3] (Figure 3). Post managers were also given a framed photograph of the Governor and his wife, and a silver spoon from

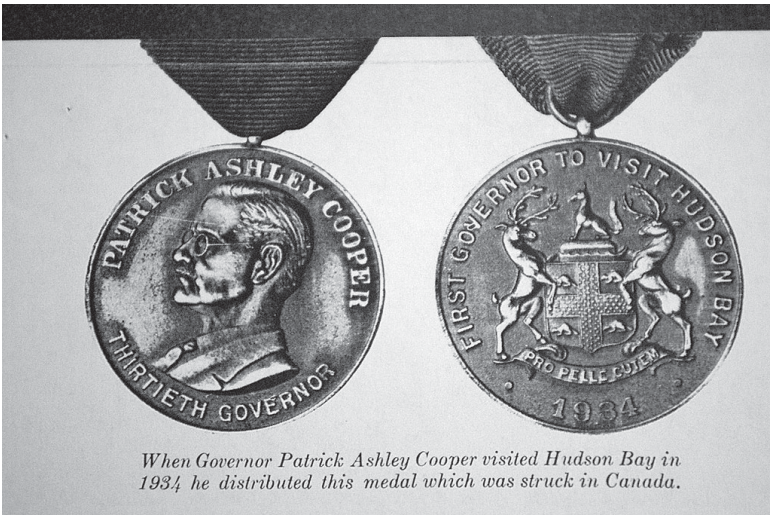

Figure 3: *Commemorative bronze medal featuring Governor Cooper.*

Mrs Cooper. Apprentices received a fountain pen (Cooper, 26 July). Then it was the natives' turn. They came forward to choose between a shirt or a pipe and tobacco. Cooper also handed them a message and a hunting knife inscribed on one side with the words 'be happy while you hunt' and on the obverse 'P. Ashley Cooper Gov. of the HBC 1934' (Newman 1991, p. 296). The women followed, with their choice being a print dress or woollen sweater, while Mrs Cooper 'gave each a folder containing a message and photograph of herself with her children' (Macaulay, 38) (Figure 4). Finally, children were given 'pocket knives, mouth organs, toques, beads and rattles, according to their sex and age' (Macaulay, p.39).

Wherever they went, as was the custom, the Governor and Mrs Cooper received gifts from the natives. For example, at Moose Factory, the Indian Chief presented Cooper with 'A beautiful deerskin cloth with the Co's coat of arms, dates etc. & the address of welcome on a birchbark scroll. And to K, an embroidered cloth, mocassins [*sic*] & a deerskin card case' (Cooper 8, August). At Rupert's House, 'the head man of the Indians then presented

> . . . a birchbark canoe and a black beaver' from the recently established beaver preserve (Cooper, 8 August).

Other more entertainment-oriented activities were also designed to build a sense of camaraderie at both global and local scales. A film provided by King George V showed clips of the 'Trooping of the Colour' ceremony

Figure 4: *The women receive gifts.*

and other symbols of imperial power. Cooper noted that the Eskimos were particularly 'interested in the soldiers marching in line and, amongst the naval pictures, a destroyer travelling at full speed'. However, they also 'loved the dog teams and the kayaks' featured in the film produced for the Company that showed local activities in its different regions (Cooper, 23 July).

Cooper experimented with the use of radio broadcasts to extend the range of his trip to encompass places omitted from the itinerary of the *Nascopie*. The transmissions incorporated music, messages from the King, and from the Governor (Cooper, 19 July). One of these broadcasts, a special one to be beamed to all posts, was however unsuccessful (Cooper, 10 August), and so was another attempt made a couple of days later (Cooper. 12 August). Apparently, the microphone amplifier had been deliberately unplugged on orders from Ottawa (Newman 1991, p.298).

Fireworks, dances, sports and games were additional elements of the celebrations (Figure 5). For example:

> . . . at Lake Harbour a whale boat race was arranged. Field sports included a tug of war, foot races and a 'grand scramble'. Thereafter all the natives came close up while we stood above them on the terrace, and they sang 'God Save the King' (Cooper, 26 July).

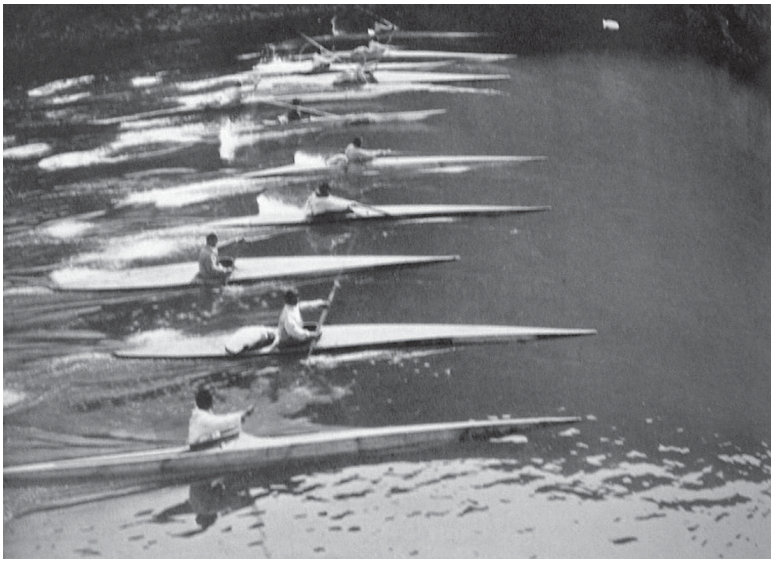

Figure 5: *The races, in kayaks and on foot.*

These activities were very reminiscent of an English country fête, with the Governor presiding in the role of the local squire. Relations with the natives were an interesting mixture of patronizing superiority and respect. On the one hand, they were treated as inferior subjects, regarded with some amusement because of their ignorance of 'modern' ways and technology. Yet, on the other hand, the visitors recognized that the natives demonstrated considerable skills and boasted some very admirable value systems. Cooper was particularly taken by the sharing of competition winnings with the less fortunate and the refusal of males to compete with women (Cooper, 23 July**).**

Another important symbol of the Company's real and lasting presence in northern Canada was the wreath-laying ceremony commemorating Henry Hudson's voyage more than three centuries earlier into the bay bearing his name. The ceremonial party included representatives of the Canadian government and the RCMP, but their presence in the Arctic was at best nominal and obviously dependent on the facilities afforded by the HBC (Cooper, 4 August). R. G. Madill, of the Dominion Observatory, was on the voyage to measure compass variations and to map the coastlines more accurately (Cooper, 15 July). Cooper certainly had a pretty low opinion of the Canadian government's presence in the North. Indeed, the governor described two of its representatives aboard the *Nascopie* as 'dreadful specimens' (Cooper, 17 July). Of one of the subjects of his disparagement - a doctor – Cooper noted that the only reason he had taken up a northern posting was that he had been unable to earn a living in the south. The other government official in the party, and target of Cooper's censure, was employed in the Canadian Post Office service and was going north for reasons 'too ridiculous to be believed' – that is, to take a census of the mail, almost all of which was handled through the HBC or the police posts. He was also going to 'swear in' new postmasters, who also doubled as the police force in certain posts, their 'post offices' consisting of the policemen's bedrooms (Cooper, 17 July). Clearly, in 1934, the Canadian government had only a token presence in the region.

Canada and Canadians' Impact on the Governor

In the first place, even though his journey occurred during the short summer months, Cooper was obviously extremely taken with the profoundly harsh grandeur of the Canadian environment. His journal is packed with vivid descriptions of the difficulties of navigation and human survival in Hudson Bay. For example, in recounting his shipboard

experiences in being icebound and lost in fog in Hudson Bay during mid-August, he records the *Nascopie*'s dismal progress as follows:

> At 11 o'clock this morning we suddenly came into open water, and travelled full speed for an hour; then back into heavy ice, but not heavy enough to prevent our going forward at a fair speed. In spite of this progress, our effort for the last three days has been: minus 30 miles. Three days ago we were 15 miles north of Cape Henrietta Maria. At noon today we were 15 miles south of it again . . . we shall have to make other plans' (Cooper, 13 August).

A week earlier, Cooper had already concluded that:

> If ever I had any doubts as to the impracticality of the port at Moosonee or the Churchill sea route, they have been dissipated. Here are we practically stuck and only able to proceed by forcing our way through ice. Even then the ship is rocking and jumping to the accompaniment of constant thunder of crashing ice. Any ship unprotected against ice could not proceed at all and in all probability would have been crushed a score of times (Cooper, 4 August).

Needless-to-say, the *Nascopie* had a properly reinforced, semi-circular hull and cut-away stem that had been designed to break through or ride over fairly heavy ice (Macaulay, p 31). But even a vessel of her strength and special adaptation was clearly tested severely by the ocean environment of the Bay. The ship's movements in ice are graphically and startlingly recorded at length in the official film of the journey (Figure 6).

References in the documentary evidence to the barren landscapes of the North occur on numerous occasions. However, Cooper also had an eye for any potential there might be for the production of vegetables and other foodstuffs that could provide supplements for the local diet. As he admitted, such possibilities were obviously limited, but he noted that vegetables had once been grown successfully at Cartwright (Cooper, 12 July) and, elsewhere, summer game were being 'bottled' and preserved for the winter (Cooper, 2 August). Cooper felt that such practices should be encouraged and even suggested that a cookery book ought to be compiled containing recipes featuring northern foodstuffs (Cooper, 1934 Observations, pp.10 and 16).

Apart from having an obvious interest in sport fishing, Cooper made little reference to other wildlife, with the exception of the mosquito scourge. These pesky creatures made a great impression on Cooper, especially at Lake Harbour (Kimmirut) where

Figure 6: Nascopie *challenging the ice.*

> the whole place was thick with mosquitos [*sic*]' Even at night, back on board ship '…it was very hot and the mosquitos [*sic*] were very bothersome, and we slept only fairly'. (Cooper, 25 July). On the following day the situation became worse: 'With bared heads we walked slowly between the lines, almost smothered by mosquitos [*sic*](Cooper, 26 July).

'A hundred or more mosquitoes buzzed round every head, and in spite of the heat, the Eskimos had the hoods of their parkas up' (Macaulay, p. 44). Evidently, in his Governor's role, Cooper felt obliged to show a 'stiff upper lip'. Unfortunately, he had no solution to the problem, and the mosquitoes still persist.

Cooper was in awe of many of the Company's northern employees' indefatigable exploits, especially those of Ralph Parsons, the HBC's Chief Factor and Fur Trade Commissioner, who accompanied the party. Parsons, who had been personally responsible for establishing most of the posts in the eastern Arctic, was ranked by Cooper as 'amongst the great builders of the Company, and I want to put him on the map and his name on record amongst the outstanding officers' (Cooper, 11 July). Although he had some misgivings about Parsons' ability to manage his personnel, Cooper's respect for him steadily increased during the course of the journey. The

Governor took Parsons under his wing and vowed to help him improve himself:

> . . . I must, by every means in my power, help him to develop himself by seeing how other people run their businesses, and getting him in close contact with big men . . . (Cooper, 16 August).

Cooper saw a number of cases where other employees were languishing in their jobs because they were ill-suited to the task, or were not being given encouragement or appropriate guidance (Cooper, 23 July). He was very concerned that the people of the North, both employees and natives, should be properly informed and educated about developments in the wider world outside of their regional environment, and was at pains to address this issue at every opportunity. In his opinion, this was essential to the Company's survival and also for the indigenous population's capacity to produce both for the Company and for their personal benefit. These sentiments are frequently expressed by Cooper in his diary and in the 'Observations' written subsequently for the benefit of the senior administration. With regard to the Company's northern employees, Cooper acknowledged that post managers need not be particularly innovative or even ambitious, so long as they did their job effectively (Cooper, 26 July). However, the Governor firmly believed that the district managers should provide leadership, supported by their superiors in the south and fed information that would enhance their performance:

> One lesson that I have learnt is that, by every means we must disseminate information as to what is happening in other places. You cannot expect these men to produce fresh ideas in large quantities; and by visits or circulars, or otherwise, we must help to give them ideas (Cooper, 23 July).

Cooper also believed that those with promise should not be kept too long in any one location, that they should receive recognition for their work, not just with medals and other symbolic gestures, but in words of encouragement and by material advancement.

On the other hand, after his meeting on board six new apprentices bound for the North, the governor was distinctly unimpressed by the Company's recruitment practices:

> They have been recruited in Montreal between the ages of 19 and 20. None of them have done any real work since they left school, although all of them have attempted to get jobs of one sort or another. I have a grave suspicion that some of them are only taking this H.B.C. job in the

> North for lack of something better, and that we shall find that, that when conditions improve and their apprenticeship is out, they will leave us; a sheer waste of time and money . . . Now that the Prime Minister has given us permission to bring in young Scotsmen, I hope the situation will be improved in some degree (Cooper, 9 July).

Based on his tour of inspection of the posts, Cooper devotes several pages of his 'Observations' (pp. 1-7) to laying out a comprehensive set of proposals relating to the organization and training of personnel operating in the North. A few of his ideas are quoted below:

> ADMINISTRATION
> In the Post organization there is only a chance for a few men to advance beyond the position of Post-Managers. The majority must be prepared to spend their working lives at the Posts. Consequently we cannot hope to have other than solid hard-working men without too much imagination as our rank and file. This means that their thinking must be done for them at head Office. On the analogy of an army there must be –
> (1) The general staff.
> (2) Regimental Officers. and men
>
> If this thinking is to be done with the maximum of efficiency there must be specialized departments with well-defined functions, run by a highly-trained central staff.
>
> In the Fur Trade to a large degree we must make our own personnel. With the determination to build patiently from within, to fit square pegs into square holes, and to train and support the men we have, rather than to dismiss them and try again, we can make better use of much of our existing material. But this must not blind us to the fact that many of the operations are of a purely commercial or industrial character and that training in other branches of commerce and industry is a better qualification for such departments than apprentice training in the Post organization which has hitherto been considered almost the only field selection for the higher positions.
>
> . . . The conditions of life at the posts are such as to retain solid, hard-working individuals rather than men of parts who would be of value in the higher positions. In order to retain the latter class of men, the Fur Trade Commissioner must watch out for them during their earlier years in the service and devise some system of training them for the higher posts. This will not only let them know that they are under observation before they start thinking of drifting away to more attractive prospects, but will give them adequate time for their training.

> …Everyone needs special help in some particular direction. It is not enough to suppose that a man can be left to sink or swim by himself and that the good man will always come out on top. It is our business to search out the most promising material and then work to supply the missing qualities and develop the latent powers (Cooper 1934 'Observations' – 'B' Fur Trade, p. 1-2).

Not only were these more strategic issues addressed, Cooper was also at pains to generate Company loyalties among the personnel at the local level. Appalled by the level of ignorance displayed by many of the employees about the Company's history and its position within the 'imperial family', he recommended that the post offices be supplied with pictures of royalty (Cooper, 1934 'Observations', p.16).

Although his behaviour towards the natives was, at times, highly patronizing, Governor Cooper nevertheless generally held them and their abilities in high regard. Moreover, he had high hopes of increasing their productivity through education and technology. As one example illustrates, Cooper observed that the narrow blade of the kayak paddle had obviously originated in the days when whalebone was all that was available and that a more efficient version could now be made from wood (Cooper, 23 July). All in all, Cooper had huge respect for the natives' abilities, not just for survival, but also for their skills in exploiting the region's resources and their capacity for change.

Notwithstanding the admiration that the Governor felt for the natives of the North, after visiting the Grenfell Mission at Cartwright, he recorded his grave 'apprehensions about the wisdom of their educational policy'. In Cooper's view:

> In a country where the people live on the bare verge of starvation, with one continuous fight for existence, you cannot afford to teach the children anything beyond the most practical and effective way of keeping themselves, that is to say: the girls cooking, house -keeping, the making of clothes, etc.; the men, boat building, fishing, fur catching, the production of pelts. Only when the wealth of the country has progressed considerably are you in any way justified in endeavouring to teach a higher standard of education. It is impossible to believe that children, brought up in these pleasant surroundings, can go back to their homes and live in their present poverty-stricken conditions in anything but a state of continuous discontent and discouragement (Cooper, 12 July).

Cooper was more reassured at Moose Factory where, at the Anglican school (a day school, with boarding for Indian children), the matron, Miss Armstrong, and her two teachers, had more sound ideas. Miss Armstrong 'was keen on giving the children such education as would improve their mode of living; cooking, fishing, etc, without giving them too many new ideas or disturbing their old ones' (Cooper, 8 August).

In his 'Observations,' Cooper offers a lengthy considered account, compiled after his journey for the benefit of the Company's senior personnel, he expanded his views on what he thought to be the most appropriate and productive training the native population could receive. He was keenly aware of the natives' innate abilities, but his primary concern was that they become economically self-sufficient and not become dependent on government welfare for their survival:

> NATIVES
> There is no doubt that our men in the North are fully conscious of the necessity for guiding and helping the natives. In their dealings with them, they show wisdom and common-sense. The better Post Managers interest themselves in every phase of the life of the natives and get to know them thoroughly. They are thus in a position to exercise the most favourable and effective influence on them.
>
> The main problems concerning both Eskimos [*sic*] and Indians [*sic*] are to keep them fully employed all the year round, and to teach them to rely on their own efforts for their support. In most places in a normal year there is sufficient trapping for all during the winter. In the summer they must be encouraged to hunt seals and walrus, and to produce boots, mitts, oil, skins, etc. They must be put to such work as canoe-building, or made to produce native handiwork such as ivory carvings or beadwork. Above all they must be brought to realize that there is no inexhaustible Government fund from which the lazy can always receive support.
>
> Today the Indian is very much more demoralised than the Eskimo. He is naturally more indolent and readier to throw his responsibilities on the Government. It will be a hard struggle to restore his pride and his energy. The Eskimo is easier to deal with. The demoralising influences have not so active. His cheerful temperament makes him more amenable to guidance and encouragement; and he has by nature more energy and keenness than the Indian. With care and patience there is every probability of developing the Eskimo into an industrious and successful people.
>
> Our policy must be in every way to encourage the natives' independence and self-respect. We must restore their sense of communal responsibility for the widows, the sick and the aged. We must struggle to overcome the

> pernicious system of indiscriminate granting of debts and Government Relief, even though this may at times lead to hardships. The Government Departments concerned have expressed their recognition of this problem, and, in its solution, their active collaboration should be sought at all times. The more we can build up a self-respecting, industrious native people, the easier will become the Government's problems and our own trade (Cooper, 1934 'Observations', 'B' Fur Trade, pp. 7-8).

In summarizing what he felt that he had accomplished during his tour, Cooper expressed considerable pleasure:

> It is very satisfactory to wind up a long and arduous trip like this with nothing worse than a pain the last night. The significance of the whole voyage is very great, and I am; gratified to think that I have succeeded in doing all that I set off to do – a thorough first hand knowledge of our trading conditions in the Far North; to stimulate amongst our men an esprit do corps; a much closer knowledge of Parsons and his problems; a very great contribution to the good relations between ourselves and the various Government Departments, which is so vital; and a great piece of publicity for the Company, which has been so badly needed and which I hope the officials can make good use of. (Cooper, 21 September).

Canadian Reaction to the Governor

It is notable that, in none of his own accounts and reflections about his northern tour, does Cooper pay much attention to the ways in which his advice and his activities might be viewed by his senior Canadian officers. He behaved rather like on old colonial officer – expecting deference and obedience, and unconcerned by any acknowledgement that those on the ground might see things differently. During conversations with Parsons during the trip (as already noted, Parsons was the Company's Chief Factor and Fur Trade Commissioner), the governor had been much chagrined to learn that no copies had been received of the sets of observations that he had produced when he had returned to Winnipeg after previous visits to the Company's posts. As a consequence, Cooper was at pains to insist that Parsons must receive a copy of the 1934 'Observations' pertaining to the current trip through the eastern Arctic. However, in the event, the Governor's wish was thwarted (as it may well have been on the earlier occasions) by Philip Chester, the Company's General Manager for Canada. Chester strongly opposed what he saw as Cooper's interference in the affairs of the Company.

Indeed, ironically, Cooper's efforts on behalf of the HBC received little support from the Company's senior officers in Canada and the evidence suggests that they were deliberately sabotaged. Philip A. Chester, who had become General Manager for the Company's Canadian operations in 1930, was distinctly antipathetic to Cooper's excursions into the north, considering them to be a useless waste of time, confessing to George Allan, Chairman of the Canadian Committee, that he had indulged in '. . . a lot of hard swearing and profanity' at the prospect of having to give up several months of his time in 'guide work' (Chester 1934a). Allan, in turn, wrote a long letter to Cooper, doing all he could to dissuade the governor from making the trip, telling him of all the hardships, including the black flies and mosquitoes he could expect to face and reminding him of the tragic loss of the Company's ships *Bayrupert* and *Bayeskimo* in eastern waters in recent years. Allan expressed particular concern regarding Mrs. Cooper's well-being if she were to go on the tour (Allan 1934a). In the event, Chester found excuses to avoid accompanying the Governor on the northern trip, passing the responsibility to Ralph Parsons, the Fur Trade Commissioner. Following the tour, Chester was also displeased by the Governor's desire to have Parsons given a copy of his 'Observations.' Not only did he disagree with many of the suggestions contained in the document, but he also rejected Cooper's wish to communicate directly with Parsons, thereby by-passing the Canadian Committee and their control over the Company's affairs in the North (Chester 1934b). Cooper's wishes in fact created a showdown between the Governor and the Canadian Committee whose members, along with Chester, were incensed at this break in the recently won chain of command wherein, since 1930, the Committee had been given devolved responsibility for administration of the Fur Trade (Allan 1934b).

Cooper was most disconcerted at the positions taken by Chester and the Canadian Board. In particular, he was completely baffled by Chester's negative attitude, becoming so frustrated that he vented all his annoyance in his diary, beginning with Chester's preoccupation with 'sundry little matters' over the allocation of expenses to different accounts, followed by a litany of deeper concerns such as: 'Chester's fight' against the granting of Fur Trade Commissions to senior traders because of his failure to 'gauge the psychology of the Fur Trade'; his inability to improve public relations with Winnipeg; his virtually open opposition to London, amounting to overt disloyalty, and the reflection of this attitude in his dealings with staff. The Governor was also acutely conscious that Chester's antagonism towards London had the sympathy of the Canadian Committee (Cooper, 22-23 August). Perhaps worst of all, it became apparent to Cooper that Chester was almost totally ignorant of the geography of the North, nor did

he have much knowledge of, or interest in, the Fur Trade (Cooper, 24 August).

Peter Newman (1991, p. 279) refers to the relationship between Cooper and Chester as a 'trans-Atlantic blood feud,' a description that was altogether appropriate and made more colourful by Newman's summation of their relationship as being like 'two scorpions in a bottle, only one would emerge the victor'. There is no question that Cooper's efforts to address the Company's problems were hampered by Chester's resentment at his meddling in its operations and management and this feeling also extended to the members of the Canadian Committee, who sided with Chester. According to Newman (1991, p. 266):

> The Hudson's Bay Company in Canada was run by a clique of buddies with limited horizons and a common mentality. Part of that mindset was their determination to break the hold on the West of St. James Street in Montreal and Bay Street in Toronto by establishing strong corporate principalities in Winnipeg. Local control of the HBC was an essential part of that strategy.

Newman - who seems strangely dazzled by Cooper's elevated social position as a member of the British upper class (the Governor was later knighted[4]), his directorship of the Bank of England, and as one who consorted with royalty – nonetheless paints a very unsympathetic picture of the Governor and his strategies for putting the Company's affairs back in order. Notwithstanding the machinations and petulance of Chester, and the Canadians' small-mindedness, parochialism, and reluctance to accept advice from London, let alone keep abreast of wider business developments, Newman emphasizes that they did eventually triumph. While further research is required to examine the extent to which Cooper's ideas and attempted reforms were incorporated into Company policy in the near term, in the longer run, Cooper was pressured into resigning from the governorship (Newman 1991, p. 307), whereas Chester went on to become the Company's Managing Director for Canada, a member of the Canadian Committee in 1941 and, eventually, a member of the London Board in 1946, before retiring in 1959 (HBCA, 2002). The HBC's headquarters moved from London to Canada, first to Winnipeg in 1970 on the occasion of its tercentenary, then to Toronto in 1987. The formerly venerable Company has now been stripped of most of its diverse activities, leaving only a retail shell of its empire and, just this year, the company was bought out by Jerry Zucker, an American financier and business mogul.

Conclusion

There is no question that Ashley Cooper took his governorship of the HBC very seriously. Moreover, as a man born in 1887, the year of Queen Victoria's golden jubilee celebration marked by the great pageant of empire in London, Cooper was strongly drawn both to the idea and to the trappings and symbols of imperial power. His tours of the Company's Canadian operations, especially his epic 1934 journey into the eastern Arctic, were undertaken in the face of strong discouragement from his senior Canadian advisors. But Cooper's copious notes and communications attest to his conscientious approach to his duties and they are full of perceptive observations ranging through strategic levels of business management and personnel matters, to micro-managerial recommendations dealing with office furnishings. The Governor believed firmly in the importance of building and strengthening loyalties both to the Empire and to the Company, a process that could be reinforced by the use of symbolic displays of tradition, permanence and social hierarchy. The records that survive of the Governor's Arctic tour are historically important as an evocation of the late-imperial encounter with the exotic and the 'other'. They also demonstrate how global perspectives can be distorted or even rejected when trying to translate them into local policy.

With hindsight, Cooper's perspectives may be seen as anachronistic. Although it may be observed that a nearly-spent candle burns brightest just before it is extinguished, in 1934, the British Empire's future was short, and the trappings and flummery associated with its past apogee were already regarded by many as inappropriate. Ultimately, Cooper's global perspectives were subverted by the Company's senior management in Canada, which was more concerned to secure increased control over the HBC's Canadian operations than it was to accept the Governor's direction and advice from London. Above all, the events of 1934, and the eventual undermining of Cooper's efforts to bring the 'global' to the 'local', illustrate the importance of individual personality, especially at the micro-managerial level. Furthermore, the episode upon which this paper has focused demonstrates starkly how difficult it can be to reconcile the global with the local: profound lessons from the past with a surprisingly strong contemporary resonance.

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Notes:

1. The term 'little brown people' was used in a still caption in the movie made of the Governor's 1934 tour: 'Governor's Trip to Eastern Canadian Arctic' 1934
2. This two hour long film: 'Governor's Trip to Eastern Canadian Arctic, 1934,' is held in the HBC Archives in Winnipeg (HBCA, F16 HBC/1987/82).
3. The HBC's employees were issued with a gold long-service medal after twenty years service, with additional gold bars for each additional five years of service (Gingras, 1968 p. 39).
4. Cooper received his knighthood in 1944. As a Bank of England director, he was a freeman of the City of London. He served as a governor of Guy's Hospital in London and he was in 1931 a member of the UK government's National Economic Committee, and a member of the Board of Trade Advisory Committee for four years between 1929 and 1933. He owned large country homes; the first was in Buckinghamshire, but he later purchased the 2,473-acre (1,000 ha) Hexton estate in Hertfordshire with which went the courtesy 'lordship' of the manor.

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Memory and place-based identity of the elderly in Margaret Atwood's *The Blind Assassin* and Margaret Laurence's *The Stone Angel*

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Abstract: The social alienation of the elderly leads to restricted personal geographies, diminished self-worth, and loss of functional roles. The elderly reaffirm their identity through the use of spatially based memories, linking their lives to the cultural value of 'place.' Through a unique approach to the existing field of the geography of literature, we examine the constructs of the 'essence of place,' 'insideness and outsideness,' 'the geographic self' and the spatial characteristics of the elderly to identify a 'geography of personal identity' as expressed, specifically in a literary context, through the spatial memories of the female protagonists in Margaret Atwood's *The Blind Assassin* and Margaret Laurence's *The Stone Angel*.

A prevailing and negative societal perception among Western cultures towards the elderly has served to alienate this social group leading to a loss of functional roles, a restricted personal geography, and a diminishing sense of self-worth (Stone, 2003; Biggs, 1993; Moody, 1986). The elderly reaffirm their identity and importance of role through the use of spatially based memories, intrinsically linking their lives to the identity and cultural value of 'place.' For Canadian writers Margaret Atwood and Margaret Laurence, 'place' has been a consistent undercurrent in the development of their female characters[1]. Rao (1994), Thomas (1975; 1990), McCombs (1994), Greene (1994/5), and especially Weir (1983) have noted how 'place' has played an important role in each author's works, but their treatment of 'place' is not defined within the geographic context of place-theory[2]. In an effort to clarify the 'place' concept from these earlier works, this paper employs a cross-disciplinary approach, uniting both geographic and

literary traditions (Mallory & Simpson-Housley 1987; Finch & Williams, 1989; Quantic, 1995). In this paper, we build upon the constructs of the 'essence of place,' 'insideness and outsideness,' 'the geographical self' and the spatial characteristics of the elderly as they are expressed, specifically in a literary context, through the spatial memories of the female protagonists in Margaret Atwood's *The Blind Assassin* and Margaret Laurence's *The Stone Angel*.

The Essence of Place

Places are those constructs of both human and natural orders that are the centres of our existence. Place is not concerned with the geographic location of activity (a grassy field, a city, a fictional landscape – these are the purview of 'space'), but rather place is intent on the experience and the emotional significance of a particular setting. Place has as its basic constructs the objects of space as they are experienced, imbued with meaning, and rooted in activities centred about those experiences and meanings. Places are "sources of individual and communal identity, and are often profound centres of human existence to which people have deep emotional and psychological ties" (Relph 1976, 141; Tuan 1974; Seamon, 1980; Sack, 1992; Casey, 2001; Creswell, 2004).

Those deep emotional and psychological ties instil place with the memories of the meaningful events, experiences, and ongoing actions of our existence. Without 'place', our lives are devoid of meaning (social, cultural, or economic) in the world: "A deep relationship with place is as necessary, and perhaps as unavoidable, as close relationships with people; without such relationships human existence, while possible, is bereft of much of its significance" (Relph 1976, 41). This significance is the broader understanding of our identity—our awareness and consciousness of place is a vital source of both individual and cultural identity and security, a point of understanding from which we orient ourselves in the world. Casey (2001) holds that we orient ourselves in the world through "the geographical self" – the personal nexus between our experiences in the landscape and our contextualization of those experiences through time – but more on this later.

One of the strongest 'places' for identity is the concept of 'home' (Tuan, 1974; Tuan 1996). Home is that place that is most familiar, most intimate. The old adage never rang more true: "There is no place like home." This simple statement sums up the essence of place. Place is that memory laden centre of life where one develops a sense of being and

understanding of the unfolding of life events, grounded against the meanings such events hold for one's life, contextualized by the memories (events, experiences, and their emotional attachments) developed from one's place in the world (for a spectrum of coverage of the concept of 'home' and its importance to the 'self' (see Heidegger1962; for foundations, and Tuan1996; and Sack 1997; for current applications).

Insideness and Outsideness

One of the phenomenological constructs used to understand and develop the notion of place is insideness. Insideness, or being inside, is fundamental to place: "To be inside a place is to belong to it and to identify with it" (Relph 1976, 49). Such identification is paramount to place, for identification with a place is more than just the site and situation of a setting, but more importantly it is the entirety of the experience at that setting that gives it meaning, and such meaning becomes part of our memory to identify like places. Akin to Ingarden's (1973) '*parathaltung'* and Bourdieu's '*habitus'*(1977) insideness allows the individual to experience the location at the moment, become part of the scene as an active participant, and then make that event part of their being such that the *memory* of the experience/location along with its impact on the individual (Bourdieu's nexus between self and place, or Soja's (1996) 'thirdspace') helps the individual develop self-identity and 'persistence of place in the body' (Casey, 2001). Insideness, therefore, is that deep level of understanding about a place that can only be developed through experiences at that place. The more profoundly inside one is the stronger one's identity with the place.

Insideness is developed through the collection of life experiences, where those experiences are contextualized at the individual level. One's insideness increases throughout the drive to maturity as experiential space, one's life-space, unfolds and becomes geographically larger (see Figure 1). Insideness provides one the ability to place the significance of events in life into the context of time and place (*parathaltung*). Very much a form of tacit knowledge, insideness is that degree of understanding about a place that can only be realized through direct experiential contact and embeddedness of a person in that place (see Lefebvre, 1991 and Entrikin, 1991).

Outsideness is the opposite side in this dual expression of place and personal identity with place. If one is not inside, by definition, one must be outside. Insideness is an intimate knowledge of place based on the

existential phenomena associated with the place; while outsideness is a passivity of experiential connectedness to place. Outsideness to places (therefore, locations or spaces) is as if one is looking at a setting without feeling, meaning, or the ability to understand the context of the activities occurring at that location. Disconnectedness with the events of the location, and a lack of experiences (memories) in order to contextualize and 'place' those events, contribute to being 'outside.' Insideness versus outsideness is akin to being an active participant versus being a passive spectator.

The Geographical Self

Grounded in phenomenology, the 'self', especially as it relates to the topic of the next section – personal identity – has a long standing tradition extending as far back as Locke's 17th century essay on human understanding (Nidditch 1975). According to both Sack (1997) and Casey (2001), based on the work of Locke we identify our"self" as "a function of the consciousness of its own past through memory" (Casey 2001, 693). The self is corporeal; memory the purview of the ephemeral, but created from situating the body of the self in place and time. Bridging the gulf that separates the self from the body and place need not be a span separating two solitudes, but rather as Sack states the two are mutually reinforcing, helping to define one another. In other words, as Casey notes "there is no place without self and no self without place" (Casey 2001, 684).

This circular definition can blur the articulation of place and self, and thus requires a mediating term to serve as the bridge, or glue, that binds these concepts together. Such a term is the '*habitus*' borrowed from Bourdieu (1977) and applied by Casey (2001). The *habitus* is the contextual agent between our lived places and our geographical self. The *habitus* serves as the intermediary between our current physical location and what "one has experienced in particular places" (Casey 2001, 686) – our memories – that give meaning (both personal and situational) to our current circumstances. The *habitus*, as the agent between place and self, is interpreted well by Casey:

> "When I inhabit a place – whether by moving through it or staying in it – I have it in my actional purview. I also hold it by virtue of being in its ambiance: first in my body as it holds onto the place by various sensory and kinaesthetic means, then by my memory as I 'hold it in my mind.' This is how the durability of *habitus* is expressed: by my tenacious

> holding onto of place so as to prolong the experience beyond the present moment." (687)

It is in this manner that place and self coalesce.

Implicit in this construct from Casey is the presence of time. Time cannot be ignored as it permits for the contextualization of place on the self beyond the present – thus the durability described by Casey. However, time also has the effect of changing and restructuring the meaning of the memory of those places as they influence the self. The effect of time on *spatial memory* has two potential outcomes. The memory may resurface with *parathaltung* – rich with meaning derived from past place-based experiences, but potentially (and likely) 'enhanced' with current contexts and rooted in nostalgia. Or, as Sack notes, the spatial memory may become 'thinned out' weakening the link between place and self. The consequence is a desiccation of both place and self, such that if new places are not sought to build the self, then a loss of place results in a loss of self – and through self, personal identity.

Here we argue that the implications for place and self are not a double loss, but that there is a third element: the increase in the use of spatial memory to counter the loss of place and self over time and as one ages. Spatial memory is a parallel to Casey's 'incoming subjection' where "we are still, even many years later, *in the places we are subject* because *they are in us*" (Casey 2001, 688, emphasis original). Place-based, or spatial, memory serves to recall places and times through insideness, the persistence of place and *parathaltung* to help ground and re-situate the 'self' by re-affirming the 'self' (and therefore one's personal identity) in a context of familiarity - even when the spatial context may be completely foreign.

The geographical self is created and re-created by identification with place(s), contextualized into the consciousness through insideness and bound to one another through the agent of memory. It is a self-reinforcing reciprocal arrangement that (re)creates both place and self in each new situational/locational event. When time affects the binding agent (memory), instead of a loss of place/self cohesion, spatially-based memories fill the void to re-create and reaffirm the 'self' – and therefore one's personal identity.

The Geography of Personal Identity[3]

Throughout one's existence, one's personal geographies (life-spaces) change. As infants, the world is focused in a locally (home)-centered,

parentally oriented, highly 'place' bound life. As one ages, life-space extends to its spatial maximum during adulthood where one becomes spatially unbounded, has a high degree of mobility, and is capable of identifying and associating with 'places' as one has identified them in youth and continues to create like places in adult years (see also Tuan 1996). Beyond adulthood, when old age diminishes one's spatial extent, life-space contracts to the point where it, too, is home centered and place takes on additional meaning (Pastalan 1971).

The cumulative effects of insideness (one's experiential connectedness with a setting in combination with insideness – incoming tenacity according to Casey) develops a heightened sense of place, and self, and the role memory serves to contextualize and reaffirm the nature of place, results in what we term a 'geography of personal identity'.

The geography of personal identity is intrinsically tied to place, self and one's insideness with that location. In the inexorable march from infancy to old age, personal identity evolves. As a child, the world is the world of one's parents – a home, a street, a park, and the like. The world, one's place, is small in scope and scale, yet one identifies with it intimately (Tuan 1996; Sack 1997). As one's cognitive abilities improve in maturation past infancy, one's world expands. As one begins to explore the world beyond the immediate home, and develop the first connections with one's proximate setting, one begins to develop a sense of 'place' and 'self'. As young children and early adults, one's mind-space – that spatial construct of the imagination based on childhood stories, fictional works, and the fantasy of youth (early spatially based memories/imagination) – is extensive and large, extending the spatial reach of the world beyond the confines of immediate existence. One draws on memories and imagination to extend the spatial boundaries of what is still a spatially restricted space.

As adults, one's life-space is filled with the banalities of daily life, reducing the need for imagined landscapes (mindscapes); however, those daily experiences have a far-reaching spatial extent. As one ages, and life events begin to fill one's time, there is less reliance on mind-space as spatial imagination is replaced with spatial experience. One's spatial reach expands, the existential connectedness with place continues to grow (our sense of self increases), and one develops a profound insideness (understanding and emotional connection) to place (see Sack 1997 and Soja 1996).

After this relatively stable period of spatially unbounded behaviour, there is a dramatic reduction in life-role, with concomitant reductions in physiological capacity. As one enters old age and the functional social role (job or career) that one previously held that allowed for a continual expansion of life-space, is ripped from one's future experiences, one's

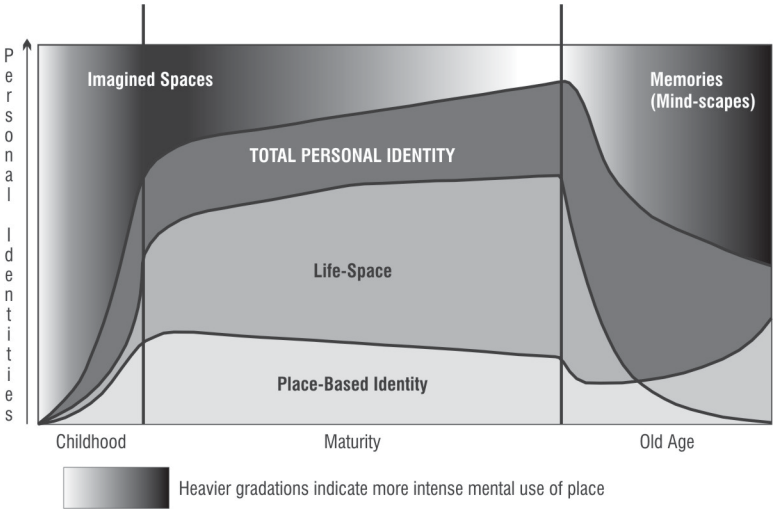

***Figure 1**: Space, place and personal identity.*

personal geography is diminished and his/her identity (self) is forever altered (see Angus *et al.* 2005 for a summary and application of Bourdieu's work within this context). An ever-increasing reliance on place-based memories grounds and reasserts the self and, therefore, personal identity in the face of substantive personal and societal change. The personal identity life space is shown in Figure 1.

The effect of the "physiological and psychological changes [that result] in the restriction of the individual's physical mobility (life-space) are accentuated by crippling loss of role" (Rowles 1978, 23). This loss of role, often the result of traumatic changes such as retirement and physiological decline, manifests itself through societal "disengagement" (Cumming 1961), more commonly referred to as withdrawal, "accompanied by progressive constriction of the individual's geographical life-space, and associated intensification of attachment to the proximate environmental context [place]" (Rowles 1978, 22). "Advancing age is also attended by selective changes in psychological capabilities: there is a rise in sensory thresholds; it becomes more difficult to absorb, organize, and evaluate environmental stimuli…especially new stimuli. These changes often engender feelings of incompetence and insecurity resulting from both actual and perceived loss of capability" (Rowles 1978, 23). In order to mitigate such limitations of their psychological facility, the elderly venture less into situations with heightened levels of new stimuli; and with ever

progressing age, increasingly flood their thoughts with the memories of their past – a time when they were more mobile, more physically capable, more psychologically discriminating, and more geographically unbounded.

Rowles states "the elderly gradually become prisoners of space" (Rowles 1978, 22). With a more spatially bound existence, with a more temporally flexible lifestyle, and with less connection to a world in which one was "inside," the elderly are cast into "outsideness" with their environment in much the same way as children (the other end of the 'dependent' spectrum) are more outside than inside. The focus becomes more home-based, and the elderly, now with more experiential context and a greater repertoire of memories upon which to draw than do children, begin to fulfill their need for a continued personal identity and sense of self through the use of memories. Very much a personal dialectic for the elderly, the geography of their personal identity is a battle between a need for continued insideness, and, therefore, sense of self-worth, amidst their new found position of societal outsideness and disconnectedness with the setting that has been 'their place' for many years (for a complete treatment of this complex relationship between aging, space and identity, see Biggs 1993).

The insecurity and diminished sense of self-worth perceived by the elderly leads to a dichotomous relationship between physical and mental spaces. As the physical space contracts, home becomes more important and more comforting as a grounding force in the increasingly unfamiliar environment of the "outside" world. To counter the limitation of spatially constrained life-space, the mind-space increases drawing on important dates and locations, especially amidst the local surroundings, as a reaffirmation that this life, while now less vibrant, was at one time important to the meaning of 'this place.'

For the elderly, the memories of place, especially those places that helped form their former identities (economic, social, or cultural) and therefore their 'self' are brought to the fore with increasing regularity in later years in a reaffirmation and reassertion that their lives, while now on the 'outside,' helped to define the very essence of the setting now perceived by those 'inside,' as '*their* place'. Memory, in this context, provides a broader base for the continuity of 'place' as it evolves, and the shared memories that define the essence of place are transferred from one group's memories and social identity to another group's position of insideness within 'place'. By acknowledging the role of memory within this holistic interpretation and application to place, "we can detect a rationale behind the observed propensity of older people to muse on environments of their past, and to surround themselves with cues" (Rowles 1978, 208) linking them with the importance of events in their formerly more active lives.

Literary Application

Examining these concepts in a literary context, specifically in Margaret Atwood's *The Blind Assassin* and Margaret Laurence's *The Stone Angel*, we are able to trace the development of the elderly protagonists' personal identities through their relationship to the essence of place, and their sense of insideness and outsideness that shape their personal geographies. Atwood and Laurence create compelling and credible fictional characters that find their physical life-spaces have diminished with age and disease. Both Iris in *The Blind Assassin* and Hagar in *The Stone Angel* invoke place-based memories to re-examine their lives from childhood to death, memories that serve to expand their life-spaces, provide a renewed sense of self-worth, and allow the characters a sense of acceptance of their own identity. Atwood and Laurence develop their protagonists' attachment to place through the examination of ancestral roots, childhood, marriage, escapism, aging and disease, and finally, death. Through this chronological series of life-events, grounded and contextualized through associations to place, these characters reaffirm their identities.

While numerous authors have written on the subject of Hagar's life and her sense of identity in the novel (see Beckman-Long 1997; Salick 1992; and Taylor 1996), and similarly for Atwood's character Iris (see Bouson 2003; Dvorak 2002; and Staels 2004), none have yet characterized their lives through a deep connection to *place* utilizing its correct geographical interpretation. This paper serves to fill that void.

In *The Blind Assassin* (BA), Atwood develops the character of Iris Chase, an octogenarian who is increasingly housebound due to limited physical mobility. Iris is intensely aware of her diminished personal geography, how she has become a prisoner of her own aging and diseased body, and the limitations it has imposed upon her relationship with her setting. One such example of her reduced capacity to interact with place in an independent manner is that she must rely on others for transportation, admitting that "Once I drove, but no longer: my eyes are too bad for that" (BA 57). Another example occurs while Iris is walking en route to a planned destination, but when she is intercepted by a younger friend offering her a lift, she confesses, "I'm ashamed to say I accepted it: I was out of breath, I'd already realized it was too far" (BA 212). The admission of failing health and her consequentially shrinking life space leaves Iris feeling objectified and stripped of identity, a passive spectator or outsider in her own hometown of Port Ticonderoga, evident in her reaction to the event: "More and more I feel like a letter—deposited here, collected there. But a letter addressed to no one" (BA 213). Her sense of outsideness and lessened self-worth stems from her decreasing ability to form new attachments to

place (a weakened *habitus*), rendering her spatially-based memories of past experiences the essential link to reaffirming her own personal identity while regaining a level of previous insideness through minute references to *parathaltung*..

Laurence's *The Stone Angel* (SA), published almost four decades before Atwood's *The Blind Assassin,* offers the convincing construction of another elderly female protagonist, Hagar Shipley. Due to her failing health and ailing body, Hagar is portrayed as struggling to contend with her increasingly limited experiential connectedness with places that were once a part of her life, her 'self', inciting a sense of outsideness and reduced validity in society. Hagar has reached a stage in her life where she is regarded much like a dependent child, whose lifespace is controlled by outside forces, resulting in a smaller physical realm of personal geography. As a consequence of Hagar's diminished physical abilities to care for herself, her son Marvin and his wife Doris hire a young girl to remain with her in their absence, resulting in Hagar's horrified response: "You think I need a sitter, like a child?" (SA 67). Linking the elderly and the very young together in their lack of independence Hagar muses that: "Privacy is a privilege not granted to the aged or the young. Sometimes very young children can look at the old, and a look passes between them, conspiratorial, sly and knowing. It's because neither are human to the middling ones, those in their prime" (SA 6). Hagar anticipates that dependency will weaken her sense of identity as a strong, fiercely independent and headstrong woman, and will decrease the "permitted" size of her lifespace. Donna Palmateer Pennee comments that Hagar in "her old age…can no longer escape the body that she has systematically repressed" (Pennee 2000, 5), other than through place-based memories.

Allowing the elderly and dying Hagar the opportunity and dignity of reaffirming her self-worth as a human being, Laurence employs a narrative technique that enables Hagar to escape her restricted physical geography, and expand her lifespace through very powerful spatially-based memories, triggered at intervals throughout the novel often by the sight of objects around her or by the mention of a word (a quintessential condition of *parathaltung*). Atwood, in *The Blind Assassin,* employs a narrative technique similar to Laurence's in *The Stone Angel,* as both authors create protagonists that relive their lives in chronological order through place-based memories. In contrast to Hagar's silent and unrecorded memories of her life, Iris writes her memoir in book format, in an effort to grant her granddaughter Sabrina a more truthful sense of her own ancestry.

Intensely aware of the dichotomy of her declining physical space and increasing mental space, Iris catches actual glimpses of her former youthful self in the mirror, emphasizing the close proximity of her remembered past:

"When I look in the mirror I see an old woman….But sometimes I see instead the young girl's face I once spent so much time rearranging and deploring, drowned and floating just beneath my present face, which seems…so loose and transparent I could almost peel it off like a stocking" (BA 54-55). Through written memoirs, Iris resuscitates her former self, breathing life into a character, that through a sense of forbidden exposure of her true attachment to place and events, performed her public life as one on the outside, relegated to the margins of social insideness, never fully participating.

Similarly, the memory of Hagar's youth in *The Stone Angel* lurks below the surface of her time-worn face when she looks at herself in the mirror: "I am past ninety, and this figure seems somehow arbitrary and impossible, for when I look into my mirror and beyond the changing shell that houses me, I see the eyes of Hagar Currie, the same dark eyes as when I first began to remember and to notice myself" (SA 38); and through memory Hagar still perceives herself as a young girl, full of vitality and life, fully integrated into society: "now I feel that if I were to walk carefully up to my room, approach the mirror softly, take it by surprise, I would see there again that Hagar with the shining hair, the dark-maned colt off to the training ring, the young ladies' academy in Toronto" (SA 42). Referring to Laurence's use of mirrors in *The Stone Angel*, Sally Chivers in her book *From Old Woman to Older Woman*, remarks that the "trope of mirror gazing pervades negative fiction of aging because characters struggle with a new self-identification in connection with a changed physical form" (Chivers 2003, xlv). Hagar will "not internalize her unreliable appearance. Doing so would be to accept the social pity she has so long disdained and to incorporate a representational framework that limits her body to decrepitude" (Chivers 2003, 25). Laurence's use of the mirror functions also as a doorway to another time and place, further demonstrating Hagar's attachment to her younger, more spatially-mobile self. M.F. Salat comments that Hagar's "inability to come to terms with her past that is chiefly responsible for her inability to come to terms with the present and hence a re-view of and reconciliation with the past enables Hagar eventually to discover who she really is" (Salat 1993, 46). Alice Bell, in examining narrative structure in *The Stone Angel*, states that "Laurence portrays Hagar at the most vulnerable time in her life—when she is dying—when she can no longer control her body, or repress her fears and emotions or maintain a façade of dignity and autonomy. Under these circumstances, we see her weaknesses and her strengths, her self-knowledge and her self-deception, and her regret for might-have-beens" (Bell 1996, 59-60). These dichotomous literary constructs of Laurence are precisely the tenets and contexts employed by Bourdieu in his description of '*habitus*' as a mediating agent for personal

identity and self. Laurence's technique of linking Hagar's past to specific places permits her elderly protagonist the ability to (re) discover her self-identity as a young woman in an old woman's diseased and dying body. Hagar re-experiences significant moments in her life during which she felt a deep sense of attachment to place (whether positive or negative), allowing her to escape her present situation that has rendered her an outsider in society.

Atwood constructs Iris's initial sense of self through her attachment to Avilion, a place that is replete with reminders of its previous inhabitants, especially Adelia, Iris's grandmother. As a young girl living in Avilion, Iris experienced a very strong sense of insideness, akin to what Relph describes as "vicarious insideness" or the ability "to experience places in a secondhand or vicarious way, that is, without actually visiting them, yet for this experience to be one of deeply felt involvement" (Relph 1976, 52). While Iris lived in the same house as did her grandmother Adelia, the sense of place had been altered by time (see Sack's (1997)'thinned out spaces'), and Adelia's death, allowing a teenage Iris to reinvent her grandmother's life and interaction with space: "I used to romanticize Adelia. I would gaze out of my window at night, over the lawns…and see her trailing wistfully through the grounds….Soon I added a lover. She would meet this lover outside the conservatory, which by this time was neglected…but I restored it in my mind" (BA 76). Here Atwood aptly creates a character whose sense of self is developed positively through a very intense and memory-based relationship to a place that she recreates in her imagination, and in remembering this connection to place, the elderly Iris reaffirms her sense of belonging and connection to her own hometown that has changed so drastically without her, and re-establishes her connection with her ancestral roots.

Not unlike Iris in *The Blind Assassin*, whose self-identity was partially formed from an attachment to spatially based memories of her ancestors, Hagar in *The Stone Angel* also experienced vicarious insideness, and a strong sense of personal identity as she learned of her grandfather's ties to Scotland (SA 14-15). Hagar longed for her ancestral landscape: the castles, the refinement, Scotland itself, stating "'How bitterly I regretted that he'd left and had sired us here, the bald-headed prairie stretching out west of us…and the town where no more than half a dozen decent brick houses stood'" (SA 15). Commenting on this same quotation, Karin E. Beeler states that the "imperial centre that she [Hagar] creates out of the land of her Scottish ancestors causes her to value this world of experience over Canada in a typically colonial fashion" (Beeler 1998, 26). Through memory, Hagar experiences first as a child, and re-experiences later as an elderly woman, a much deeper sense of insideness to a place explored

through second-hand knowledge, than to her own post-colonial hometown. Laurence's portrayal of Hagar's emotional attachment to borrowed memories of a location-based era provides foundational support for the development of Hagar's superior sense of self and blind pride.

As a very young child Iris experienced, for a short time only, the innate sense of "existential insideness," defined by Relph as the "most fundamental form of insideness in which a place is experienced without deliberate and self-conscious reflection yet is full with significances. It is the insideness that most people experience when they are at home and in their own town or region" and it "characterizes belonging to a place and the deep and complete identity with a place that is the very foundation of the place concept" (Relph 1976, 55). Atwood idealizes, then immediately subverts this sense of insideness and the adage of "home sweet home" with her description of domestic bliss in *The Blind Assassin*: a quiet intimate atmosphere centered around a glowing fire, where a four-year-old Iris pretends to read to her father, while her mother sits sewing (BA 101-2). The elderly Iris, remembering what at the time was probably a deep attachment to place and a feeling of security (*parathaltung*), views it now in hindsight and realizes that it was not so idyllic, that her father was haunted by demons from the war that claimed his leg and eye, that he and her mother were not happy together (BA 100-3). Atwood's sub-narrative allows the elderly Iris the opportunity to realize that she was not to blame for her parents' failed marriage, and that in retrospect, she exhibited comparable attitudes towards her own marriage as did her parents towards theirs.

Laurence's similar examination of Hagar's early childhood through placed-based memories presents the scene of a six-year-old Hagar and her two older brothers sitting "around the dining-room table," as they did every evening, finishing homework under the watchful eye of their father (SA 13). Initially this memory appears to demonstrate Hagar's close attachment to her home and her family, yet the scene is not idyllic either; instead, it is one in which Hagar remembers the children being frequently admonished by their gruff and overbearing father. Motherless, Hagar's connection to her home was shaped by her relationship with her abusive brothers who whipped her with maple switches (SA 8), her emotionally detached father who chose propriety and financial gain over his children (SA 9), and her father's housekeeper, Aunt Dollie who served as a form of surrogate mother, although was regarded mainly as just the "hired help" (SA 6). What the elderly Hagar gains from reliving this stage of her life is an affirmation of self: that she was, and still is, stoic and unyielding in the face of adversity (SA 10). The fact that her early home life was something she eventually chose to escape, renders her attachment to her own home as an adult all the more significant and poignant. Laurence depicts her

protagonist equating her home with her identity, in a relationship that is inversely proportional: as Hagar's own personal geography decreases, her emotional connection to her home and the invoked place-based memories, increases.

The thought of Marvin and Doris selling her home (the home that now legally belongs to Marvin) and moving into an apartment, threatens Hagar's sense of identity and existential insideness: "the house is mine. I bought it with the money I worked for, in this city which has served as a kind of home ever since I left the prairies. Perhaps it is not home, as only the first of all can be truly that, but it is mine and familiar" (SA 36). Her lifespace has so greatly diminished with old age that she is unable and unwillingly to relinquish her only remaining (physical) source of place-based identity: her home. W.H. New posits that "Hagar takes Manawaka into her son Marvin's suburban home and then into the multicultural hospital in Vancouver" (New 2001, 66), and Constance Rooke in *Fear of the Open Heart* writes that the "house is then developed as an image of the self, the societal construct and the body" (Rooke 1989, 78), while in contrast Ann Barnard states that "Hagar spends her life seeking a place, only to find it in herself, never in 'the Shipley place' or even the Vancouver house that passes to her son Marvin and his wife" (Barnard 1994, 25), but Hagar's self-identity is so intrinsically linked to place, to her hometown of Manawaka, to the houses in which she lives, and to her own body that she identifies more with her place-based memories and her possessions than with any of the other characters in the novel.

Laurence captures the essence of Hagar's self-identity as Hagar worries about having to store her belongings, her "shreds and remnants of years," as she states: "`If I am not somehow contained in them and in this house, something of all change caught and fixed here, eternal enough for my purposes, then I do not know where I am to be found at all" (SA 36). While Helen M. Buss comments that Hagar is "a woman who in her childhood has learned to value things above people" (Buss 1985, 27), by extension, Hagar continues throughout her life, to value things and places above any relationships with people, to the extent that she derives her self-identity from her surroundings rather than from the other characters in the novel. Understandably then, Hagar associates leaving her home with the notion that she would no longer exist, that her relationship to any other place would be one of complete outsideness, or similarly, death.

In contrast to Hagar's fierce attachment to her home as an affirmation of her existence, Iris in *The Blind Assassin* experiences such little attachment to her house that she feels as if she does not belong in it at all: "I've had it before, the sense that even in the course of my most legitimate and daily actions - peeling a banana, brushing my teeth – I am trespassing" and "At

night the house was more than ever like a stranger's….My various possessions were floating in their own pools of shadow, detached from me, denying my ownership of them" (BA 72). Unlike Laurence's Hagar who is terrified of dying and rebels against leaving behind her possessions and her home, Atwood's Iris has already resigned herself to the fact that she is going to die shortly and has severed her emotional attachment to her present place: "All of it will have to be gone through, disposed of by someone other, when I die" (BA 72). Her need to remain alive is based on wanting to remember her life and record it in written form in order to alter a false history, while Hagar's need to stay alive is out of a sense of fear of the unknown, and a need to remain constantly in control.

In *The Blind Assassin,* Atwood explores the emotional mindscape of Iris's proposed marriage to Richard by equating it to an actual physical landscape: in the "vast bed of the hotel. My feet were icy, my knees drawn up…in front of me the arctic waste of starched white bed sheet stretched out to infinity. I knew I could never traverse it, regain the track, get back to where it was warm; I knew I was directionless; I knew I was lost" (BA 87). Significantly, this imagined "place-based" memory, still imbued with an acute sense of lost identity, is one that the elderly Iris invokes. Such feelings of extreme outsideness are defined by Relph as "existential outsideness," a sense of disconnectedness that "involves a self-conscious and reflective uninvolvement, an alienation from people, and places, homelessness, a sense of the unreality of the world, and of not belonging" (Relph 1976, 51). Atwood foreshadows that Iris's marriage will cast her in the role of an outsider and passive observer, exiled from the insideness of her own home, acted upon, rather than being active. Hilde Staels comments that "Iris would not see the danger of consenting to marry Richard, a man she did not love. Not questioning the 'normal' course of her life resulted in the assassination or sacrifice of her inner self" (Staels 2004, 156).

Iris's life-space continues in her marriage to be similar to what she experienced as a child: limited, confined: "Not for the first time, I felt like a child excluded by its parents. Genial, brutal parents, up to their necks in collusion, determined on their rightness of their choices, in everything" (BA 387). This lack of independence is significant in Iris's development of her sense of self, and her sense of place, as she is rendered an outsider. As all decisions were made for her, without her agreement or knowledge, Iris was marginalized in her new home, and relegated to playing the role of dutiful wife, educated during her honeymoon in England according to Richard's instructions: "He hired a car and driver for me, and I was taken out to see what in his view ought to be seen. Most of the things I inspected were buildings, others were parks….He did not encourage the visiting of museums….it had become evident that this is what all of these visits were

aimed at—my education" (BA 380-1). At this point in her life, Iris's relationship with place was as emotionally detached as she was from her husband; both relationships were void of deep meaning and connectedness. The elderly Iris, reconnecting with her former repressed self, openly acknowledges this portion of her life, accepting it as a factor in the shaping of her personal identity, while revealing her own hidden personal landscapes in her memoir written expressly for her granddaughter.

Laurence's exploration of Hagar's memories in *The Stone Angel* includes a section of the novel in which Hagar marries Bram Shipley, resulting in Hagar's emotional and physical detachment from her own family, her former home, and the town of Manawaka itself. Hagar mistakenly believed that Bram's own outsideness from society was something she could change, one day allowing them access into the most coveted places of the social elite. Instead, Hagar became more and more reclusive, as Bram's unrefined language, lack of manners, and general disregard for other people's attitudes towards him made her too embarrassed to accompany him to town on shopping errands: "After the first year of our marriage, I let Bram go to town alone, and I stayed home" (SA 71). Eventually, even attending church became too embarrassing, and Hagar states: "I never went to church after that. I preferred possible damnation in some comfortably distant future, to any ordeal then of peeking or pitying eyes" (SA 89-90). Marriage for Hagar represents a very diminished sense of attachment to place, creating a reduced sphere of living space, that of her new home.

Hagar's memories of her new home, though, depict it significantly as a poorly kept house, one that was "square and frame, two-storied, the furniture shoddy and second-hand, the kitchen reeking and stale" (SA 50), that remained "an unpainted house" (SA 84), full of promise, that was never fulfilled, reflecting and symbolizing Hagar and Bram's relationship that too was colourless, unfinished, and raw. In terms of Hagar's relationship to the surrounding farmland, George Woodcock comments that "Earth in the sense of land is also important to her, and it is as much to live on his farm as to be ploughed sexually by him that she marries the socially impossible Bram Shipley; she resents the fact that Bram wastes his land on grazing horses, instead of tilling it and making it productive" (Woodcock 1980, 57). Hagar had opportunities to change her relationship with Bram, making it more emotionally and sexually intimate, but chose instead to keep "her trembling…all inner" (SA 81), eroding their relationship and marriage. She tolerated him because he fulfilled her hidden sexual desires, but in exchange, she suppressed her self-identity, allowing herself to become marginalized in society, while essentially imprisoning herself in a very confined and limited place. The elderly Hagar, reflecting on the

suppressed intimacy of her marriage, remarks that "Now there is no one to speak to….My bed is cold as winter, and now it seems to me that I am lying as the children used to do, on fields of snow…The icy whiteness covers me, drifts over me, and I could drift to sleep in it, like someone caught in a blizzard, and freeze" (SA 81). Like Iris in *The Blind Assassin,* Hagar equates emotional outsideness and detachment with the imagined landscape of a frozen wasteland.

Atwood and Laurence present the effects of their protagonists' marriages as negative, and symbolize the lack of emotional connection in the relationships with the diminished physical life-spaces of their characters. Both authors do, however, provide a form of escape for their main characters allowing Iris and Hagar to expand their personal geographies and form emotional attachments to new places. Atwood's Iris escapes into two separate but interconnected spheres: an extra-marital affair with a writer, and the landscape of her own created work of fiction based on the affair, while Laurence's protagonist moves from Manitoba to British Columbia in order to create physical distance between her and her husband.

The newlywed Iris in *The Blind Assassin* was free to explore Toronto during the day: "In theory I could go wherever I liked" (BA 405), signifying the freedom of a young adult, physically healthy, mobile, and capable of interaction with places that might be inaccessible to the elderly, and it was during that time that Iris connected with Alex and they initiated their affair. In contrast to Iris feeling a sense of outsideness with Richard and disconnection with place, her bond with Alex was so emotionally connected with place that she was unable to separate her thoughts of him from the various rendezvous points, and their own intimate, fictionalized creations of place. Her relationship with him, the elderly Iris eventually reveals, is one that she recorded, years ago, as the sub-narrative of her life, published under the title "The Blind Assassin," falsely attributed to her deceased sister, Laura. Patricia Paillot comments that the "embedded narratives of the Russian-doll construction follow an overall architecture of inversions, paradoxes which evolve into interplays: the apparently two solid separate narrative blocks turn into an increasingly fluid system and *The Blind Assassin* becomes a metaphor of the decline and the deep change of the Canadian society portrayed in *The Blind Assassin,*" (Paillot 2002, 123), but the embedded novel within the main novel is also a metaphor for Iris's inner life, the personal landscape that she and Alex explore secretly together.

By reclaiming authorship of her novel, and thus her life, Atwood's elderly Iris re-experiences through memory, a time when she was most connected to place, and ultimately to herself. Places that are now essentially inaccessible to her as an elderly woman are revisited in her mindscape, detail by detail, to recreate a time and sense of self when she was young,

desirable, and in love. This return to specific places, made emotionally important because of Iris's relationship with Alex, is a tactic that she employed throughout her life, especially while living with Richard, and longing for Alex, as Iris wrote in "The Blind Assassin" that "In the afternoons she takes refuge in memory" (BA 441). Atwood's use of *mise en abyme*[4], nestling narratives within narratives, further establishes her protagonist's deep connection to place. Recalling place-based memories of her encounters with Alex, Iris recorded every detail she could remember to re-create the many locations of her characters' rendezvous within her own novel: the rented or borrowed rooms in which they met (some examples found on pages 137, 154, 313, 334, 346, 429, 442, 457); the picnic under the apple tree (BA 12); the meeting on the park bench (BA 22); the stone bench in another park (BA 26), and under the bridge (BA 32) to suggest a few places.

In *The Stone Angel*, despite her self-imposed segregation from her hometown, Hagar's sense of being bound to place kept her rooted in her eroding marriage and shared house with Bram for almost a quarter of a century: "Twenty-four years, in all, were scoured away like sandbanks under the spate of our wrangle and bicker" (116), until her sudden departure to Vancouver, where Laurence creates a new sense of identity for her character, keeping house for Mr. Oatley, an elderly man. Here Hagar was able to regain a deeper sense of connection to place, similar to her feelings towards her childhood house: "Life was orderly, and conducted in a proper house filled with good furniture, solid mahogany and rosewood, and Chinese carpets of deep blue" (SA 158). At this time in her life, in her late forties, Hagar was still healthy and mobile, for her lifespace was still at its fullest possibility. This expansion in Hagar's personal geography promoted an increased sense of self-identity, allowing her the opportunity to disregard unwanted events and settings, evident in her dismissal of her years with Bram when she informed her employer that she "came from a good family" and that her "husband was dead" (SA 158). This place-based memory empowers the elderly Hagar, lending her a false sense of independence at a time when her aged body has removed these feelings from her identity. Henry C. Phelps views Hagar's attachment to place and home as transitory: "her residence is always invested with an air of transience, waiting, and uneasy expectation – 'marking time' ([SA] 160), as she acutely characterizes it" (Phelps 2000, 68), but the possibility of mobility also suggests a sense of freedom that the elderly Hagar still desires.

Ironically, the memory of this escape from Bram and their farm coincides with and triggers the elderly Hagar's escape from her own home in Vancouver, in an attempt to evade entry into a nursing home: "I've taken matters into my own hands before, and can again" (SA 139). She realizes

that she would "never get out. The only escape from those places is feet first in a wooden box" (SA 185). Her view of the Home is completely antithetical to the meaning of the word "home," as a secure place, where one's identity is grounded: "Those places have nothing to do with nursing or homes—the name's all wrong" (SA 221); instead, her perception of the Home is that of a prison, in which she would be a prisoner on death row, living only to die. With Hagar's escape to Shadow Point where she mistakenly believes she can live independently and free, Laurence demonstrates that the elderly Hagar's sense of her independent and viable self is intrinsically linked with the need to claim a place of her own. It is here that Hagar continues to expand her diminished personal lifespace by recalling significant place-based memories of her life.

In sharp contrast with Hagar's need to remember her life in rebellion against shrinking physical lifespace, aging and death, Iris, in *The Blind Assassin*, experiences an urgency to finish her memoir in order to provide her granddaughter with her own true lineage and ancestral memories. Iris links death to an actual place, similar to the locations of her rendezvous with Alex, where she will experience true insideness: "I have to hurry now. I can see the end, glimmering far up ahead of me, as if it's a roadside motel" (BA 623). Iris welcomes death, seeing it as the end in a long journey through meaningful places, sensing a deep sense of insideness attached to this final realm: "*The end*, a warm safe haven. A place to rest. But I haven't reached it yet, and I'm old and tired, and on foot, and limping" (BA 623). Iris has accepted that her world is physically shrinking, but throughout the span of a year she is able to record and reclaim her self-identity through place-based memories. Iris's sense of her own finite life is extended through the act of remembering her life and recording it as a memoir. As Earl Ingersoll writes "the end of Iris's narrating eerily coincides with the end of her life. Iris concludes her living and her narrating in a moment of confidence and resignation: 'But I leave myself in your hands. What choice do I have? By the time you read this last page, that—if anywhere—is the only place I will be' ([BA] 521)" (Ingersoll 2003, np). Transcending death and continuing to live in a new "place" – that of the text of *The Blind Assassin* – the character Iris makes a conscious decision to increase her chances of "immortality."

In *The Stone Angel*, Hagar is eventually hospitalized, her body too weak and sick to survive on its own in an isolated and hostile environment. Here she comments several times how her lifespace continues to diminish, bringing her closer and closer to death: "how the world has shrunk. Now it's only one enormous room, full of high white iron cots, each narrow, and in each one a female body of some sort;" and referring to her space again, she calls it "the shrunken world," that becomes even more restrictive

when she moves to a semi-private room, "The world is even smaller now. It's shrinking so quickly. The next room will be the smallest of all….`Just enough space for me'" (SA 254, 264). Ironically, the narrative structure of Laurence's novel provides flashbacks that illustrate Hagar's attachment to places in lieu of people, yet as Hagar's physical lifespace shrinks drastically, Laurence permits her elderly protagonist several opportunities to understand the value of human relationships and in essence, redeem herself, before her death.

Many critics, including Beeler (1998), Buss (1985), Chivers (2003), Stevens (1993/4), and Osachoff (1979), have commented on the relevance of the hospital scene in which Hagar aids and comforts Sandra Wong, at the expense of her own bodily discomfort, pride, and self-imposed aversion to humanity in general. While laughing with the young woman over a shared joke, Hagar experiences a connection with another human being that had previously been missing from her life. This selfless act enables Hagar to alter the negative emotional legacy she would have left for her son Marvin, as she tells him "You've been good to me, always. A better son than John" (SA 304). After reliving a lifetime of memories in which she alienated people around her and repressed her own emotions, memories in which she demonstrated her deep connection to place, Hagar, her life-space reduced to a "cocoon" in which she is "woven around with threads, held tightly," (SA 306), comments that "I lie here and try to recall something truly free that I've done in ninety years. I can think of only two acts that might be so, both recent. One was a joke…The other was a lie—yet not a lie, for it was spoken at least and at last with what may perhaps be a kind of love" (SA 307). After this sudden and life-altering realization of Hagar's long-denied ability to connect with humanity, Laurence shrinks Hagar's lifespace to the size of a pin-prick, as, heavily dependent on pain-killers, Hagar remarks "The world is a needle" (SA 307). Even at this moment, though, Laurence presents Hagar as believing that she can reverse her diminishing life-space, slip back into a larger place: "I must get back, back to my sleek cocoon, where I'm almost comfortable…I can collect my thoughts there. That's what I need to do, collect my thoughts" (SA 308). Again emphasizing the relationship between memory and identity, Laurence presents the notion that Hagar believes she could continue living in an expanded life-space through her place-based memories for as long as her body stays alive, leaving the reader with the thought that if Hagar's character were to continue her literary life past page 308 of *The Stone Angel*, she might emerge from her "cocoon" with a greater connection to the characters around her.

Concluding Thoughts

Place is that memory laden centre of our lives where we develop our sense of being and understanding of the unfolding of life events. It is grounded against the meanings such events hold for our lives, contextualized by the memories developed from our place in the world. Through the examination of place and the role place has in developing the protagonists' evolving forms of self identity, insideness and outsideness with their changing environments throughout their lives, we can identify a geography of personal identity for these characters. Their personal identities are shaped by their life-space, be that space charged with positive or negative connotations, and the life-spaces are contextualized through groundings in place-based images and memories from events throughout their lives and their geographic selves. Those events set the tone for the protagonists' degree of insideness with their setting, affording them an intimate understanding of the personally value/memory laden nature of 'their place'—both figuratively and literally.

Both Atwood and Laurence succeed in creating two extraordinary characters in Iris and Hagar respectively, characters that faced with the self-realization of their impending mortality, re-examine their lives through narrative flashbacks of intense place-based memories, enabling both characters to reclaim, reaffirm, and reconstruct their personal identities just prior to their 'final place'.

Notes:

1. *The Blind Assassin* still being a relatively new work of fiction, there are few secondary sources available, and of those sources, none offer a treatment of the work within a geographical framework.

2. Academics have examined self-alienation, memory, and place in *The Stone Angel* and in the earlier works of Margaret Atwood, in a variety of combinations and manners over the years, but none of these critical works have been grounded in geographical place theory. Rosalie Murphy Baum analyses Hagar's self-alienation in *The Stone Angel*, based on a psychological perspective (Baum 1996, 153 & 157-8) without specific place-centred influences on the development of Hagar's character. Robert Thacker states that Laurence is "asserting a personal connection to [her] particular place, one that amounts to a conscious

autobiographical creation of [her] geographical home in the writing. [She] captures the sights, sounds, feelings, and people who make the place unique" (Thacker 1997, 135), yet Thacker does not examine how this treatment of place works within the structure of the novel itself and how it influences how Laurence shapes Hagar's character. K. Chellappan, in an article entitled "Time and Place in Margaret Laurence's *The Stone Angel* and T.S. Eliot's *East Coker*: A Comparison," does not define place within the context of geographical terminology and theory, but does offer an analysis of the novel in which "time is given a spatial pattern" explained as "time is both moving and still and space is both still and moving" (Chellappan 1992/3,10) a narrative technique in which "The movement backward is also a movement forward" (Chellappan 1992/3,11). Chellappan partially concludes that "Hagar creates a unified self in relation to time and place" (Chellappan 1992/3,11). Offering another treatment of the role of time and place in *The Stone Angel*, Dolors Collellmir analyses the importance of water "places" in the development of Hagar's character (Collellmir 1999, 1-4) in a non-geographical context, differing from the treatment that we explore in this paper. Alexandra Pett states "Hagar's problem is that she cannot accept the fact that she is old…no one wants to hear her speak or believes that she has anything meaningful to contribute" (Pett 1998, 23), which in turn offers a very viable reason for Hagar to evoke strong memories of her life. Pett focuses on the stages in Hagar's life, rather than the influence of place. Sara Maitland posits that the "flashbacks are not the meat of the novel, they are the incidentals, illuminating, crucial even to its understanding, but they are not allowed to take over from what is really important, only to serve the principal thrust of the whole book—the primacy of the need to claim autonomy and determine the manner of one's own dying" (Maitland 1987, 45) and J.M Kertzer writes that what Hagar "seeks, finally, is self-justification in the face of death" (Kertzer 1974, 499). Arguably, the flashbacks, or place-based memories, are just as essential to the novel as are present-tense events. M. F. Salat in *The Canadian Novel: A Search for Identity,* comments that "The change in Hagar, however limited, emblematizes the possibility of such an altered perspective and thus establishes the validity of Laurence's proposition in regard to the need to relate the past with the present for adequate self-perception" (Salat 1993, 46). *Through* memory, not *in spite of* it, Laurence's Hagar reaffirms her identity and determines how she will face death: by continuing in her belief that she is still a viable person, capable of being any age she wishes, connected deeply to place, and free to escape the confines of her diseased body, all through the mental lifespace of memory.

3. Within the parameters of the work being examined, the society represented herein is but one microcosm of society writ large, and as such reflects the inherent biases presented within place-theory due to its era of authorship. The voluminous literature on urban, social, and cultural differences with respect to notions of 'home', typical socio-economic trajectories, and the various notions of child-parent relations developed since the 1980s are appreciated by the authors, however, they are not included in this paper due to space limitations.

4. In literary criticism, "mise en abyme" is a literary device that uses microcosmic narratives as emblematic representations of the larger structure that contains them. The purpose of the structure is to allude to and explicate the plot of the larger structure within which it is staged. Source: The Literary Encyclopedia, 2007 *<http://litencyc.com/php/stopics.php?rec=true&UID=729>*

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Literary utopias: literal hells?

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Abstract: Literary works suggest that no utopia can exist without geographical barriers to isolate the given society from the rest of the world and, therefore, to protect it from influences that will lead to change. Sir Thomas More's *Utopia* is isolated by water and protective geography. James Hilton's Shangri-La of *Lost Horizon* is hidden in mountains. John Wyndham's "civilized" society in *The Chrysalids* is restricted to the land least affected by nuclear disaster. Lois Lowry's towns in *The Giver* exist only on human-manipulated landscape, in which "Sameness" has been introduced; there are no hills, weather variations or colour. The societies of these four geographically rich works, the main topics of discussion in this paper, resist outside influences to varying degrees, some being more "kinetic," more willing to accept change, than others. Their isolated geographies are major factors enabling them to control which changes occur. However, this control is challenged in some of the works. These four books also assert a second important suggestion about utopias; no place is utopian for all who live in it. Each book has characters that suffer, often as a result of geographic isolation, their suffering ensuring that the perceived utopia will continue for the rest of the characters. These sacrifices imply that the Greek translation of the word utopia, "no place," holds true. A true utopia can never exist, for there will always be someone who finds a situation or environment unpleasant.

Introduction

From the time the story of the garden of Eden was recorded, humans have heard of idyllic lands and cultures and compared them to their own, less desirable, environments. Even in Genesis, in which the world and, therefore, geography itself is created, geography is viewed as merely a backdrop to the morality and obedience lesson in Genesis 3, when Adam and Eve are expelled from Eden. The geography is present; in many interpretations of the garden, Eden has four rivers – Pison, Gihon, Hiddekel and Euphrates; it has an abundance of gold, myrrh and onyx; like most

utopias, it evidently has boundaries, for God drives Adam and Eve out of the garden and blocks re-entry (Snodgrass 1995). Yet despite the abundance of fascinating, rich geography, the landscape is like the wallpaper of a room; more attention is paid to the room's inhabitants and their actions than to their surroundings.

Geography as a backdrop is typical of most utopias. In nearly all criticism of utopian literature, geography is secondary to government, law, social organization and morality, which are all seen as more central to a culture. In his paper on More's work, Goodney (1970) even goes as far as to say: "*Utopia* was not written as a geography. The locale of More's society is almost incidental to the social structure that he describes…" (18).

While the characteristics of a utopia are no doubt affected a great deal by government, law and other factors, geography should not be dismissed as merely "incidental." Generalized studies of geography in utopian literature have been published, but they rarely delve deeply into *specific* works, nor do they compare and contrast the geography of different utopian works. The exceptions to this observation are perhaps classic works such as Sir Thomas More's *Utopia*, which have had time to accumulate criticism in all areas, including geography, although for *Utopia* much of this criticism has centred not around the physical geography of the island but on its location on the globe (Parks 1938; Plank 1964; Goodney 1970; Lakowski 1999a; Lakowski 1999b). Contemporary literature does not appear to have been as thoroughly analyzed for its geography. This paper will consider the importance of boundaries, isolation and resistance to external influences in the works considered and how geography contributes to these elements. It will also consider the static nature of many literary utopias and how this fixed state can lead to some characters in literary utopias to feel that their situation is dystopian. While the geographical argument is not meant to be deterministic, a survey of literary utopias both by extensive reading and consulting of literary anthologies and bibliographies (Snodgrass 1995; Claeys and Sargent 1999) suggested that geography is, more often than not, a major factor in a utopian, or dystopian, culture's development and continuation.

In this paper, Sir Thomas More's *Utopia* (1992), James Hilton's *Lost Horizon* (1962), Lois Lowry's *The Giver* (1993) and John Wyndham's *The Chrysalids* (1955) will exemplify the above elements of geography in utopias. Other works will also be touched on to elucidate points. Where appropriate, a discussion of real world events that inspired the creation of literary utopias, such as the exploration of the Americas and the Cold War will also be considered.

Geography of Utopias

Geographically, utopias can be found on almost any terrain. More's *Utopia*, Defoe's *Robinson Crusoe* (1946), the four lands of *Gulliver's Travels* (Swift 1965) and a litany of others all take place on islands. *Lost Horizon*'s Shangri-La is found on the Asian continent, but in the Tibetan mountains. The prairies of North America, with "boundaries" of seemingly endless open space, were presented in utopian ways in the late 1800s and early 1900s. John Varley's *The Barbie Murders (1980)*, in which an entire colony is identical and ideally beautiful, takes place on the moon. The 1998 movie *Pleasantville* even gets temporally displaced when two teenagers from the 1990's are transported into a 1950's black and white mid-American town with wholesome, "Leave It to Beaver," values. However, in one respect, nearly all utopias and dystopias are similar; they are almost all isolated. "Ever since More described his island Utopia, boundaries, walls, trenches, moats, and a variety of other spatial and temporal barriers have been indispensable features on subsequent maps of utopia," explains Ruppert (1986, 27).

Utopias could not exist without such boundaries, explain Lukermann and Porter (1976). "Utopia cannot survive in proximity to an alternative way of life," they claim (207). Ruppert (1986) echoes this assertion, writing that the function of boundaries is twofold: they protect the society inside the boundaries from outside influence and contamination, but they also "keep docile and unknowing inhabitants within" (27). "In protecting the utopian territory, these boundaries also isolate and insulate it, cutting it off from the rest of human society and transforming it into a static place that seems incapable of change, novelty and innovation," he explains (27). As will be discussed later, the inhabitants of the Valley of the Blue Moon in *Lost Horizon* are ignorant to anything outside their mountain walls, while citizens in *The Giver* have no memories of the past and, therefore, have no alternatives on which to look back. Both of these societies are ignorant of other possible ways of living, largely due to their boundaries.

Utopian societies tend to be isolationist because the influence of other societies can cause change. Change disrupts utopias, which have already attained the ideal. Therefore, to change means to move away from utopia. "Because the consequences cannot be foreseen, any change threatens the equilibrium of a system. In utopia nothing is left to chance. Relations with the outside world, for example, are carefully regulated," explain Lukermann and Porter (1976, 206). This caution can certainly be found in *Lost Horizon*, in which newcomers are welcomed with great hospitality, but are later told that they can never leave, for fear of revealing

the location of Shangri-La (134). Similarly, in *The Chrysalids*, "norms," the people who are not seen as deviations, keep themselves geographically separated from mutants. They believe that allowing mutants into their society would lead to the destruction of the utopia towards which they are working because the gene pool would be contaminated. They are fearful of change that leads them away from their pursuit of returning to what they believe is "The Golden Age" (40). This resistance to change is common among utopias. "Utopias are static, virtually by definition. Having worked so hard to achieve a society in which there are no serious problems, the citizens of utopia want things to stay pretty much the way they are. Change essentially becomes the enemy," says Levy (1997, 53).

However, one character in particular in *The Chrysalids* (Wyndham 1955), the woman from Sealand (New Zealand), insists that it is resistance to change that is dangerous. "The living form defies evolution at its peril; if it does not adapt, it will be broken. The idea of completed man is the supreme vanity: the finished image is the sacrilegious myth," she says (182). While she, a character whom we do not meet face-to-face until the last chapter, lives in a society that accepts evolution, the main characters live in post-nuclear Labrador, Canada, where human "mutants" are banished. This latter society is striving to re-attain the "Golden Age" of the "Old People"; this "Golden Age" is thinly-disguised as Wyndham's real-life Cold War world. The evolutionary views of the Sealanders relate to what has been termed "kinetic" utopias, as opposed to "static" ones (Wells 1905; Partington 2000; Partington 2002). It is not a new way of considering utopias; H.G. Wells discussed kinetic utopias in *A Modern Utopia* (1905), writing that Darwinian influence had led from "static states" of utopia to a new utopian concept in which a utopia "must be not static but kinetic, must shape not as a permanent state but as a hopeful stage, leading to a long ascent of stages" (Wells 1905, 5). Writes Partington (2002) of Wells' insight: "The responsibility of one generation, therefore, is to provide the best opportunities and conditions for the next generation to build upon and succeed, and such a responsibility will rest with all future generations of human beings *ad infinitum*…Unlike all other utopias before *A Modern Utopia*, Wells strives not for material perfection in the here and now, nor for spiritual perfection in the afterlife, but for continuous racial advancement" (65).

The Sealanders of *The Chrysalids* (Wyndham 1995) hold an evolutionary view that all living things move from stage to stage. Says the Sealand woman with whom the main characters are in telepathic contact: "The essential quality of life is living; the essential quality of living is change; change is evolution; and we are part of it. The static, the enemy of change, is the enemy of life, and therefore our implacable enemy." (196).

Even the Sealanders themselves accept that their civilization will be succeeded by another one day (195).

Geography and its related disciplines are some of the reasons that change is always in the future for any society. McConnell (1981) writes, "the environment will inevitably change over the course of geological, cosmological time. And the species that has become too at home in one phase of climate and ecology will probably lose the resiliency to change and meet the demands of another phase" (as qtd. in Partington 2002, 67).

Utopias written in the 1900s after the concept of the kinetic utopia was born often maintained the static tradition. However, as will be discussed throughout this paper, these utopias often had dystopian currents related to their rigid natures. Father Perrault, High Lama at Shangri-La in *Lost Horizon* (Hilton 1962), claims that their society is flexible, pointing to their use of an airplane to kidnap new residents as evidence that even their isolated enclave evolves. He says that "…we must move with the times, you know, even at Shangri-La" (138). This statement could be intended as ironic, at least by the author, since Father Perrault created Shangri-La because he has foreseen that a horrible war, in which flight will play a major role, will destroy everything beautiful in the world. Therefore, he and the other residents amass and protect art, books, knowledge and other things of beauty, including people of many different ethnic backgrounds, at their hidden home. He explains to Conway, the protagonist to whom he bequeaths Shangri-La when he dies, "We may expect no mercy, but we may faintly hope for neglect. Here we shall stay with our books and our music and our meditations, conserving the frail elegancies of a dying age, and seeking such wisdom as men will need when their passions are all spent. We have a heritage to cherish and bequeath" (145). As will be discussed later, Father Perrault hopes they will be successful due to the fact that the lamasery is so isolated. He believes that when the war ends, "…a new world [will stir] in the ruins, stirring clumsily but in hopefulness, seeking its lost and legendary treasures. And they will be here, my son, hidden behind the mountains in the valley of the Blue Moon, preserved as by miracle for a new Renaissance…" (181). His hope to preserve art and knowledge is similar to how the Waknuk people in *The Chrysalids* (Wyndham 1955) are trying to re-acquire all of the knowledge possessed by the Old People. Using *The Bible***,** the one book that survived "Tribulation," a disaster which the reader recognizes as nuclear war, they try to rebuild the Old People's civilization. Were they to find a secluded place where the knowledge and art of the Old People had been preserved, such as a Shangri-La, they could very well be eager to use it to re-build their world and, one might worry, make the same errors.

The world of *The Giver* (Lowry 1993) is perhaps the most static and controlled of those considered in this paper. Any proposed social change in society goes to a "committee" which will consider the change; it is a running joke in the community that "the committee members would become Elders by the time the rule change was made" (14). The community cannot adapt to anything new – when a plane unexpectedly flies overhead, simply because its pilot lost his way, citizens stop all activity and chaos takes over until the airplane is explained (2). They are incapable of change because of their society's choice to have their Receiver, the protagonist Jonas's mentor, hold all of their community's memories – for instance of war and planes. Only The Receiver has the ability to deal with the unexpected; he provides guidance to the community. This particular arrangement will be discussed later in this essay. At the moment, it is enough to note that Jonas's community starts to move from static to kinetic at the end of the book, when Jonas flees the community and the memories which he holds are no longer imprisoned in his mind as his distance from the community increases. As he crosses the bridge over the river, a physical boundary for the community, he looks back and reflects; "At dawn, the orderly, disciplined life he had always known would continue again, without him. The life where nothing was ever unexpected. Or inconvenient. Or unusual. The life without colour, pain, or past" (165). His departure will change that stagnant scene. He can only hold the memories, and protect people from the feelings they carry, as long as he lives in the community. By leaving, he forces change onto his community; he obliges them to acquire wisdom.

Thomas More's *Utopia* (1992) was written in 1516, long before the concept of kinetic utopias consciously existed in literature. The society is largely static in its organization but it does have a few kinetic elements. Perhaps most notably, the Utopians welcome outsiders and have even adopted a few technological advances from visitors. In this way, the Utopians do not follow the more common isolationist natures of many utopian societies. They embraced some knowledge, not identified specifically by More, when Romans and Egyptians arrived in their land 1,200 years before *Utopia's* character, Hythloday, visited the land (30). Then, when Hythloday arrived, the society learned how to make paper from him (59). As More writes it, Utopians are not affected by the vices of any visiting culture; they only adopt that which is useful and beneficial. Says Hythloday of this adaptability: "The willingness to learn, I think, is the really important reason for their being better governed and living more happily than we do, though we are not inferior to them in brains or resources" (30). Since More's *Utopia* is generally regarded as a static society, and Wells (1905) criticized it for being such, such evidence of the kinetic should be mentioned. However, the society's ability to screen out

the bad from the good is perhaps unrealistic. Utopians trade with other societies, establish colonies off their island and receive government delegations from elsewhere. Any visitor to the island who has traveled is warmly welcomed because the Utopians "love to hear what is happening throughout the world" (59). One wants to ask why and how Utopia's citizens are so curious and yet so unshakably resistant to outside influence? More presents an island society that, while geographically isolated from the outside world, still has a lot of contact with other cultures. Perhaps he wants the reader to conclude that the Utopian civilization is so superior to these other societies that no citizen would see another place as better; however, this paper will later discuss characteristics of *Utopia* that might drive at least some Utopians to want change.

Utopias and Dystopias on the Prairies

There are, however, also utopias which are mostly nostalgic visions of people displaced in today's society, as for example, aboriginals on the prairies. Added to these people wistful for a past gone forever, are people duped into coming to a geographical heaven which turned into a living hell for some unprepared prairie immigrants. Before the abovementioned works are given in-depth consideration, utopian works set on the prairies can be considered in order to discuss the boundless open space of this North American region. The seemingly endless land of the prairies in the middle of a continent provides the geographic isolation for utopias and dystopias in this setting.

Before Europeans came to North America, Native North Americans had already created their own utopian ideas based on the prairies. These stories were not in written form, but rather were oral. For example, just as the creation story of the biblical Eden has utopian elements, so too do many North American Aboriginal creation stories. In *The Garden of the Manitou*, Symons (1973) puts in writing a story told to him by "the last great Medicine Man of the Cree," Morning Star. The story tells of the creation of the prairie by the spirit Weesahkahchak who said, "this shall be a prairie and a grassland and a pasture. This shall be the Garden of the Manitou. It is good." (as qtd. in MacDonald 2007, 74). This story explains that, for a time, humans lived in harmony with nature, sharing and taking only what they needed. However, this harmony was broken when the people of the "pale visage," Europeans, arrived and declared "a war against the garden" (74).

Other Native North American stories also suggest that the arrival of Europeans disrupted a sort of utopia. The Medicine man and prophet, Black Elk, had a real-life utopian vision for his Sioux people that was overcome by the European presence. His orally transmitted book, *Black Elk Speaks*, is sometimes referred to as a North American Indian bible (Snodgrass 1995). It describes the birth of his utopian dream through visions in his childhood, as well as the dissolution of the dream in his later years.

Cuthland (1996), a modern-day writer, illustrates the contrast between freedom on the prairies and today's lives of aboriginals in her poem "Four Songs for the Fifth Generation," which depicts four generations of her people. MacDonald (2007) comments on her depiction of pre-European Plains Indian life as "a Golden Age of harmony with nature" (10). Cuthland writes:

> They [the buffalo] were our life the life
> of the prairies
> We loved them
> And they loved us
> (as qtd. in MacDonald 1997, 10)

In terms of geographic boundaries, a topic of discussion in this paper, the ocean was a vast boundary between North America and Europe; once that boundary was breached by ocean-crossing ships, the ways of life, utopian or not, of Native North Americans were threatened.

While some Native North American literature describes the arrival of the Europeans as the end of a Golden Age, for the arriving Europeans, North America represented a possible utopia. It should be mentioned that part of this utopian view was formed not through literary works but through immigration propaganda literature that romanticized the prairies (Rees 1988). Much can be said about this topic; just one example is the forbidding by Clifford Sifton, Minister of the Interior (1986-1905) of any reference to cold or snow in government publications (15). From omissions to outright lies, this propaganda led many immigrants to have unrealizable expectations of a near utopian land. This disillusionment is evident in literary works. For example, in Mary Hiemstra's *Gully Farm*, skeptical colonist Sarah Pinder contrasts with her optimistic husband, Walter, who has read immigration propaganda and sees the Canadian West as "the chance of a lifetime" (as qtd. in MacDonald 2007, 3). Sarah says of dissatisfied pioneers: "What did they expect in a new country?…Milk in the streams, and butter on the

bushes?" (3). Indeed, many immigrants expected the extraordinary, because the geography of the prairies had been misrepresented to greater and lesser degrees by a great deal of the information available to prospective immigrants in Europe.

More's Utopia

In More's *Utopia* (1992), no one is duped into coming and staying. His utopia is in full bloom when he lays out its geographical boundaries. This literary work catapulted the term "Utopia" into common vocabulary. "Utopia" is a combination of the Greek *ou* and *topos*, meaning "no place" (3). Translator Adams also suggests it may be a pun on *eutopos*, meaning "good place" (3).

In Book Two of *Utopia*, More lays out the geography of his fictional land in a straightforward manner. While there is much to be said about urban geography, the intent here is to concentrate on the significance of Utopia's physical geography. The island of Utopia is "two hundred miles across in the middle part where it is widest, and is nowhere much narrower than this except towards the two ends. These ends, drawn toward one another as if in a five-hundred-mile circle, make the island crescent-shaped like a new moon" (31). It is important to note the symbolism built into this geography. First, the island is in the shape of a womb. Therefore, the connotation of the birth of a more just society is provided. The description of Utopia as a "new moon" also appears to be symbolic of birth. Again, More may be intending readers to connect Utopia with hope for the existence of an idyllic land – an escape from England. After all, More could have easily identified Utopia as a "waning moon, about to fade to black," but the romantic, appealing, hopeful connotation would then, of course, be utterly obliterated. Instead, it would have suggested a wilting society past its Golden Age.

The moon-shaped island forms a bay which conveniently provides Utopians with a quiet, smooth, lake-like water body. This bay also provides protection, for its entrance is bordered by rocks and shallow waters and is loaded with underground rocks that are difficult to navigate around; only Utopians are able to find their way to the inner bay. Therefore, the interior of Utopia is safe from invasion by water. Hythloday, the narrator of the story, suggests that the island may have once been part of the continent until King Utopus, the conqueror of the land, "brought its rude and uncouth inhabitants to such a high level of culture and humanity that they now excel in that regard almost every other people," and then "cut a channel

fifteen miles wide where their land joined the continent, and caused the sea to flow around the country" (31).

One interesting geographic choice made by More is to create numerous similarities between Utopia and his homeland of England. The most obvious parallel is in the size of the islands. As previously mentioned, Utopia is two hundred miles wide, similar to that of the British Isles; it is approximately two hundred miles from the Norfolk coast of East Anglia to the northern part of the British border with Wales. Second, the description of the coastline of Utopia is similar to England's. For instance, both have the remains of coastal castles used for defense and "guarded river and bay entrances" (31). Third, the channel that separates Utopia from the continent certainly has a counterpart in England: the English Channel. The Utopian channel is fifteen miles wide while the English channel, at its most narrow, is twenty-one miles wide (19). Erasmus, a friend and fellow writer of More's, indicated that More consciously based Utopia on England. Perhaps More, who many believe intended *Utopia* to be a satire on life in England, wanted to provide obvious geographical clues to readers that had England taken another path, it could resemble his fictional island paradise.

Since More's work was written, scholars and general readers alike have tried to pinpoint the exact location of Utopia. Amusingly, Utopia has proven to live up to its Greek meaning of being "no place." No consensus has been reached as to the "real" location of Utopia (or where More intended it to be).

One common view is that Utopia was inspired by the tales of exploration to the Americas, which were discovered less than twenty-five years before *Utopia* was published (viii). "Naïve folk of the early sixteenth century swallowed More's account of Utopia as a fair description of the New World," writes translator and editor, Adams (viii). However, other scholars dispute this assertion.

Lakowski (1999) challenges the view in two essays which argue that "India and Ceylon in particular served as prototypes for the fictional geography of Utopia" (1). He provides numerous points, some of them stronger than others. For instance, he points out that Hythloday tells that the Utopians had come in contact with the Romans and the Egyptians. "He cites an incident in which a ship, manned by Roman and Egyptian sailors had been shipwrecked on the coast of Utopia twelve hundred years beforehand," (8). This geography would certainly suggest that the Romans and Egyptians had traversed the Indian Ocean, rather than the Atlantic.

A third point of view is presented by Parks (1938) who, before reaching a conclusion, considers many points of view of Utopia's location, including

the possibilities that it was north, south or west of Brazil, Hythloday's original landing place. Through his analysis, he concludes that Utopia could be best located in the East Indies. He argues that, since Hythloday's numerous boat voyages after he left Brazil were relatively short (such as the 500 mile trip from Utopia to the land of the Zapoletes), they imply a chain of islands, such as the East Indies. Parks further explains his conclusion through the use of classical geography, which divides the earth into five zones, "two polar, two temperate and one tropical" (234). Classical geographers believed that the zone in which a society is found determines its level of civilization. Tropical societies were savage while temperate ones were "civilized and intelligent." With his knowledge of human populations in the northern hemisphere, More mirrored the classical belief onto the southern hemisphere. "Now that the south temperate zone was known to be inhabited, More boldly concluded that it must be inhabited by civilized peoples," explains Parks (235), labelling this projection as "climatic symmetry" (236). Moreover, he effectively supports his argument by describing the evolving styles of boats on which Hythloday travelled as he moved, presumably, to higher latitudes. In the sub-tropics, boats were primitive, "flat-bottomed and furnished with sails of wicker or even leather." Later, they were "ridge-keeled." Finally, they were "like ours" (236). These advancements in technology corroborate the classical view.

Of the four works to be discussed, *Utopia* has the fewest dystopian elements. Through his writing, More makes a strong case for his fictional land being more desirable than its real-life counter-part, England. People only work six hours a day, money does not exist and so does not cause conflict, nobody is poor or homeless and freedom of religion is allowed. Despite the many wondrous social conditions, slaves are still present in More's Utopia, and they are the main example of Utopian residents for whom the land would not be ideal (not that More necessarily meant their existence to be a criticism, given the time period). Slaves are "kept constantly at work, and are always fettered" (59). In addition, they wear chains and jewelry of gold, a "mark of disgrace" in utopia. However, these slaves were not born into slavery; they are prisoners of war, former citizens who committed crimes, or "men of other nations who were condemned to death in their own land" (59). The latter in particular *almost* makes this slavery an act of compassion on the part of the Utopians.

However, later criticism of *Utopia* has pointed out other less ideal characteristics of the land. For instance, Adams remarks that "More is rather less than generous to women" (38); they not only have full-time jobs in Utopia, but also continue to be responsible for all of the cooking, cleaning and child care that English mothers in More's time would have

done. Comments Adams, "if it doesn't constitute 'work', that word must have a very special meaning" (38). Further feminist critique would also note the patriarchal nature of the Utopia, in which "wives are subject to their husbands" (41).

The high level of state control, such as the requirement of a letter from the prince in order to travel outside of one's district (45), and the fact that residents are required to switch homes every ten years in order to avoid pride (34) also seem less than ideal when one considers them from a 2007 perspective, when freedom is treasured.

Lost Horizon

Hilton's Shangri-La in *Lost Horizon* (1962) is not isolated by water as Utopia is, but its verdant valley and mountaintop lamasery are just as effectively isolated by mountains. Plank (1964) explains that the placement of utopias changed over time, shifting from predominantly islands to other isolated terrains, such as Shangri-La's valley, because the oceans became too well-explored to believably conceal societies. "The contrast between the peaceful level floor of the valley, with its smiling landscape and luxuriant vegetation, and the bare and forbidding mountains surrounding it has an even greater power to stimulate a certain mood," he says (45). Therefore, in losing islands as a convincing location, utopian authors did not necessarily lose effectiveness.

The story opens in 1932 with the four central characters in the story, Hugh Conway, Charles Mallinson, Henry Barnard and Miss Roberta Brinklow, fleeing from a less than Edenic environment – they are leaving Baskul, India, on a plane, because the revolutionaries in the city are taking foreigners hostage. However, their plane is high-jacked and crashes in the Himalayan mountains. Were it not for a group of monks that meets them on the chilly terrain and leads them to the oasis lamasery of Shangri-La, they would not have survived. Here, they are offered great hospitality in a luxurious setting with modern conveniences such as heat and warm baths, a library stocked with books (including Thomas More and, presumably, *Utopia*, a deft bit of foreshadowing) and nearly everything else one could want. The reader even later learns that Shangri-La residents have prolonged lives; Father Perrault, with whom Conway kindles a friendship, is 251 years old.

When the quartet of foreigners first arrive near Shangri-La, Conway, an experienced mountaineer, estimates that they had been marooned in the lesser known heights of the Kuen-Lun, a mountain range on the

northern edge of the Tibetan plateau. He muses: "In that event they would by now have reached the loftiest and least hospitable part of the Earth's surface, the Tibetan plateau, two miles high even in its lowest valleys, a vast, uninhabited, and largely unexplored region of the wind-swept upland" (Hilton 1962, 49). In fact, Conway compares their predicament to that of someone marooned on a desert island, concluding they were "in far less comfort than on most desert islands" (49). This craggy wilderness of ice, snow and wind does not appear to be a landscape that could harbour a utopia. Nevertheless, the geography of Shangri-La appears to be just that.

The first geographical feature that should be considered is Karakal, the mountain that entrances Conway from his first glimpse of it. He describes it as: "the loveliest mountain on Earth. It was an almost perfect cone of snow, simple in outline as if a child had drawn it…It was so radiant, so serenely poised, that he wondered for a moment if it were real at all" (47). Karakal, which dominates the view from Shangri-La, is presented in a way fitting to the Tibetan belief in harmony and balance. It reminds one of the revered, relatively symmetrical Mount Fuji, or the pyramids of Egypt. According to the group's guide, Chang, it is more than 28,000 feet high. This measurement places it only 1,000 feet below the height of Mount Everest, 29, 035 feet (Encarta). Finally, the word Karakal, in the dialect of the people who live in the Shangri-La valley, means "Blue Moon" (75). This translation has a direct link with the idea of utopia. "Utopia" is a combination of the Greek *ou* and *topos*, meaning "no place" (More 3). Therefore, just as a blue moon is viewed as a very rare event, so too is utopia unlikely, if impossible, to find.

The natural fortifications and protection of Shangri-La are also wonders of geography. The aforementioned surrounding terrain of inhospitable Tibetan plateau and mountains provide the first and most obvious barrier to intrusion from the outside world. Second, the single, hidden and dangerous route to Shangri-La means that it is difficult to find the lamasery without knowing its exact location. Guided by the lamas who lead him to the lamasery after the plane crashed, Conway trudges up and down steep slopes and along narrow paths bordered by deep abysses and remarks "It's quite certain we could never have found our way here by ourselves" (59). This concealment, the reader later discovers, is a geographical factor which pleases the lamas very much. In a discussion concerning the future of Shangri-La, Father Perrault tells Conway "there was no need to fear invasion by an army. That will never be possible, owing to the nature and distances of the country" (131). In fact, Perrault reveals that the lamasery hopes to weather the destruction of the world from its secluded location. Having dreamed of a future where men, "exultant in a technique of homicide, would rage so hotly over the world that every precious thing would be in

danger," he hopes that geographic isolation will enable Shangri-La to be sheltered. "The airman bearing loads of death to the great cities will not pass our way," he says (181).

Another geographical feature is the valley that supports the lamasery built on a cliff. When Conway visits the valley, he describes it as "nothing less than an enclosed paradise of amazing fertility, in which the vertical difference of a few hundred feet spanned the whole gulf between temperate and tropical" (97). In the middle of the uninviting mountains, "crops of unusual diversity," such as mangoes, are grown on the lush valley floor. Conway notes that the crops are fed by streams and rivulets flowing from glaciers and marvels at the natural and perfect geographic design. "But for some chance-placed barrier, the whole valley would clearly have been a lake…the whole design was almost uncannily fortunate," he says. It is interesting to note that the agriculture appears to be quite unsustainable. "There was not an inch of ground untended. The whole cultivated area stretched for perhaps a dozen miles,…and, though narrow, it had the luck to take sunlight at the hottest part of the day," describes Conway (97). Yet, in spite of this intense cultivation, the valley has apparently supported inhabitants since before Father Perrault arrived in 1719. Therefore, the valley appears to be a prolific garden of Eden, with perfect soil, sunlight, climate and water supply, that will not be exhausted. A final note should be made that gold is found in the valley in large amounts. However, like More's inhabitants, the residents do not clamour to stockpile the wealth. Instead, they use it to order from outside simply that which they need.

Shangri-La may be edenic for those born in the valley; most of them, known as the people of the Blue Moon, are aware of nowhere else. Father Perrault explains: "… they know nothing of such countries as France or England or even India – they imagine the dread altiplano stretching, as it almost does, illimitably. To them, so snug at their warm and windless levels, it appears unthinkable that any one inside the valley should ever wish to leave it; indeed, they picture all unfortunate 'outsiders' as passionately desiring to enter" (178). This unawareness is a bit disconcerting, for the lamas of Shangri-La could easily share their knowledge of the world with the valley inhabitants. However, since the inhabitants appear to be genuinely happy, it is hard to seriously criticize this arrangement.

More disturbing is that newcomers who do not like Shangri-La are not permitted to leave. The lamas fear that if they permit people to leave, Shangri-La could be faced with an influx of people seeking prolonged youth or, perhaps even more likely, the large amounts of gold in the valley. The character of Mallinson most strongly demonstrates this dystopian undertone. Rather than finding the geographic seclusion relaxing and

secure, he finds it far too isolated. As noted by Ruppert (1986), "One person's utopian dream turns out to be another's nightmare" (98). When he first arrives, Mallinson refers to Shangri-La as a "hell's kitchen" (Hilton 1962, 60). His uneasiness about the place grows throughout the novel; he implies that Shangri-La is not part of civilization (55, 71), refers to their situation as "nightmarish" (61), calls it a "prison" and compares himself to "a monkey in a cage" (166). Mallinson feels that the uncertain, war-torn world he left behind is preferable to Shangri-La. "A lot of wizened old men crouching here like spiders for any one who comes near…it's filthy," he says (192).

Of the four people who arrived on the airplane, Mallinson is the only one who does not wish to stay. Barnard is happy about the isolation because he is wanted for embezzlement throughout the world, Mrs. Brinklow is determined to convert the natives and Conway enjoys the harmony and peacefulness after being broken in World War One. However, Barnard and Brinklow do not yet realize that their hiatus from the "real world" is life-long.

It is clear that Shangri-La has had many unwilling residents. Father Perrault is pleased with Conway's calm acceptance of the rule, saying: "My revelation has been greeted in almost every conceivable manner – with indignation, distress, fury, disbelief, and hysteria – but never until this night with mere interest" (139). He also admits that not all people gain from living at Shangri-La, saying of Mallinson's unhappiness: "we do not and cannot guarantee success; some of our visitors derive no benefit at all from their stay here…"(137). He accepts that some people will find Shangri-La unpleasant. It seems rather callous for Perrault to simply dismiss such residents. According to Chang, some residents take twenty years to be "reconciled" to the situation – a rather long time, whether one's life is unnaturally extended or not. Again, the reason people such as Mallinson are forced to stay is that the lamas fear someone who was permitted to leave could cause problems for the lamasery. Their concerns may be well-founded; Mallinson tells Conway, "My God, I'd give a good deal to fly over with a load of bombs!" (192). Nevertheless, a society that has even one inhabitant who is so unhappy is not a true utopia.

Shangri-La is not alone in having unhappy residents. Yet some utopias are specifically built on the premise that one must suffer for all. *The Giver* (Lowry 1992), the next book to be discussed, is an example of a society in which one person suffers in order for the rest to be content.

The Giver

Shangri-La relied on the natural fortifications of mountains to protects its secrets. However, there is nothing natural about the geography in *The Giver* (Lowry 1992). It is a novel in which humans have deliberately altered the landscape in order to create what they perceive as utopia. When he is twelve years old the protagonist, Jonas, is selected to be trained as the community's Receiver – the person who holds generations of memories so that no other citizen will have to feel pain, sorrow or fear. Without memories, history or feelings, the lives of people in the community are as uneventful as possible; their careers are chosen for them, they take medications to repress sexual urges and they do not know what love is.

The man-made geography of *The Giver* has no distinctive geographic features at all. Hills and mountains have been levelled. In addition, climate is controlled so that there is no rain, snow, sunshine or weather whatsoever. The protagonist, Jonas, lives in a community where only he, the Receiver of memory in training, and the Giver have concepts of geography and climate. Geography as we know it exists only in the memories held by these two people. All other residents are ignorant to the fact that landscape, weather and colour can vary. In fact, when Jonas begins his training, he does not know the meanings of the words "hill," "snow"(81) and "sunshine" (85). Only when the Giver provides him with memories of geography and weather does Jonas begin to recognize the vast topographies and climates possible. For instance, a memory he is given of sliding down a hill on a sled introduces him to the concepts of snow and hills. When he first sees a hill in memory transferred to him by the Giver, it is described as "a long, extended mound that rose from the very land where he was" (81).

This human control over landscape, explains the Giver, is called "Sameness," a manipulation which, in the view of its creators generations ago, created an ideal, comfortable life. The Giver explains:

> "Snow made growing food difficult, limiting the agricultural periods. And unpredictable weather made transportation almost impossible at times. It wasn't a practical thing, so it became obsolete when we went to Sameness…And hills, too. They made conveyance of goods unwieldy. Trucks; busses. Slowed them down" (84).

In addition, this "Sameness" led to a loss of colour. "We relinquished colour when we relinquished sunshine and did away with differences," explains the Giver. "We gained control of many things. But we had to let

go of others" (95). Therefore, Jonas's community has no weather, no hills and no colour. There is as little distinction as possible in the landscape. Ironically, people rarely leave the community, so the sameness of geography does not appear to be particularly useful. People can only leave the community "on official business," to go to another community with the similar sets of boundaries or on occasions when children from one community visit those in another, who are part of the same utopia anyway. Nevertheless, the geography of the communities reminds the reader not of a stereotypical edenic utopia, but of the prairies, now with colourless fields replacing golden stretches of wheat and with a bland sky replacing a blazing blue one. Jonas lives in this dull, lifeless landscape with no vibrancy or variation. He describes: "…the land beyond the bridge was much the same, flat and well ordered, with fields for agriculture. The other communities he had seen on visits were essentially the same as his own, the only differences were slightly altered styles of dwellings, slightly different schedules at school" (106). Sameness is equated with security; variety would introduce a risk of emotion and yearning that cannot be tolerated if a human is to be untroubled. Hence, even geography must remain bland. Jonas pays the price of this utopia by holding horrific memories; utopia for him becomes hell.

Only when at the end of the book Jonas flees the community, both to force the community to share the burden of memories and to save the life of an infant deemed "inadequate" and, therefore, slated to be killed, does he experience varied geography for himself. Forests grow on either side of the now untended road and he sees wildlife such as birds and deer (Jonas had been raised to believe they were mythical creatures). For the first time, he encounters streams and waterfalls. This natural landscape illustrates what a starved life he has led geographically and also indicates one element of the dystopia; readers may ask themselves "would I be willing to give up geography, weather and variety, even if it made my life safer and more secure?" Jonas reflects: "During his twelve years in the community, he had never felt such simple moments of exquisite happiness" (172). However, Jonas also discovers the natural hazards of climate, as he is numbed and weakened by a blizzard and appears to die (175)[1]. It is common for utopias to have ideal climates; once Jonas left his home, he was no longer under utopian protection. "The climate of a utopia generally seems to be either an equable given or something totally under man's control. Extreme environmental events are done away with; nature catastrophes do not occur," write Lukermann and Porter (1976, 210). While Lowry presents the human control of climate and geography as bland, she does not ignore the risks of natural hazards outside of utopia.

The pain that Jonas and The Giver must endure in order for the rest of the community to remain comfortably naïve is the strongest dystopian element in Lowry's book. When Jonas asks the Giver why the entire community does not share the memories, he is told "…then everyone would be burdened and pained. They don't want that. And that's the real reason The Receiver is so vital to them, and so honoured. They selected me – and you – to lift that burden from themselves" (113). The Giver explains to Jonas that the memories consume the life of the Receiver – "…here in this room, all alone, I re-experience them again and again… I am so *weighted* with them, " he says (78). He cannot leave this tortured life. He cannot leave the community; it is not permitted. Travel outside of the community is closely monitored and so nobody can easily leave (although most people are so well-programmed and conditioned that it would not occur to them to leave); when Jonas escapes, he is pursued by heat-seeking planes. The Receiver cannot even ask to be "released," a form of euthanasia permitted to all other residents – although most residents do not know that "release" means death. To them, it simply means going "elsewhere." The ethics of "release," which is also a punishment for rule-breakers, is yet another dystopian characteristic.

The sacrifice of The Giver – one within a community of hundreds – is similar to the suffering of the naked, confused, underfed and unloved child in Ursula Le Guin's short story, "The Ones Who Walk Away from Omelas" (Pojman 2000). This child's misery allows the utopia of Omelas to exist. The citizens of Omelas know of the child, and some people visit its locked, unlit room once in their lives in order to understand how their happiness is sustained. However, while the citizens in Jonas's village are unaware that The Receiver suffers for them, the residents of Omelas are very aware, and feel very guilty, that this child is responsible for their wealth. Writes Le Guin: "They would like to do something for the child. But there is nothing they can do. If the child were brought up into the sunlight out of that vile place…all the prosperity and beauty and delight of Omelas would wither and be destroyed. Those are the terms. To exchange all the goodness and grace of every life in Omelas for that single, small improvement: to throw away the happiness of thousands for the chance of happiness of one…" (267).

The Chrysalids

Unlike the society in *The Giver*, which willfully altered its landscape, Wyndham's dystopian world is a result of humans unwittingly changing

geography with nuclear weaponry. It is a novel born out of Cold War fear. Set in a future where nuclear weapons have rendered landscapes nearly unrecognizable and wiped out nearly all records of human history except for the Bible, it presents readers with a fundamentalist people living in Waknuk, Labrador, who are insistent on re-creating the "Golden Age" that once existed. Ignorant of the nuclear disaster, they believe the humans were punished by God through "Tribulation," much like the expulsion from Eden and the Flood were punishments. Waknuk inhabitants shun anyone who does not reflect what is believed to be God's image: one body, one head, two arms, two legs, hands on the end of each arm and five fingers on each hand. Anyone "different" is labelled "deviant" and called an "abomination." However, David, the protagonist, as well as his cousin Rosalind and numerous other Waknuk children are invisibly deviant; they practice telepathy. Their ability makes their lives difficult and dangerous. It requires them to be always on guard to not reveal that they are different. David describes their frustration: "We had a gift, a sense which…should have been a blessing, but was little better than a curse. The stupidest norm was happier; he could feel that he belonged. We did not, and because we did not, we had no positive – we were condemned to negatives, to not revealing ourselves, to not speaking when we would, to not using what we knew, to not be found out – to a life of perpetual deception, concealment, and lying" (86).

When they are discovered, they must flee to the Fringe country, a land with high radiation to which all other deviants are sent. As they are on the run, David's sister, Petra, who has extraordinarily strong telepathic powers, is in touch with a woman from Sealand (New Zealand), who says she is coming to rescue them and take them to her home, where everyone is telepathic.

The isolated Labrador has been spared total destruction and now its residents seek to rebuild what they think of as utopia based on their understanding of the "Old People." It is a bizarre path they travel for they wish to recreate the situation which has already once all but annihilated the planet. In a country that is really hellish, they seek to go back to old technologies rather than use what they have for a new world.

Labrador can be broken down into four general geographic regions. First, David lives a community called Waknuk, in which radiation is relatively low and deviations can be controlled by destroying "offences," such as two-headed cattle. The agrarian community has about one hundred scattered holdings, surrounded by fields and pasture lands. The other three regions spread out from Waknuk. Thirty miles to the south or south-west of Waknuk lies the Wild Country, where there is a less than fifty per cent chance that breeding will be "true" (20). This area is frontier country;

a region which is widening as radiation decreases, thereby slowly allowing for settlement. Third, there are the Fringes, some fifty miles from Waknuk, where nothing breeds true. It is to the Fringes that "abominations," people who do not appear to be in "God's image," are banished. From a human geography standpoint, a considerable percentage of the Waknuk population moves to the Fringes in an ongoing forced migration, a "permanent movement compelled usually by cultural factors" (Rubenstein 2005, 518). For instance, David's own uncle was sent to the Fringes. When David and Petra are discovered as mutants, they, too, must flee to the Fringes.

Within the Fringes, no classification of vegetation can be made, as David learns when puzzling over the plant life.

> "There were familiar trunks supporting the wrong shape of tree: familiar types of branches growing out of the wrong type of bark, and bearing the wrong kind of leaves…In another place a stretch of ground looked like a dried-out river-bed full of large boulders, but the boulders turned out to be globular fungi," he observes (152).

A fringes resident explains to David that anything can be expected from the vegetation. "None of it's like any other part. That's why the Fringes is the Fringes; pretty near nothing grows true to stock here," he explains (152). Today, the dominant biome in Labrador is taiga coniferous forest and the three ecozones present are the taiga shield, the boreal plains and the arctic cordillera (Draper 2002, 60-61). However, with such uncertain vegetation in the Fringes, classification does not appear to be possible.

The fourth geographic region is the Badlands, which begins in parts of Labrador and extends far beyond. It is a land where radiation is so high that mutations are grotesque or cannot survive at all. There are several characters who provide information on these lands. First, David's Uncle Axel describes accounts he has heard from sailors of the worst of the badlands, also called the wastelands:

> "The whole seaboard is empty – black and harsh and empty. The land behind them looks like a huge desert of charcoal. Where there are cliffs they are sharp-edged, with nothing to soften them….And yet it can't always have been like that because there was one ship whose captain was foolhardy enough to sail close inshore. Her crew were able to make out great stone ruins. They were all agreed that they were far too regular

> to be natural, and they thought they might be the remains of one of the Old People's cities"(60).

It is here important to note that, in this post-nuclear world, explorers appear to be geographers. Other people are fearful of travelling outside of "safe" territory; rumours and propaganda about geography and dangerous inhabitants in the Fringes and badlands abound, effectively keeping norms in their little enclaves – isolated, as in the majority of utopian or dystopian societies. Still, Uncle Axel also learned about badlands through the journals of a sailor called Marther who described the coastline on one of his voyages:

> "The Black Coasts would appear to be an extreme form of Badlands. Since any close approach to them is likely to be fatal nothing can be said of them with certainty but that they are entirely barren, and in some regions are known to glow dimly on a dark night" (61).

The second witness to the Labrador badlands is the telepathic Sealand woman, who flies over them en route to rescue David, Petra and Rosalind. She expresses dismay at the devastated landscape.

> "There are stretches, miles across, where it looks as if all the ground has been fused into black glass; there is nothing else, nothing but the glass like a frozen ocean of ink…it's like going over the rim of the world and into the outskirts of hell…The mountains are cinders and the plains are black glass – still, after centuries!" she laments (179).

It is apparent from her description that the heat from nuclear blasts has turned the landscape into metamorphic rock, as well has altered the topography of the land by reducing the size of mountains and hills. From her description, it appears that human impact on the environment in some places may be irreversible.

The woman's home, Sealand, has escaped the brunt of nuclear destruction. Sealand can quite easily be identified as New Zealand. Aside from the obvious similarity in name, it is described as two secluded islands, a geography which matches New Zealand's. Second, it is in the eastern hemisphere; David is confused when the woman projects an image of the city in the daytime when in is nighttime in Labrador. Since geography is in its dark ages in Labrador and the humans living there are not even sure if

the earth is round or flat, David has no sense of hemispheres. However, to the reader, the identification is obvious.

Sealand offers a second utopia in *The Chrysalids* that contrasts with the rigid utopia that the Labrador people are striving for. While the Labrador "utopia under construction" is rural, the Sealand one is urban. Its description is not so unlike that of a well-planned city today:

> "A brighter sun than Waknuk ever knew poured down upon the wide blue bay where the lines of white-topped breakers crawled slowly to the beach. Small boats, some with coloured sails, and some with none, were making for the harbour already dotted with craft. Clustered along the shore, and thinning as it stretched back towards the hills, lay a city with its white houses embedded among green parks and gardens. I could even make out the tiny vehicles sliding along the wide, tree-bordered avenues. A little inland, a bright light was blinking from a tower and a fish-shaped machine was floating to the ground" (199).

Interestingly, this city does not vary greatly from cities in the 20th century. There are boats and automobiles, a lighthouse to guide in aircraft and sprawling residential areas. Still, the city has qualities which are idyllic and not necessarily found in abundance in all of today's cities. White houses symbolize cleanliness and purity. Moreover, the parks and gardens indicate that the urban landscape is carefully designed to have both residential and recreational spaces, not unlike More's garden-state. It is possible that Wyndham, who is trying to make a political point about nuclear weapons with his book, is content with the urban geography of the mid-1900s. His warning, then, is that a nuclear disaster could cause us to "devolve" into a more agricultural, puritanical and less secure society such as his post-nuclear Waknuk, Labrador. Like Labrador, New Zealand is isolated and was, therefore, spared total destruction. However, it is taking better advantage of its isolation. Instead of resisting the genetic changes brought about by radiation, Sealanders hope that thinking together through telepathy can enable them to create a better world.

There are still several unsettling aspects about their society. First, when the Sealanders come to rescue David, Rosalind and Petra, they use a lethal weapon that is disturbingly deadly and effective. This weapon consists of wispy white strands that the Sealanders release from their airship. The strands wrap and entangle those on the ground, eventually suffocating them. David comments: "There was an unnerving quality about it – something quite different from the fatal issue of a man-to-man fight…" (195). The distance between those who deploy the weapons and those

who are affected by it could perhaps be compared to the deployment of nuclear weaponry. Both are detached ways to dispatch an enemy. Neither requires the deployer to look the victim in the face.

Also disquieting is how easily the Sealand woman dismisses the deaths. Throughout their contact with her, David and Rosalind feel that she is "condescending" (158). When she arrives, the reason for her cold, indifferent nature towards those who are not telepathic becomes evident; she views them as another species. She says: "…ours is the superior variant, and we are only just beginning. We are able to think-together and understand one another as they never could…" (196). In a way, the "inferiority" of most people in Labrador and their unwillingness to accept evolution justifies their deaths in her mind. She has a similar rationalization for the deaths of the Fringes people caught in the weapon: "the unhappy Fringes people were condemned through no act of their own to a life of squalor and misery – there could be no future for them." Interestingly, the Sealanders do not consider rescuing non-telepathic people and bringing them to Sealand; all other "species" of human are left to suffer. Therefore, just as Waknuk residents only accept one form of human, so too are Sealanders elitist and more accepting of one form than of others. Of the three communities described in the book – the fundamentalist Waknuk, the Fringes settlement and the Sealand city, the last will appeal most to readers. However, Wyndham allows us to glimpse enough imperfection in the society that an astute reader will question whether even it is utopia fulfilled.

Conclusion

Whether a utopia is static or kinetic, boundaries are important to its existence. The four main works discussed in this paper illustrate that fact. Boundaries help residents have the choice of which, if any, changes from the outside they will adopt. Even with protective boundaries, some societies discussed in this paper quite readily accepted certain changes, such as useful technology from other societies. These are examples of the kinetic possibilities in utopia – a further "improving" of an already utopian existence. Few literary utopias exist that are not protected from unwanted contamination by barriers. Suggest Lukermann and Porter (1976): "Whether a utopia is fictional or realized, it requires conditions of stability, not an environment of change, in order to flourish. Literary utopias ensure this through isolation" (201). However, Lukermann and Porter could have recognized that kinetic utopias also exist. In addition, not all change in

utopias is undertaken willingly by all residents; sometimes, dystopian elements that are evident to the reader are solved in some way, such as when Jonas leaves his community in *The Giver*. After he leaves, the community is changed back to a feeling and, therefore, hurting community. Jonas has broken through the geographic barrier and ended their utopia. However, he can improve his own life and stop living in pain.

Utopian literature has changed over time; the idea of the kinetic was consciously introduced by Wells in 1905 and dystopian themes became increasingly common in the 20th century; while More's *Utopia* only faintly suggests some citizens might be unhappy, the other three works considered in this paper have characters that very obviously find their circumstances hellish. Control is present in all of the books discussed in this essay – that by a lamasery in *Lost Horizon*, by tradition and elders in *The Giver* and by fundamentalists in *The Chrysalids.* Key questions raised in all of these books include: "how much freedom should be relinquished in order to attain utopia?" and "can a utopia even exist without freedom of choice?" Geography is linked to these subdued freedoms because the isolation provided by geography helps enable this control.

In addition, the frontiers of literary utopias have shifted over time to accommodate a world that was becoming increasingly mapped and understood. Explain Lukerman and Porter (1976), "As European empires expanded in scope and power, the utopias did too; and since utopists were running out of places to put their imaginary worlds, they had to go underground or resort to outer space or future times" (207). *The Giver* and *The Chrysalids* are examples of books in which writers chose settings in the future. Despite the expanding reach of the human race, isolation in utopian societies (which are often also dystopian, depending on perspective) has proven persistent over time; this telling trend holds true with the four works under study in this essay. As the oceans of More's *Utopia* were charted, writers shifted their Edens to other isolated locations, such as Hilton's Shangri-La or to the future, as Wyndham and Lowry have done, thus demonstrating that geographic isolation may be as important to societies striving for utopia as any social, economic or political factors. Eden can never be found for, unlike the apple of knowledge, it is forever just outside our grasp.

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(Footnotes)

[1] In Lowry 's sequel, *Messenger* (2004), we learn that Jonas survived and joined a much different community in which he is happier.

Investigating the Prairie Pothole Region of north central North Dakota: Field Trip Guide

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Mile 0.0

Intersection of U.S. Hwy 281 and U.S. Hwy 2 in Rugby. A large monument SE of the intersection marks Rugby as the "Geographical Center" of North America. According to the U.S. Geological Survey, the approximate center of the North American continent is 6 miles west of Balta, ND (south of Rugby) at 48° 10' N and 100° 10' W (USGS 2006). You are driving across thin gravels over bedded lake (lacustrine) sediments deposited from Late

Wisconsinan age Glacial Lake Souris. These sediments belong to the Coleharbor Formation of glacial drift deposits (Bluemle 1988). The field trip will take you through Pierce and Benson Counties that are situated in the Central Lowland physiographic province. Rugby is also not far from a monument to the British geographer David Thompson (1770-1857), who mapped much of the area while working for the North West Company (Snortland 2002). The monument is located in the town of Karlsruhe.

Mile 2.0

This low relief area consists of laminated silt and clay lacustrine deposits.

Mile 9.0

Stop 1. -Pleasant Lake Highway Rest Area. The lake just to the north of Highway 2 is Broken Bone Lake. This area is gently rolling, with steep walled kettle lakes. Notice all of the trees to the north of the lake. The lake is fed by several springs that flow from the Pleasant Lake Aquifer. The lake is partially formed by a rock dam that was installed in 1937 at the south end of the lake. The Pleasant Lake Aquifer supplies water for the towns of Rugby and Leeds, and for 90 acres of irrigation. The aquifer thins in this area, causing higher water levels. The aquifer consists of four major units and is a surficial aquifer composed of mostly fine to coarse sand with some silt and clay beds. The aquifer extends for about 11 square miles (Pusc and Cline 2002).

Mile 15.0

The town of Knox was founded in 1883 in Sections 8 and 17, Knox Township; and was incorporated as a village in 1906. There are two versions to the origin of the town name. 1) Knox was named by H.T. Ober, a Great Northern R.R. townsite agent for Maj. General Henry Knox, Secretary of War 1785-1795. 2) The township and village were named by Canadian settlers for John Knox, a Scottish religious reformer (Wick 1988). A peak population of 330 was reported in 1910, with a steady decline to just 59 by 2000. Knox is the hometown of UND's current head football coach Dale Lennon. The area surficial geology consists of low relief ice stagnation deposits consisting of boulders, cobbles, pebbles and sand in a silt and clay matrix (Carlson and Freers (1975).

Mile 20.0

The town of York was initially established by the Great Northern Railroad as a station in 1883. The town was originally named Willson's Siding after George P. Willson, an early homesteader and owner of the site. Willson was a pioneer railroad man and the first to establish a home at this station.

When the railroad reached here in 1886, it was renamed York, by James J. Hill, railroad magnate, after York, England (Wick 1988). The village did not incorporate until 1954, and while the population was once in excess of 300, the 2000 population was 26.

Mile 24.0
Look for the elk/wild game farm at mile post 234 just south of the highway.

Mile 25.0
Look for North Dakota State University Agricultural Experiment farm at mile post 235.

Mile 26.0
The town of Leeds was established in 1884 on Sections 31 and 32, Leeds Township, at the junction of the Great Northern and Northern Pacific railroads. Leeds is named after the manufacturing city and borough of the same name in Yorkshire on the Aire River, England. Leeds incorporated as a village in 1899; then as a city in 1903. The peak population was reached in 1960 at about 797. Today the town has over 50 businesses and 350 homes, a grade school and high school (Wick 1988). The population is about 464 as of 2000. Golden Plains Frozen Foods, located in Leeds, is an excellent example of value-added agriculture on this region's landscape. Since 1999, this business has been producing specialty filled-pasta products that range from Prosciutto Asparagus Ravioli to a classic Cheese Tortellini, 43 in all, in their 46,000 square foot factory. Primary customers are casual to upscale restaurants, and larger-scale dining operations such as hotels and campus facilities. The company also is market-conscious in their efforts to incorporate whole grain pasta, satisfying "low-carb" demand. In addition, Golden Plains Frozen Foods makes nine different sauces that form the majority of their business. They are attempting to penetrate the market at a lower level through large retail-chain stores and restaurants. CEO Ron Hofstrand cites the company's success having a direct relation to their geographic region. Access to raw materials, midway between the coasts, and available labor combined with low property taxes and production costs, help the chances that we will see their "Zalvina" brand in stores soon (Krapp 2006; Golden Plains Foods 2006). Many low washboard moraines are visible to the north of Leeds.

Mile 33.0
BTR Farmers Co-op elevator near mile post 243 was relocated from the Churchs Ferry area due to flooding from Devils Lake and Mauvais Coulee.

Mile 37.0

Intersection of old U.S. Hwy 281 and U.S. Hwy 2. Continue traveling east for another 2 miles and turn north on U.S. Hwy 281 and then east into Churchs Ferry.

Mile 39.0

Rolling Stop 2. –Churchs Ferry. The town of Churchs Ferry was affected by rising water from Mauvais Coulee, that threatened the city's sewage lagoons, and from Devils Lake, that were about to inundate a low spot along U.S. Hwy 2. In fall 1999, the town filed an application for the federal Hazard Mitigation Grant Program. This program provided $3.5 million for the voluntary buyout of residences, with 75% of funds coming from the federal government, and 25% from state and local dollars. All but two of the 42 occupied homes in town (113 population) elected to participate. The surrounding communities of Devils Lake and Leeds offered inducements to attract residents, such as reduced costs for lots, tax breaks, and utility credits. The BTR Farmers Co-op elevator (15 full-time employees) was relocated to Leeds under another federal program. Individual structures were auctioned off, relocated, or demolished, and the town was dissolved.

Mile 41.0

Return to intersection of old U.S. Hwy 281 and U.S. Highway 2, and travel 2 miles west to U.S. Hwy 281 south. Drive south towards Minnewaukan. The road has rip rap to protect it from waves breaking over the sides. Boulder and clay till and washboard moraines dominate the areas not flooded by the rising Devils Lake.

Mile 59.0

Stop 3. -Minnewaukan. Take a left turn from 281 onto Main Street and right at the water tower to stop at high school football field. Minnewaukan, the Benson County seat, has a population of about 400 persons. In 1993 the lake was about 8 miles from city's edge, and was separated from the lake by the Minnewaukan Flats. In fall 1995, a new sewage lagoon was completed at an elevation of 1,464' and a cost of $800,000. Funds came from the USDA Rural Development Program ($370,000) and a loan approved by the ND Industrial Commission from the ND State Municipal Bond Bank ($430,000, 20 years at 3% interest). The old lagoon (1,436') was lost in the spring of 1996 to the rising lake. A total of $7 million has been spent to raise a 6-mile stretch of U.S. Hwy 281 and ND Hwy 19 north of town. Another $2 million in federal money has been used to improve or repair the town's road and sewer system from high groundwater levels. U.S. Hwy

281 will be flooded at an elevation of 1,451 ft., and is being relocated to a new site west of town. About a dozen families have already been forced to move due to the rising waters, and others are seeking a federal Hazard Mitigation Grant Program buyout and will relocate to higher ground. At a lake water surface of 1,463 ft. all but three town blocks would be flooded, so the town faces an uncertain future.

Mile 60.0

Drive south on C Avenue and take a right on ND Hwy 19. The highway crosses a large esker about 1 mile west of Minnewaukan. Drive for 12 miles to ND Hwy 30.

Mile 70.0

ND Hwy 30 climbs onto the North Viking end moraine.

Mile 72.0

Turn right (north) on ND Hwy 30 and drive for 9 miles to the town of Harlow. The road crosses some gravel outwash deposits about 2.5 miles north of ND Hwy 19 and then back onto bouldery clay till and the North Viking end moraine.

Mile 79.0

Stop 4. –Harlow. Harlow is a typical community among the ever-increasing number of declining hamlets and villages in the Prairie Pothole region of North Central North Dakota. According to Wick (1988: 86), the Soo Line Railroad stimulated the establishment of a farm service center here in 1912 although there had been homesteading in this part of Benson County starting in 1896. Being on the route of the east-west railway line created by the Soo Line Railroad to siphon traffic from the trade hinterland of the Great Northern Railroad, the community temporarily blossomed as a consequence of what Hudson (1985) has noted as the railway wars between these two corporations for control of the grain traffic. Never incorporated, Harlow apparently peaked in population with about 100 people, but the exact date is not cited by Wick (1988:86), the key source of the historical geography of North Dakota toponymns. It can be speculated by geographers that the aforementioned number of people probably was reached sometime between 1920 and 1970 because the village merited a zip code for its post office. This is quite likely seeing as how Tweton and Jelliff (1976) have noted the rise and decline of rural areas during that time period. Unfortunately for the farmers and villagers but particularly the postmistress who had been in charge of the facility starting in 1944, the federal government closed the post office in the winter of 1978 with postal

service being directed through Leeds (Wick 1988:86). Now the Soo Line Railroad is a subsidiary of the Canadian Pacific, but continues to offer grain shipping services at Harlow. The traffic is handled at the site of the Harlow Cooperative Elevator, a facility with a 1,500,000 bushel capacity and siding sufficient to accommodate 50 freight cars (Canadian Pacific 2006). As with so many Prairie Pothole hamlets and villages in North Central North Dakota, the future of Harlow is dependent upon whether it can maintain a railway connection. If not, there is a greater likelihood than not that Harlow will join the ever-growing number of quasi-ghost towns in this part of the Peace Garden State. Harlow is just east of the North Viking end moraine.

Mile 80.0
Leave Harlow and continue driving north on ND Hwy 30 to U.S. Hwy 2.

Mile 81.5
ND Hwy 30 crosses outwash gravel deposits as the road makes a sharp left.

Mile 82.4
Old school house near Mud Lake.

Mile 86.2
ND Hwy 30 crosses a gravel kame/esker deposit. Several other kame/esker features are visible from the highway, and have been used for gravel mining operations.

Mile 89.0
U.S. Hwy 2, turn left (west) and travel towards York and Knox.

Mile 96.7
In Knox, watch for signs of Dakota Hills Winery. Turn left on 43rd Ave NE (gravel road) and drive for 3 miles to 61st Street NE

Mile 99.7
Turn right (west) on 61st Street NE and drive for 3 miles to 40th Ave NE.

Mile 102.7
Turn left (south) on 40th Ave NE and drive for 0.7 miles to Dakota Hills Winery. The road follows the North Viking end moraine.

Mile 103.4

Stop 5. -Dakota Hills Winery. Resting on 25 acres of aesthetically pleasing hills and lakes near Knox, the Dakota Hills Winery is doing well after passing the four-year mark. Operated by Brian Cochran and his wife, 40 to 50 pounds of wild grapes, plums, June berries, Saskatoon berries, raspberries, cherries, and niche-market (Norwegian) Josta berries are being harvested daily. The winery is actively involved with the community through activities like fund raising for the Fire Department. They are looking to expand to outlet centers in Fargo, Bismarck and Minot and are online. The winery is situated on the North Viking end moraine. The moraine consists of stagnate ice deposits and circular disintegration ridges are common (Carlson and Freers 1975).

Mile 103.4

Leave Dakota Hills Winery and travel north on 40th Ave NE to 66 St. NE.

Mile 105.0

Turn left (west) on 62 St. NE and drive for 1.5 miles.

Mile 106.5

Turn right (north) on 39th Ave NE and drive for 2 miles to U.S. Hwy 2.

Mile 108.5

Turn left (west) on U.S. Hwy 2 and drive 3.5 miles to Rugby.

Mile 112.0

Rugby.

Pierce County General Data:

Pierce County occupies 1,018 square miles and had an approximate population of 4,291 in 2005, which is a 8.2% decrease from the 2000 Census total of 4,675. 98% of the population is White and overall there is a median age of 42.9 years. Almost 25% of the population is 65 or older. 11% of the population was below the poverty line in 2003. Cities in this county include Rugby, Balta and Wolford. The average size of a farm in Pierce County is 1,090 acres, 89% of which are operated by a family or an individual and yield an average crop value of $86.80 per acre. 4,915 acres of corn were harvested, 9,439 acres of soybean, and 117,405 acres of wheat for grain.

Benson County General Data:

Benson County takes up 1,381 square miles and had a 2005 population of 6,999, which is an overall increase of 0.5% from the 2000 Census count of 6,964. Only about half (49.5%) of the population is White, while Native Americans comprise 49.8% of the population in Benson County. 33% of the population is under 18 years old and 22.5% of the population is considered to be living below the poverty line. The median age in Benson County is 31.4 years. The average size of a farm here is 1,293 acres with almost 94% of them operated by a family or individual and the average crop-value is $103.98 per acre. 20,341 acres of corn were harvested, 21,690 acres of Soybean, and 145,026 acres of wheat for grain.

North Dakota General Data:

Occupying 70,703 square miles, North Dakota is the 17th largest State in the Union, yet only the 48th in population with a total of 642,200 in the 2000 Census, which is now down 0.9% to an estimated 636,677. 92.4% of the State's population is White, with the largest minority being Native American and comprising over 5% of the population. The median age is 36.2. North Dakota's farm holdings totaled $2.98 billion in 2001. Typically, North Dakota is the number one producer of hard spring wheat, durum wheat, sunflowers, barley, oats, flax, all dry edible beans, and pinto beans. In 2002, North Dakota led the nation in spring wheat, drum wheat, barley, dry edible beans, sunflowers, and was 2nd in the nation in overall wheat production. The total number of farms has declined over the years as the average size of farming operations has increased. In 2002, the state had approximately 30,000 farms and ranches occupying 39.4 million acres (16 million hectares) and producing 216.6 million bushels of wheat, 57.0 million bushels of barley, 1.71 billion lb of sunflowers, 12.7 million bushels of oats, 10.6 hundredweight of dry edible beans, 114.4 million bushels of corn, 4.8million tons of sugar beets, and 23.5 million hundredweight of potatoes. The average farm is 1,313 acres (531 hectares).

2000 Census Data and www.city-data.com

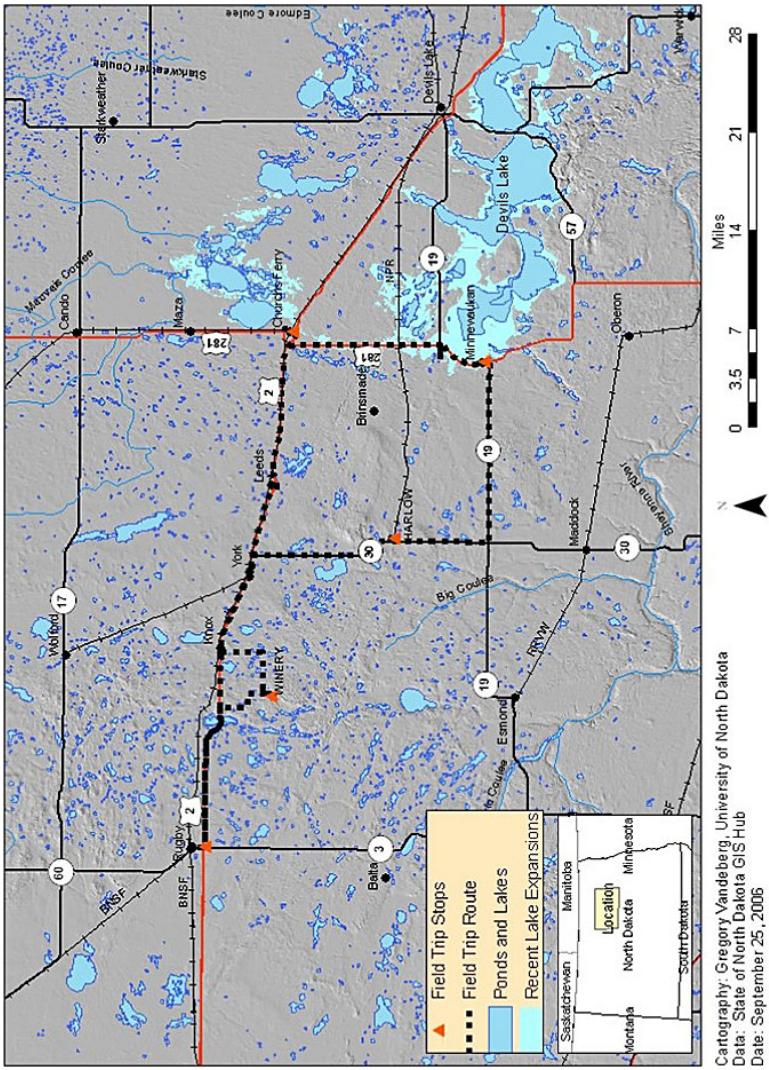

Figure 1: *Field trip route.*

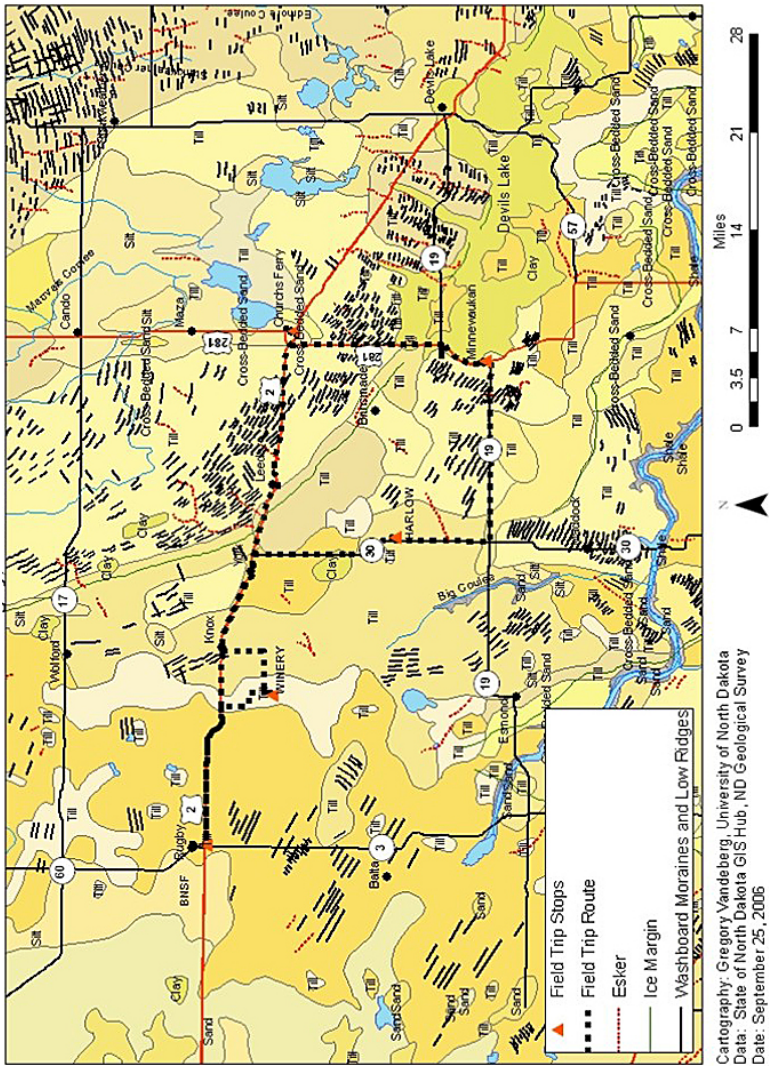

Figure 2: *Simplified surficial geology. Units are members of the Quaternary Coleharbor Formation.*

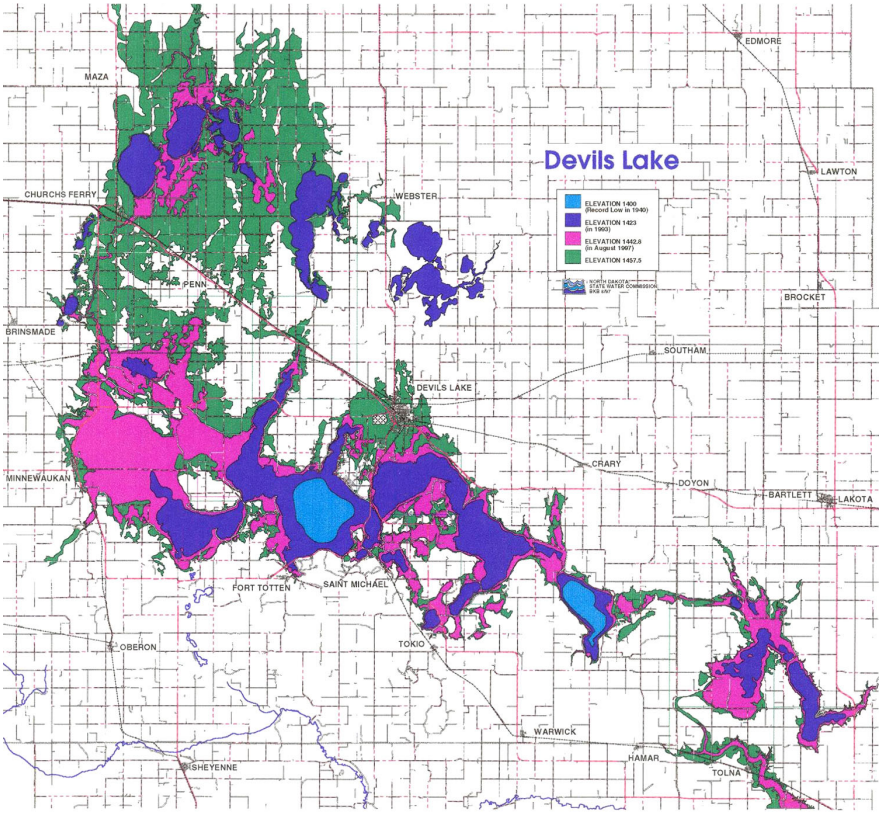

Figure 3: *Devils Lake changes since 1940.*

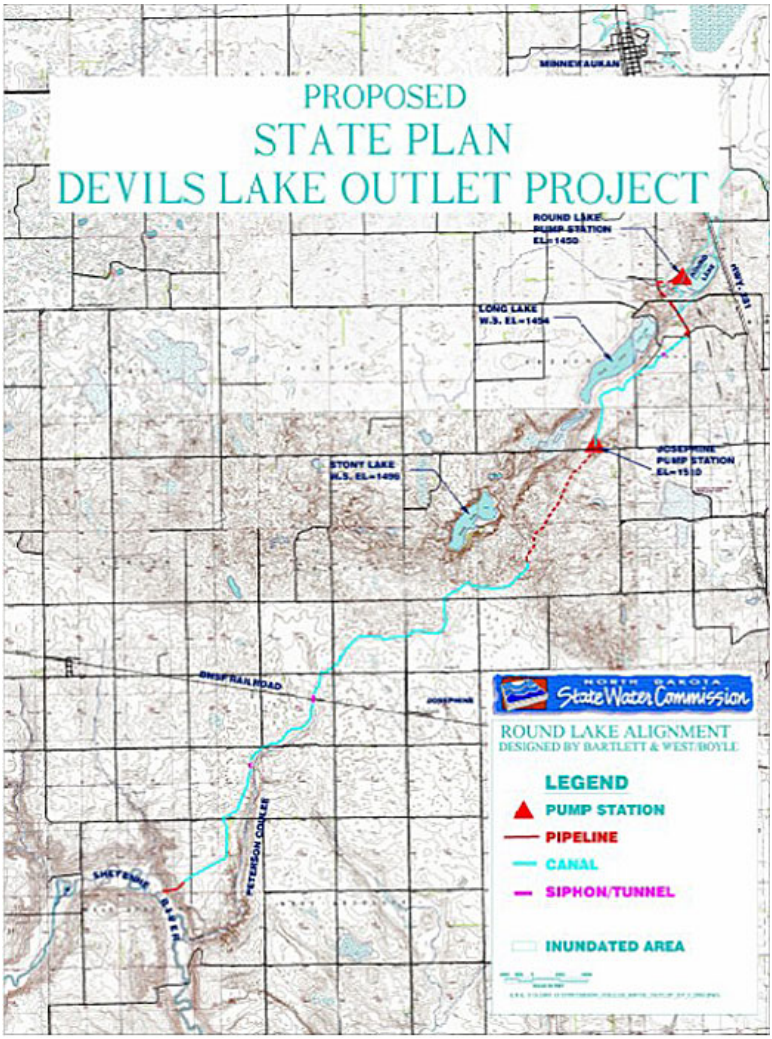

Figure 4: *Map of installed outlet as of September 2005 (http://www.swc.state.nd.us/4dlink9/4dcgi/GetContentPDF/PB193RoundLakeAlignmentMap.pdf)*

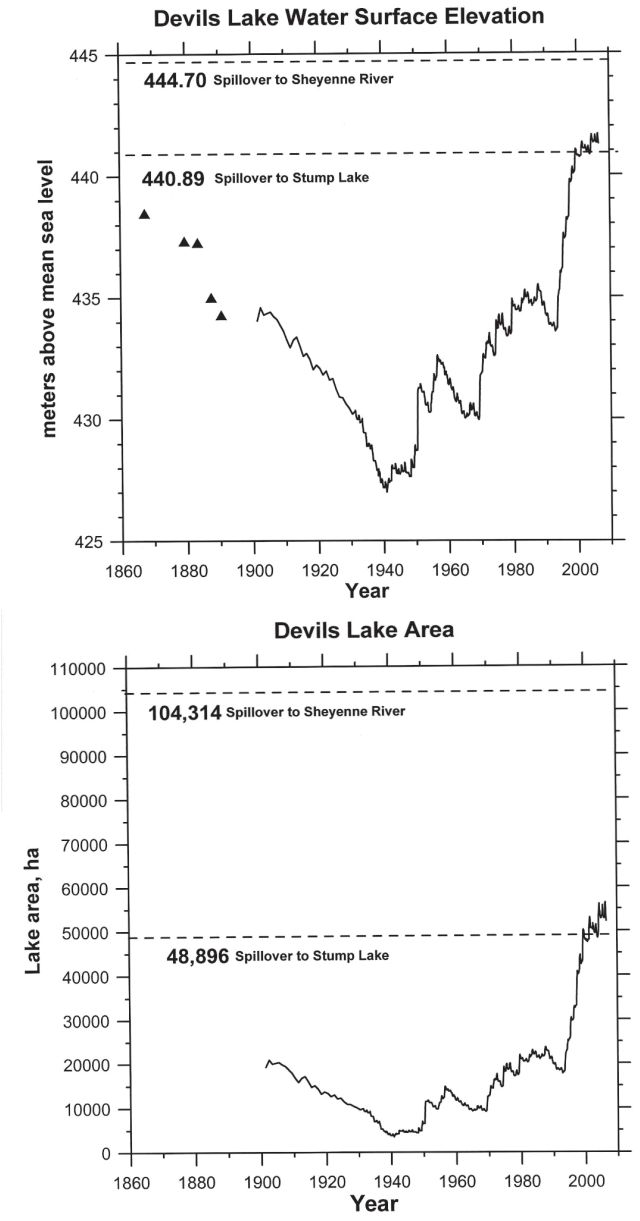

Figure 5: *Changes in Devils Lake water level and total area.*

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